

Chapter 1: An Introduction to Finance

Multiple Choice Questions

Section 1.1 – Real versus Financial Assets

1. Which of the following items is not a real asset?

- A. Land
- B. Television
- C. Bond
- D. Gold mine

Answer: C Type: Definition Level of Difficulty: Easy LO: 1.2

2. Of the following list, which item is a financial asset?

- A. Land
- B. Bond
- C. Building
- D. Inventory

Answer: B Type: Definition Level of Difficulty: Easy LO: 1.2

3. What is the main difference between real assets and financial assets?

- A. Real assets are tangible and financial assets are intangible.
- B. Real assets have known values, while the values of financial assets are not known.
- C. Real assets are intangible and financial assets are tangible.
- D. Real assets have unknown values, while the values of financial assets are known.

Answer: A Type: Definition Level of Difficulty: Easy LO: 1.2

4. If Canadian households, in aggregate, own real assets with a market value of \$3.194 trillion, and also own net financial assets with a market value of \$2.344 trillion, the total net assets of Canadian households have a market value of:

- A. 3.194 trillion
- B. 5.538 trillion
- C. -0.850 trillion
- D. 0.850 trillion

Answer: B Type: Calculation Level of Difficulty: Easy LO: 1.2

How the answer was determined:

$$5.538 \text{ trillion} = \$3.194 + \$2.344$$

5. Given the following hypothetical information regarding the real and financial assets in Canada for 2008 (numbers in \$ billions):

	Real Assets	Net Financial Assets
Government	677	-658
Business	2,202	-1,635
Households	3,194	2,344

What is the total value of the net real assets in Canada for 2008?

- A. \$5,842 billion
- B. \$6,086 billion
- C. \$6,124 billion
- D. \$6,105 billion

Answer: C Type: Calculation Level of Difficulty: Medium LO: 1.2

How the answer was determined:

$$\$6,124 \text{ billion} = 677 + 2202 + 3194 - 658 - 1635 + 2344$$

6. You are provided with the following hypothetical information regarding the real and financial assets in Canada for 2008 (numbers in \$ billions):

	Real Assets	Net Financial Assets
Government	677	-658
Business	2,202	-1,635
Households	3,194	2,344

What is the value of the net financial assets owned by *non-residents* for 2008?

- A. \$901 billion
- B. \$709 billion
- C. \$2293 billion
- D. There is not enough information to answer the question.

Answer: A Type: Calculation Level of Difficulty: Difficult LO: 1.2

How the answer was determined:

$\$901 \text{ billion} = 3194 - 658 - 1635$. The value of net financial assets held by non-residents is equal to the negative of the sum of the net financial assets of government, businesses, and households.

7. Which of the following sectors is the primary source of savings in the economy?

- A. Business sector
- B. Household sector
- C. Government sector
- D. Banking sector

Answer: B Type: Concept Level of Difficulty: Easy LO: 1.2

Section 1.2 – The Financial System

8. Entities that invest funds on behalf of others and change the nature of the transactions are called:

- A. Brokers
- B. Financial intermediaries
- C. Dealers
- D. Market intermediaries

Answer: B Type: Definition Level of Difficulty: Easy LO: 1.3

9. Joe has just borrowed \$5,000 from his aunt in order to make a down payment on a car. This borrowing transaction is an example of:

- A. Indirect intermediation
- B. Direct intermediation
- C. External intermediation
- D. Market transaction

Answer: B Type: Definition Level of Difficulty: Easy LO: 1.3

10. An example of direct intermediation would be:

- A. An individual borrowing money from a bank
- B. An individual borrowing money from her mother
- C. An individual using a real estate broker to finance her home purchase
- D. A stockbroker selling securities to an individual

Answer: B Type: Concept Level of Difficulty: Easy LO: 1.3

11. The three intermediation channels which transfer money from lenders to borrowers are:

- A. Direct, indirect, and financial intermediation
- B. Direct, indirect, and monetary intermediation
- C. Direct, financial, and monetary intermediation
- D. Indirect, financial, and monetary intermediation

Answer: A Type: Definition Level of Difficulty: Easy LO: 1.3

12. Although Canadian banks are involved in almost all areas of the financial system, which of the following is their core activity?

- A. Stock market investment activity
- B. Retirement planning
- C. Wealth management
- D. Taking deposits and lending funds

Answer: D Type: Definition Level of Difficulty: Easy LO: 1.3

13. Which of the following is *not* a financial intermediary?

- A. Chartered banks
- B. Insurance companies
- C. Pension funds
- D. Mutual funds

Answer: D Type: Definition Level of Difficulty: Easy LO: 1.3

14. Which of the following is *not* one of the main functions performed by mutual funds?

- A. Pooling sums of money to make investments
- B. Paying out premiums to their clients
- C. Providing professional management expertise
- D. Acting as a “pass-through” for individuals to invest in the equity and debt markets

Answer: B Type: Concept Level of Difficulty: Medium LO: 1.3

15. What is the major proportion of Canadians' wealth?

- A. Stocks and bonds
- B. Real Assets
- C. Durable goods

D. Claims on retirement and insurance funds

Answer: D Type: Concept Level of Difficulty: Easy LO: 1.3

16. In 2008, the Canadian government owes 28.6 percent of its GDP in debt to whom?

- A. Crown corporations
- B. Multinational firms
- C. Canadian households and Corporations
- D. World Bank

Answer: C Type: Concept Level of Difficulty: Easy LO: 1.3

17. In Figure 1-1, how do you explain the negative difference between the value of real assets and the financial assets of Canadian corporations and crown corporations?

- A. Real assets are always less than financial assets
- B. Canadian debt financed the difference
- C. Claims to retirement funds
- D. The 2008–09 financial market crash

Answer: D Type: Concept Level of Difficulty: Medium LO: 1.3

Section 1.3 – Financial Instruments and Markets

18. Financial markets are usually classified by the type and maturity of the financial assets traded. The two main classifications are as follows:

- A. Bond market and money market
- B. Money market and capital market
- C. Bond market and foreign-exchange market
- D. Commodity market and capital market

Answer: B Type: Definition Level of Difficulty: Easy LO: 1.4

19. Of the following list, who are the dominant players in the money market?

- I. Individuals
 - II. Corporations
 - III. Governments
- A. I and II
 - B. I and III
 - C. II and III
 - D. I, II and III

Answer: C Type: Definition Level of Difficulty: Easy LO: 1.4

20. All common shares are comprised of which two components?

- A. Ownership and voting rights
- B. Ownership and dividend rights
- C. Voting and dividend rights
- D. Dividend and yield rights

Answer: A Type: Concept Level of Difficulty: Easy LO: 1.4

21. Though they are classified as equity, why are preferred shares also similar to debt?

- A. Both carry the same interest rate.

- B. Dividends on preferred shares must be paid out before any common share dividends.
- C. The voting structures for preferred shares and debt are equivalent.
- D. Preferred shares have similar maturity structures to debt.

Answer: B Type: Concept Level of Difficulty: Difficult LO: 1.4

22. Which of the following is not a component of debt securities?

- A. Maturity
- B. Repayment
- C. Dividends
- D. Interest payments

Answer: C Type: Definition Level of Difficulty: Easy LO: 1.4

23. An example of a non-marketable financial asset is a:

- A. Demand deposit
- B. T-Bill
- C. Commercial paper
- D. Common share

Answer: A Type: Definition Level of Difficulty: Easy LO: 1.4

24. How do governments obtain the majority of their short- and long-term financing?

- A. T-Bills and Canada Savings Bonds
- B. T-Bills, traditional bonds, and Canada Savings Bonds
- C. T-Bills, equity, and traditional bonds
- D. Traditional bonds and Canada Savings Bonds

Answer: B Type: Concept Level of Difficulty: Easy LO: 1.4

25. Which of the following is *not* an example of a capital market security?

- A. Bond
- B. Debenture
- C. Common equity
- D. T-Bill

Answer: D Type: Definition Level of Difficulty: Easy LO: 1.4

26. Which of the following is an existing stock exchange in Canada?

- A. Toronto Stock Exchange (TSX)
- B. Montreal Exchange (ME)
- C. Vancouver Stock Exchange (VSE)
- D. Winnipeg Stock Exchange (WSE)

Answer: A Type: Definition Level of Difficulty: Easy LO: 1.4

27. Which of the following was *not* one of the major objectives in the restructuring of the Canadian stock exchanges in 1999 and 2000?

- A. To create a Canadian market for NASDAQ-listed companies.
- B. To combine all futures and options trading on one exchange.
- C. To make the TSX the official exchange for the trading of Canadian senior stocks.
- D. To create a single national exchange for trading in junior company stocks.

Answer: A Type: Concept Level of Difficulty: Medium LO: 1.4

28. A market where transactions are made directly between large institutions and wealthy individuals that bypass brokers and dealers is an example of:

- A. The primary market
- B. The secondary market
- C. The third market
- D. The fourth market

Answer: D Type: Definition Level of Difficulty: Easy LO: 1.4

29. The main difference between exchanges and dealer/OTC markets is:

- A. Exchanges are a part of the primary market, while dealer and OTC markets are part of the secondary market.
- B. Transactions in dealer markets are conducted entirely by humans, not electronically.
- C. Exchanges have a physical location while dealer and OTC markets do not.
- D. All of the above are differences between exchanges and dealer markets.

Answer: C Type: Concept Level of Difficulty: Easy LO: 1.4

30. The exchange that acts as the Canadian national derivatives market and conducts all options and futures trading is called the:

- A. Bourse de Montreal
- B. Winnipeg Commodity Exchange
- C. Toronto Stock Exchange
- D. Canadian Trading and Quotation System Inc.

Answer: A Type: Definition Level of Difficulty: Easy LO: 1.4

31. Which is the only province where trades in unlisted securities need to be reported?

- A. British Columbia
- B. Quebec
- C. Alberta
- D. Ontario

Answer: D Type: Definition Level of Difficulty: Easy LO: 1.4

32. Which one of the following is not a function of brokers?

- A. Manage money for clients
- B. Make the market work
- C. Charge a fee for their services
- D. Assist with the transaction process

Answer: A Type: Concept Level of Difficulty: Easy LO: 1.4

33. What was **not** a reason for the credit crunch of 2008-09?

- A. Mistrust between financial intermediaries
- B. Illiquidity of debt markets
- C. The arrest of Bernard Madoff
- D. Bankruptcy of one of the leading financial institutions

Answer: C Type: Concept Level of Difficulty: Easy LO: 1.4

34. Who are the biggest borrower and lender in Canada respectively?

- A. Government and households
- B. Government and banks
- C. Banks and mutual funds
- Crown corporations and banks

Answer: A Type: Concept Level of Difficulty: Easy LO: 1.4

35. Why can't the Canadian government issue equity?

- A. Because assets belong to all Canadians
- B. It is not listed in the financial markets
- C. It has too much debt
- D. Because expenditures exceed revenues

Answer: A Type: Concept Level of Difficulty: Medium LO: 1.4

36. If the stock of a listed firm decreases by 50 percent what does it mean to the stock holders?

- A. Their ownership of the firm will decrease by 50 percent
- B. Total value of their holdings decreases by 50 percent
- C. The debt of the firm decreases by 50 percent
- D. Nothing

Answer: B Type: Concept Level of Difficulty: Medium LO: 1.4

Section 1.4 – The Global Financial Community

37. Which of the following is *not* a benefit of global financial markets?

- A. They represent important sources of funds for borrowers.
- B. They provide diversification benefits to Canadian investors.
- C. Canadian companies can list their shares in different markets.
- D. The value of Canadian shares becomes more stable.

Answer: D Type: Concept Level of Difficulty: Easy LO: 1.5

38. Which is the world's largest and most famous stock market?

- A. New York Stock Exchange (NYSE)
- B. Toronto Stock Exchange (TSX)
- C. Tokyo Stock Exchange (TSE)
- D. London Stock Exchange (LSE)

Answer: A Type: Definition Level of Difficulty: Easy LO: 1.5

39. The spread of the financial crisis in the autumn of 2008 was **not** augmented by:

- A. Linkages between global financial markets
- B. The cross listing of firms in different markets
- C. The consolidation of the global financial system
- D. Excessive debt of the government

Answer: D Type: Concept Level of Difficulty: Medium LO: 1.5

40. What is a 'Ninja' loan?

- A. Mortgage to individuals with poor credit

- B. Mortgage with unknown rates
- C. Mortgages to individuals with good credit
- D. Mortgages backed by unspecified assets

Answer: A Type: Definition Level of Difficulty: Easy LO: 1.5

Practice Problems

41. How do financial intermediaries help those with “too much money today” and those with “not enough money today”?

Type: Concept Level of Difficulty: Medium LO: 1.4

Suggested answer:

Financial markets provide these surplus- and deficit-spending units with a way to improve their respective situations. Deficit-spending units do not have to postpone profitable investments today, and surplus-spending units can hold financial securities that generate a return. More importantly, financial markets provide a framework that facilitates the “meeting” of these two parties. Financial markets accelerate, simplify, and reduce the cost of contact between borrowers and lenders.

42. What are the differences between the primary markets and the secondary markets?

Type: Concept Level of Difficulty: Easy LO: 1.4

Suggested answer:

The primary market is where a borrower issues new securities and exchanges these securities for cash from investors. The proceeds of the sale of securities in the primary market go to the issuing corporation or government.

In secondary markets, investors trade already issued securities with other investors. Securities may trade repeatedly in the secondary markets, but the original issuers will be unaffected in the sense that they will not receive any additional cash from these transactions.

43. Why is the secondary market important?

Type: Definition Level of Difficulty: Medium LO: 1.4

Suggested answer:

The secondary market is where investors trade already issued securities. It is important because it provides liquidity to investors. If an efficient secondary market did not exist, investors would be very reluctant to hold securities with longer maturities. If they are not willing to buy these securities, then securities in the primary market will become more difficult to sell. Hence, the secondary market is necessary for the proper functioning of the primary market.

44. What is an over-the-counter market? Do all bonds in Canada trade over-the-counter?

Type: Concept Level of Difficulty: Easy LO: 1.4

Suggested answer:

“Over-the-counter” means a large network of dealers make markets in various securities, both debt and equity. The market doesn’t have a physical location but instead consists of a network of dealers who trade with each other over phone or computer networks. Investors can buy and sell with their brokers who then trade with other dealers.

The majority of bonds in Canada trade over-the-counter, although some bonds trade on stock exchanges such as the Toronto Stock Exchange (convertible bonds only) and the Canadian Venture Exchange.

45. Explain what an auction market is and how it works.

Type: Definition Level of Difficulty: Easy LO: 1.4

Suggested answer:

Stock exchanges are auction markets. Brokers act on behalf of their clients and arrange to match buyers and sellers through an auction system. Trading takes place either on the floor of an exchange or by computer link. For their services, brokers charge a commission that is a percentage of the value of the transaction.

46. Define and describe the difference between the third and fourth markets.

Type: Definition Level of Difficulty: Easy LO: 1.4

Suggested answer:

The third market is an OTC market for the trading of securities that are listed on organized exchanges. The fourth market refers to transactions made directly between large institutions and/or wealthy individuals, thereby bypassing brokers and dealers.

The difference between the third and fourth market:

The third market involves extremely large transactions and is used primarily to avoid exchange commission fees. The fourth market involves relatively smaller trades and is used to avoid information leaks regarding who is trading which stock(s).

47. Explain the gravity of the situation of pension holders in Quebec after the loss of 25 percent of the caisse de depot's portfolio (pension fund manager of Quebec) in 2008.

Type: Concept Level of Difficulty: Difficult LO: 1.5

La caisse de depot is the manager of pensions in Quebec. The loss of 25 percent of its portfolio represents the loss of funds available to pay pensions. In order to keep the same level of payment of pensions promised to pensioners, the contributions have to be increased or the province has to contribute from its own money to increase the level of funds.

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Chapter 2: Business (Corporate) Finance

Multiple Choice Questions

Section 2.1 – Types of Business Organizations

1 Which of the following is **not** a reason for incorporating a business?

- A. Limited liability
- B. Ownership is relatively easy to transfer
- C. It is easier to form than a proprietorship
- D. Corporate tax laws may allow tax deferral or avoidance

Answer: C Type: Concept Level of Difficulty: Easy LO: 2.1

2. Which of the following is **not** a form of business organization?

- A. Corporation
- B. Sole partnership
- C. General partnership
- D. Sole proprietorship

Answer: B Type: Definition Level of Difficulty: Easy LO: 2.1

3. If you are in a business that is faced with enormous risks of failure what type of ownership would you avoid?

- A. Corporation
- B. Sole partnership
- C. General partnership
- D. Sole proprietorship

Answer: D Type: Concept Level of Difficulty: Easy LO: 2.1

4. Which of the following is an advantage of a corporation over a sole proprietorship?

- A. A corporation is easy to set up
- B. Corporate tax laws are often less attractive than personal tax laws
- C. Shareholders' liability is limited to their investment in the corporation
- D. In a sole proprietorship, it is easier to transfer ownership

Answer: C Type: Concept Level of Difficulty: Easy LO: 2.1

5. What was the reason for the increase in the number of income trusts in Canada?

- A. Limited liability
- B. Unlimited liability
- C. Tax advantage
- D. Transfer of ownership

Answer: C Type: Concept Level of Difficulty: Easy LO: 2.1

6. Which of the following is the **most** correct? _____ know their exposure is limited to the amount of capital they invest in the company.

- A. Shareholders
- B. Sole proprietors
- C. General and limited partners
- D. Limited partners and shareholders

Answer: D Type: Concept Level of Difficulty: Medium LO: 2.1

7. Which of the following is (are) true about a general partnership?

I Some of the partners have limited liability.

II Some of the partners may not be involved in the day-to-day operations.

III Some partners may receive a different percentage of the profits.

A. III only

B. I and III

C. II and III

D. I and II

Answer: C Type: Concept Level of Difficulty: Medium LO: 2.1

8. Beginning in 2011, in Canada, what will be the most appropriate type of organization for a business with large assets and revenue?

A. Trust

B. Corporation

C. General partnership

D. Sole proprietorship

Answer: B Type: Concept Level of Difficulty: Medium LO: 2.1

9. Which of the following businesses is **most likely** to be operated as a corporation?

A. A law firm

B. A mining company

C. An accounting firm

D. All of these are likely to be operated as a corporation.

Answer: B Type: Concept Level of Difficulty: Easy LO: 2.1

10. The main purpose of creating a trust is to:

I Separate ownership from control

II Avoid legal liability

III Avoid taxes

IV Improve a firm's reputation

A. I, II, and III

B. I and IV

C. I and III

D. III and IV

Answer: C Type: Concept Level of Difficulty: Easy LO: 2.1

11. Which of the following is **not** an example of a trust?

A. A mutual fund

B. An estate

C. A royalty trust

D. A bank

Answer: D Type: Concept Level of Difficulty: Easy LO: 2.1

12. After 20 years of being the sole proprietor of Monterege Lawn Care, Denis Seville is considering making a change. His business has grown substantially over the years and he now has approximately one hundred extremely loyal clients. Denis wants to retire and move to

Florida. Unfortunately, Denis has no children to carry on his business and thus he is thinking of selling it to someone else. What is the main consideration Denis should have about selling his lawn care business?

- A. Lawn care is seasonal and not many people would want to purchase his business.
- B. No one can meet the needs of his clients as well as he can.
- C. He will face some difficulty in selling because all the client relationships are personal and belong to him; he will have to explain the new situation to each client.
- D. The new owner may not retain the same business name.

Answer: C Type: Concept Level of Difficulty: Medium LO: 2.1

13. Lucy Vale and Bob Fama, both accountants, have opened an accounting firm in Calgary together and business has been steadily increasing. Since they each have the same number of clients, Lucy and Bob decided to simply split any income equally between them. However, Lucy has recently made a grievous error in the financial statements of one of her clients, and that client is now considering suing Lucy and the firm. If Lucy and Bob had never created a formal partnership agreement since the inception of their firm, should Bob be at all concerned about the potential lawsuit? Choose the best answer from the following:

- A. No. Since there was no formal partnership agreement made, Bob cannot be held responsible for Lucy's error.
- B. Yes. A legal agreement is not always required for someone to be considered a partner of a partnership. Thus, Bob may be held partially responsible for Lucy's error in the event the client sues the firm.
- C. No. It was Lucy's client and she made the error. Bob was not involved.
- D. Yes. Bob has just incurred substantial debt by purchasing a new home which was partially financed by his share of the firm's earnings.

Answer: B Type: Concept Level of Difficulty: Medium LO: 2.1

Section 2.2 – The Goals of the Corporation

14. Which of the following should be the primary goal of a CEO in a publicly-traded company?

- A. Maximize the profit margin
- B. Avoid bankruptcy
- C. Increase market share
- D. Maximize the company's share price

Answer: D Type: Concept Level of Difficulty: Easy LO: 2.2

15. Why is wealth different from profits?

- A. Wealth is a personal issue, while profits are related to a business.
- B. Profits include a deduction for expenses, and expenses are not relevant for wealth calculations.
- C. Wealth reflects the value of all profits, both short- and long-term, while profits refer to economic profits only.
- D. All of the above.

Answer: C Type: Concept Level of Difficulty: Medium LO: 2.2

16. What are externalities?

- A. Valuable resources to a company that the firm does not pay or charge for.

- B. Issues in the surrounding business environment of a firm which have no impact on the firm's operations or policies.
- C. Members of the board of directors who are not employed by the firm.
- D. None of the above.

Answer: A Type: Definition Level of Difficulty: Easy LO: 2.2

17. Why are externalities a necessary consideration when conducting business, especially for large corporations?

- A. Externalities always cost money, and those costs hurt a firm's bottom line.
- B. Forgetting to account for externalities is against tax laws in Canada.
- C. The actions a large firm makes can have a significant impact on other firms, and those actions may not necessarily be in Canada's best interests.
- D. All of the above.

Answer: C Type: Concept Level of Difficulty: Medium LO: 2.2

18. Which of the following is/are considered a stakeholder in a mining company?

- A. Bondholders
- B. Customers
- C. Provincial government
- D. All of the above

Answer: D Type: Concept Level of Difficulty: Easy LO: 2.2

19. Which one of the following is **not** part of externalities?

- A. Union pension costs and regulations
- B. High borrowing rate
- C. Labour regulations
- D. Cost of carbon emissions

Answer: B Type: Concept Level of Difficulty: Medium LO: 2.2

20. Who, of the following, does not have a contractual claim on a company?

- A. Employees
- B. Shareholders
- C. Local community
- D. Customers

Answer: C Type: Concept Level of Difficulty: Medium LO: 2.2

21. What is the risk-return tradeoff?

- A. A firm will only have returns when it takes on risk.
- B. A firm can either have risk, or it can have returns, but not both.
- C. The balancing of gain with risk.
- D. A risky return is always preferred to a risk-free return.

Answer: C Type: Definition Level of Difficulty: Easy LO: 2.2

22. Which one of the following is **not** true about the board of directors?

- A. It represents shareholders interests
- B. It cannot ignore its stakeholders
- C. It is involved with guiding the management of the company

D. Board of directors include members of the company's management team.

Answer: B Type: Concept Level of Difficulty: Medium LO: 2.2

23. What is the main implication of the 1994 Dey Report?

A. Firms should pay attention to special interests or other stakeholders, not just shareholders.

B. Boards of directors are responsible only for ensuring management is maximizing revenue.

C. Boards of directors can ignore stakeholders and focus solely on shareholders while maintaining their contractual responsibilities.

D. Considerations for social welfare should be of utmost importance to firms.

Answer: C Type: Concept Level of Difficulty: Medium LO: 2.2

Section 2.3 – The Role of Management and Agency Issues

24. Which of the following is an example of an agency cost?

A. A company buys the latest computer equipment for its employees.

B. Senior management receives stock options enabling them to buy company stock at an exercise price well above the current stock price.

C. Managers can use the company float plane to fly to their cottages on weekends.

D. Sales reps are provided with company cars to use when visiting clients.

Answer: C Type: Concept Level of Difficulty: Easy LO: 2.3

25. Agency problems are best defined as:

A. difficulties arising in dealings with real estate agencies.

B. problems arising due to potential misalignment between the interests of owners, creditors, and managers.

C. problems arising due to the complete alignment of the interests of owners, creditors, and managers.

D. issues surrounding whether or not to outsource production to an external agency.

Answer: B Type: Definition Level of Difficulty: Easy LO: 2.4

26. Which one of the following is **not** an example of agency problem?

A. Management refusing a merger because of the possibility of major changes in management

B. Taking a high risk to increase the value of the stock options held by management.

C. Increasing the level of debt of the company to increase the return on equity value.

D. Distributing a low level of dividends to have enough cash for bonuses.

Answer: C Type: Concept Level of Difficulty: Difficult LO: 2.4

27. Which of the following will help shareholders mitigate agency problems? Shareholders can:

I Elect directors

II Challenge management through proxy fights

III Tender their shares to outsiders in a hostile takeover

IV Sell their shares on the stock market

A. I, II, and IV

B. II, III, and IV

C. I, II, and III

D. I, II, III, and IV

Answer: D Type: Concept Level of Difficulty: Medium LO: 2.3

28. Which of the following is true?

- A. Managers can ignore the objective of shareholder wealth in the short-run in favour of other stakeholders' interests, but not in the long run.
- B. In 2000, BCE spun-off its ownership in Nortel, making this an example of a firm's agency costs diminishing shareholder value.
- C. A 1997 Canadian survey of Shareholder Value Measurement showed that a minority of companies with listed shares state maximizing firm value is a key corporate objective.
- D. Without adequate financial performance, a firm can survive in a competitive environment.

Answer: A Type: Concept Level of Difficulty: Medium LO: 2.4

29. You are asked to watch over your brother and sister in exchange for a fee. You invited your friends over and you watched TV all night without paying attention to your siblings. What type agency problem is this?

- A. Indirect
- B. Direct
- C. Moral hazard
- D. None of the above

Answer: C Type: Concept Level of Difficulty: Medium LO: 2.4

30. Which of the following is true?

- A. Management buying another business at a premium may be an example of an agency cost.
- B. Sole proprietorships can be vulnerable to agency costs.
- C. Stock options are an example of an agency cost.
- D. Agency costs do not include expenses of monitoring and controlling the actions of management.

Answer: B Type: Concept Level of Difficulty: Hard LO: 2.4

31. A merger between Bank of Montreal and TD bank would be a potential

- A. Agency problem
- B. Too big to fail problem
- C. Moral hazard
- D. None of the above

Answer: B Type: Concept Level of Difficulty: Easy LO: 2.4

32. Of the following list, which represents a potential implication for agency issues when shareholders are dispersed?

- A. More shareholders have a controlling say in what happens in the firm.
- B. The likelihood of management pleasing all shareholders is greatly improved.
- C. A firm's chief executive officer (CEO) is better able to choose his or her friends to sit on the board of directors.
- D. None of the above.

Answer: C Type: Concept Level of Difficulty: Medium LO: 2.4

33. Which one of the followings is not a criterion that managers prefer to be judged upon?

- A. Return on Assets
- B. Return on Equity
- C. Share price

D. Market share

Answer: C Type: Concept Level of Difficulty: Easy LO: 2.3

34. Why do shareholders have a greater preference for risk than do managers?

- A. Shareholders are always richer than managers, and can afford to take more risk.
- B. Shareholders can diversify risk by holding many securities, while a manager's career is tied up with the firm.
- C. Because they are investing in the stock market, shareholders must naturally prefer taking more risk than managers.
- D. Managers do not like risk because it hurts the value of the company.

Answer: B Type: Concept Level of Difficulty: Medium LO: 2.3

35. What is the main purpose behind share incentive plans?

- A. The plans encourage managers to invest in the stock market.
- B. The plans are meant to align the interests of management and shareholders.
- C. The plans encourage managers to give shares as incentives for employees.
- D. All of the above.

Answer: B Type: Concept Level of Difficulty: Easy LO: 2.3

36. Which one of the following is true?

- A. Managers have the mandate to increase the market value of the company.
- B. Managers do not always look after shareholders' interests.
- C. The Board of directors is legally responsible for all the company's decisions.
- D. All of the above

Answer: A Type: Concept Level of Difficulty: Medium LO: 2.3

37. Share incentive plans have not produced the desired results. Why?

- A. The retooling of option grants and share incentive schemes
- B. Compensation schemes are generally designed to reward management, not to provide incentives
- C. Fraud
- D. All of the above

Answer: D Type: Concept Level of Difficulty: Medium LO: 2.3

38. Which one of the following is **not** a way to improve the efficiency in Canadian wealth management?

- A. Encourage takeovers
- B. Limit management's defence mechanisms with regards to takeovers
- C. Hold managers personally accountable
- D. Increase measures of corporate governance

Answer: B Type: Concept Level of Difficulty: Medium LO: 2.3

39. Which of the following is **not** a reason why the market for corporate control is the most effective mechanism to give managers the incentive to act like shareholders?

- A. The government imposes significant lawsuits and penalties for managers not acting in the best interests of shareholders.

B. The threat of acquisition keeps managers focused on achieving good performance and a high stock price.

C. A low stock price makes a firm a good target for acquisition.

D. It allows the best managers the chance to manage assets.

Answer: A Type: Concept Level of Difficulty: Medium LO: 2.3

Section 2.4 – Corporate Finance

40. Which of the following is an example of a capital structure decision?

A. Issuing new shares

B. Buying a new factory

C. Reducing inventory levels

D. Increasing purchases on credit

Answer: A Type: Definition Level of Difficulty: Easy LO: 2.5

41. The framework for analyzing investment or asset decisions is known as:

A. income management analysis

B. capital budgeting analysis

C. capital aligning analysis

D. asset allocation analysis

Answer: B Type: Definition Level of Difficulty: Easy LO: 2.5

42. Capital budgeting refers to:

A. The decision to raise capital from the market

B. The decision to allocate assets of the firm for investment

C. The decision to budget the administrative expenses of the firm

D. The decision to budget compensation within the firm

Answer: B Type: Definition Level of Difficulty: Medium LO: 2.5

43. What does it mean to “go public”?

A. To sell goods and services to the public

B. To raise money from the stock market

C. To borrow money from the debt market

D. To do business with governmental firms

Answer: B Type: Definition Level of Difficulty: Medium LO: 2.5

44. If a controller is responsible for liquidity management, which of the following accounts is she **not** interested in?

A. Long-term debt

B. Cash

C. Accounts payable

D. Inventory

Answer: A Type: Concept Level of Difficulty: Medium LO: 2.5

45. Another term for the “paper” market is:

A. debt market

B. equity market

C. money market

D. options market

Answer: C Type: Definition Level of Difficulty: Easy LO: 2.5

46. Which of the following statements is **not** true?

- A. Cash and cash equivalents are defined as: deposits in banks plus short-term investments.
- B. A firm's accounts receivable is debt owed to them by other firms.
- C. Another term for accounts receivable is trade credit.
- D. A firm's mortgages would appear on the asset side of its balance sheet.

Answer: D Type: Definition Level of Difficulty: Easy LO: 2.5

47. Which one of the following is not part of financial management?

- A. Deciding on sources of capital financing
- B. Deciding on debt and equity
- C. Deciding on buying property
- D. Deciding on changing company image

Answer: D Type: Concept Level of Difficulty: Easy LO: 2.5

48. Which of the following is **not** a source of corporate financing?

- A. Equity
- B. Retained earnings
- C. Bonds
- D. Fixed capital

Answer: D Type: Definition Level of Difficulty: Medium LO: 2.5

Section 2.5 – Finance Careers and the Organization of the Finance Function

49. Typical duties of the financial manager include:

- I Raising funds
- II Product line evaluation
- III Controlling the disbursement of funds
- IV Dividend policy
- V Auditing financial statements
- VI Shareholder relations
- VII Setting personnel policy
- VIII Pricing of the company's products

A. I, III, IV, V, and VI

B. I, III, IV, and VI

C. III, IV, VI, and VII

D. II, III, VI, and VIII

Answer: B Type: Concept Level of Difficulty: Hard LO: 2.6

50. Which of the following is the least important of the financial manager's responsibilities?

- A. Keep an up-to-date record on past operations
- B. Contain costs and foster productivity improvements
- C. Raise funds to support the ongoing operations and planned investments
- D. Control the dispersal of funds to ensure efficiency and adequate returns

Answer: A Type: Concept Level of Difficulty: Medium LO: 2.6

51. All of the following are the responsibility of the controller except:

- A. financial planning
- B. liquidity management
- C. mergers and acquisitions
- D. dividend policy

Answer: D Type: Definition Level of Difficulty: Medium LO: 2.6

52. The primary objective of the financial manager is to:

- A. maximize earnings
- B. maximize dividend payments
- C. maximize shareholder wealth
- D. maximize revenue

Answer: C Type: Concept Level of Difficulty: Easy LO: 2.6

53. If you are working for a company and your job description includes accounting, budgeting, internal audit, systems management/MIS, and tax management, you are most likely a(n):

- A. treasurer
- B. tax accountant
- C. auditor
- D. controller

Answer: D Type: Concept Level of Difficulty: Easy LO: 2.6

54. In major financial institutions, people generally start out their careers as:

- A. Consultants
- B. Analysts
- C. Account managers
- D. Banking associates

Answer: B Type: Definition Level of Difficulty: Medium LO: 2.6

Practice Problems

55. Define the term finance. What are the three broad functional categories associated with finance?

Type: Definition Level of Difficulty: Easy LO: 2.5

Suggested answer:

Finance is the study of the management of funds. The three broad functional categories associated with finance are:

1. Making long-term investment decisions, also called capital budgeting decisions
2. Making long-term financing decisions, also called capital structure decisions
3. Managing day-to-day activities, also called working capital (or liquidity) management

56. Give three potential advantages that explain why corporations represent a small percentage of the total number of businesses in Canada, but dominate in terms of assets and dollar volumes of sales.

Type: Concept Level of Difficulty: Medium LO: 2.1

Suggested answer:

- i) Limited liability: investors know that their exposure to loss is limited

- ii) Transfer of ownership is relatively easy; investors can cash out at any time if they need cash or are unhappy with the direction in which the company is headed
- iii) Corporate tax laws may be more attractive in some circumstances, allowing tax deferral or avoidance

In principle, the separation of ownership from control allows corporations to obtain the best available management team.

57. Give two reasons for the importance and scope of finance.

Type: Concept Level of Difficulty: Medium LO: 2.5

Suggested answer:

First, the scale of operations of business firms has expanded greatly in recent years. The growing significance of large corporations and the increasing size of investments highlight the importance of long-range financial planning.

Second, the widespread diversification of products and the global nature of today's business environment have increased the complexity of managing a business. We now have multiproduct, multidivisional and multinational corporations.

58. Which is a better economic objective for financial managers: maximizing profit or maximizing share price? Why? Give three reasons.

Type: Concept Level of Difficulty: Medium LO: 2.2

Suggested answer:

Maximizing share price is a better economic objective for financial managers because simple profit maximization does not address the following three issues:

Profits versus Return on Capital – Profits have to be viewed in relation to the amount of capital invested. The wealth position of shareholders can suffer even when total profits increase.

Timing of cash flows – The time value of money has to be considered when comparing profits across different time periods. Identical dollar amounts received at two different points in time do not have the same economic value.

Risk – Any stream of anticipated profits is subject to risk. Given the same potential return, investors will prefer less risk, as they are risk adverse. Investors will demand a higher return, or a risk premium, in order to invest in risky securities.

The objective of share price maximization overcomes the shortcomings of profit maximization.

59. Explain the concept of “too big to fail” and how it relates the latest financial crisis.

Type: Concept Level of Difficulty: Medium LO: 2.4

Suggested answer:

The “too big to fail” argument relates to firms that employ a high number of people or are involved in a vital sector of the economy. The argument refers to the inability of society to lose firms that are important, and so society must do whatever is in its power to protect these large businesses. However, the issue becomes: how can we control the management of businesses that are important in the economy? The saving of AIG and other financial institutions during the last crisis shows the cost that the society pays as a result.

60. Describe what is meant by agency relationships, and outline the potential conflicts of interest that may arise.

Type: Definition Level of Difficulty: Medium LO: 2.4

Suggested answer:

One type of agency relationship arises when there is a separation of management from ownership, which results in management being hired to act as an agent on behalf of the owner. Potential conflicts of interest arise when actions that are in the best interest of shareholders do not coincide with those that are in management's best interests.

Another type of agency relationship arises when a corporation finances its activities with both equity and debt. At times, shareholders (who control the decisions of the firm) have an incentive to invest in projects that are detrimental to bondholders. To eliminate the potential for such actions, bondholders put restrictive covenants in the debt contracts restricting the actions of management. These covenants may impair management's ability to make value-maximizing decisions.

61. Do agency costs only occur in a corporation, or can you have agency costs in a sole proprietorship?

Type: Concept Level of Difficulty: Hard LO: 2.4

Suggested answer:

Agency costs primarily occur in corporations, but can also occur in other forms of business. Whenever an owner of a business hires another person to act on their behalf, there exists an agency relationship. Whenever there exists an agency relationship, there is a potential for conflicts of interest to arise, and therefore agency costs may be incurred.

62. Edna's Edibles Inc. has after-tax profits of \$10,000 per year and 5,000 shares outstanding. The management of Edna's Edibles is considering starting a new product line. This new line requires management to raise more money by issuing 3,000 shares of new equity. If this new line increases total profits by \$5,000, should Edna's management proceed with the new line?

Type: Calculation Level of Difficulty: Medium LO: 2.5

Suggested answer:

Before introducing the new product line, earnings per share was $\$10,000 \div 5,000$ or \$2.00 per share.

The new product line will increase earnings to \$15,000 ($\$10,000 + \$5,000$) and increase shares outstanding to 8,000 ($5,000 + 3,000$). The new earnings per share will be $\$15,000 \div 8,000$ or \$1.875 per share.

Thus, this new line will decrease shareholders' wealth by diluting earnings. Therefore, management should not proceed with the new investment.

63. Frank Wood, the owner of Cozy Corner Cabinets (CCC) has just hired Joe Boss to manage his company. Instead of using a flat salary, the two men have agreed that Joe will be paid 15 percent of the profits at the end of each year. CCC currently has three project opportunities to choose from, and can only choose one of them. Project A will generate profits of \$75,000 per year, and will increase the value of CCC by \$145,000. Project B will generate profits of \$63,000 per year, and will increase the value of CCC by \$153,000. Project C will generate profits of \$68,000 per year, and will increase the value of CCC by \$138,000. Which project is Joe Boss likely to choose and why? As the owner of CCC, which project would Frank prefer?

Type: Calculation Level of Difficulty: Hard LO: 2.5

Suggested answer:

Under Project A, Joe would receive $0.15 * \$75,000 = \$11,250$ per year. Under Project B, Joe would receive $0.15 * \$63,000 = \$9,450$. Under Project C, Joe would receive $0.15 * \$68,000 = \$10,200$. Thus, since $\$11,250 > \$10,200 > \$9,450$, Joe would choose Project A to maximize his income.

However, Frank would prefer that Project B be chosen as it results in the greatest increase in firm value for CCC ($\$153,000 > \$145,000 > \$138,000$).

Unauthorized

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Chapter 3: Financial Statements

Multiple Choice Questions

Section 3.1 – Accounting Principles

1. The CICA handbook contains the accounting principles of:

- A. The United States
- B. Canada
- C. The European Community
- D. Ontario

Answer: B Type: Definition Level of Difficulty: Easy LO: 3.1

2. The IASB located in London is responsible for harmonizing accounting principles in:

- A. US only
- B. European Union
- C. Developed countries
- D. World countries

Answer: D Type: Definition Level of Difficulty: Easy LO: 3.1

3. The stock of the Tremblay Maple Syrup Company is listed on both the Toronto and New York stock exchanges. Tremblay must prepare financial statements in accordance with:

- I. Canadian GAAP only
- II. US GAAP and Canadian GAAP
- III. IASB GAAP only

- A. I only
- B. II only
- C. I and III only
- D. II and III

Answer: B Type: Concept Level of Difficulty: Easy LO: 3.1

4. Which one of the following implicate(s) a misrepresentation of financial statements?

- A. The statements deceive investors.
- B. The statements overstate earnings and inflate the value of assets.
- C. The statements mislead analysts in estimating the market value of the firm
- D. All of the above.

Answer: D Type: Concept Level of Difficulty: Medium LO: 3.1

5. Which one of the following is **not** true?

- A. Accounting standards evolve to improve the representation of financial statements.
- B. Accounting scandals introduced worse accounting standards.
- C. There is more and more collaboration between different countries to harmonize accounting standards.
- D. IASB is working with different accounting boards to harmonize worldwide standards.

Answer: B Type: Concept Level of Difficulty: Medium LO 3.1

6. The Sarbanes-Oxley Act (SOX) requirements include:

- I An audit committee made up of independent directors

- II A separation of audit and consulting functions
- III A certification of financial statements by the CEO and CFO
- A. I and II only
- B. I and III only
- C. III only
- D. I, II and III

Answer: D Type: Definition Level of Difficulty: Easy LO: 3.1

Section 3.2 – Organizing a Firm's Transactions

7. “Debiting” an account,
 I increases an asset account.
 II increases a liability account.
 III increases an equity account.

- A. I only
- B. II only
- C. I or II only
- D. II or III only

Answer: A Type: Definition Level of Difficulty: Easy LO: 3.2

8. “Crediting” an account,
 I increases an asset account and decreases a liability account.
 II increases a liability account and decreases an asset account.
 III could increase both an equity account and a liability account.

- A. I only
- B. II only
- C. I and II only
- D. II and III only

Answer: D Type: Definition Level of Difficulty: Easy LO: 3.2

9. You bought a sanding machine from the local hardware store using the credit card of the store chain on December 30th, 2009 to be delivered in January 10th, 2010. When is the sale recognized?

- A. When the payment is made to the card
- B. When you receive the machine on Jan 10th 2010
- C. When you made the purchase on Dec 30th, 2009
- D. When the credit card company makes the payment o the store

Answer: C Type: Concept Level of Difficulty: Hard LO: 3.2

10. The basic principles of GAAP do not include:

- A. The entity concept
- B. Liquidation valuation
- C. The matching principle
- D. Revenue recognition

Answer: B Type: Definition Level of Difficulty: Medium LO: 3.2

11. You own a small business and you decide to purchase insurance for your business on April 30th which covers a twelve month period beginning the next day. The insurance company requires the annual premium amount upfront. On December 31st, what portion of the premium you should expense in your financial statements?

- A. 100%
- B. 75%
- C. 67%
- D. 33%

Answer: A Type: Concept Level of Difficulty: Hard LO: 3.2

12. On January 15, 2008, the Dam-M-Up Company entered into an agreement with Quebec Hydro to build a dam in Northern Manitoba. Construction will begin on January 1, 2009 and will be completed by December 15, 2010. According to the matching principle, when should the revenue from this project be recognized?

- A. January 15, 2008 (when the contract is signed)
- B. As the work is carried out (2009 and 2010)
- C. When the work is completed
- D. When payment is received

Answer: B Type: Concept Level of Difficulty: Medium LO: 3.2

Section 3.3 – Preparing Accounting Statements

13. Which of the following statements is **not** correct?

- A. The cash flow statement is a summary of the firm's cash receipts and disbursements over a specified period.
- B. Traditional cash flow equals net income plus cash expenses.
- C. Cash flow from operations equals traditional cash flow less the increase in net working capital.
- D. Free cash flow equals cash flow from operations less capital expenditures.

Answer: B Type: Definition Level of Difficulty: Easy LO: 3.3

14. Which of the following is **not** a source of cash?

- A. Increase in owners' equity
- B. Increase in accounts payable
- C. Decrease in accounts receivable
- D. Increase in inventory

Answer: D Type: Concept Level of Difficulty: Medium LO: 3.3

15. Assume the following information from the financial statements of ReStateM Company:

Net income:	\$10,000
Depreciation:	\$3,000
Salaries:	\$5,000
Deferred income taxes:	\$2,000
Change in accounts receivable:	\$4,000
Change in accounts payable:	-\$5,000
Change in inventory:	-\$2,000
Capital expenditures:	\$1,500

The traditional cash flow for ReStateM Company is:

- A. \$13,000
- B. \$8,000
- C. \$15,000
- D. \$10,000

Answer: C Type: Calculation Level of Difficulty: Medium LO: 3.3

Explanation:

$$NI + D + DIT = 10 + 3 + 2 = \$15,000$$

16. Assume the following information from the financial statements of ReStateM Company:

Net income:	\$10,000
Depreciation:	\$3,000
Salaries:	\$5,000
Deferred income taxes:	\$2,000
Change in accounts receivable:	\$4,000
Change in accounts payable:	-\$5,000
Change in inventory:	-\$2,000
Capital expenditures:	\$4,000

The change in net working capital for ReStateM Company is:

- A. Increase \$7,000
- B. Decrease \$7,000
- C. Increase \$2,000
- D. Decrease \$2,000

Answer: A Type: Calculation Level of Difficulty: Medium LO: 3.3

Explanation:

$$\text{Change in AR} + \text{change in I} - \text{change in AP} = 4 - 2 - (-5) = \text{increase } 7$$

17. Assume the following information from the financial statements of ReStateM Company:

Net income:	\$10,000
Depreciation:	\$3,000
Salaries:	\$5,000
Change in net working capital:	\$9,000
Capital expenditures:	\$4,000

The cash flow from operations for ReStateM is:

- A. \$22,000
- B. -\$22,000
- C. \$4,000
- D. -\$4,000

Answer: C Type: Calculation Level of Difficulty: Medium LO: 3.3

Explanation:

$$NI + D - \Delta NWC = 10 + 3 - 9 = 4$$

18. Assume the following information from the financial statements of ReStateM Company:

Net income:	\$10,000
Depreciation:	\$3,000
Salaries:	\$5,000
Change in net working capital:	\$9,000
Capital expenditures:	\$2,000

The free cash flow for ReStateM is:

- A. \$24,000
- B. \$20,000
- C. \$6,000
- D. \$2,000

Answer: D Type: Calculation Level of Difficulty: Medium LO: 3.3

Explanation:

$$NI + D - \Delta NWC - CAP_{ex} = 10 + 3 - 9 - 2 = 2$$

Section 3.4 – Tim Hortons Accounting Statements

19. The consolidated financial statements of XYZ indicate minority interests valued at \$10,000. The total owner's equity is \$50,000. The minority interest value reflects:

- A. The fraction of XYZ's equity that is owned by visible minorities
- B. The fraction of XYZ's equity that is held by small shareholders
- C. The fraction of XYZ's equity that is not owned by XYZ's shareholders
- D. The fractions of XYZ's equity that has been authorized but not yet issued

Answer: C Type: Concept Level of Difficulty: Hard LO: 3.4

20. Why is there a difference between earnings and cash flows?

- A. Because of accruals and non-cash items.
- B. Because of the difference in accounting methods.
- C. Because Cash flow statements and income statements follow different GAAP.
- D. Because expenses are not accounted for the same way as revenues.

Answer: A Type: Definition Level of Difficulty: Easy LO: 3.4

Section 3.5 – The Canadian Tax System

21. Frank lives and works in Alberta and earned \$50,000 in income. Percival lives and works in Nova Scotia and also earned \$50,000 income. If the only difference between the two people is where they live, then

- A. Frank and Percival will have the same total income tax bill.
- B. Frank and Percival will have the same Federal income tax bill.
- C. Frank and Percival will have the same Provincial income tax bill.
- D. Where they live has no impact on their income tax bill.

Answer: B Type: Concept Level of Difficulty: Easy LO: 3.5

22. Which of the following statements is true about personal taxes in Canada?

- A. Individual and corporate marginal tax rates are the same.
- B. Capital gains and interest income are taxed at the same rate for individuals.
- C. Dividends received from Canadian corporations are taxed differently than dividends received from US corporations.

D. Capital losses occur when a depreciable asset is sold below its original purchase price.

Answer: C Type: Concept Level of Difficulty: Easy LO: 3.5

23. Which of the following statements is true?

A. The CCA rate is the same for most asset classes, with the exception of land.

B. When an asset is sold, the salvage value is added to the aggregate value of the asset class.

C. If no assets are bought or sold, the CCA amount will be constant over time.

D. In the year of the acquisition, the CCA claim is based on half the cost of the asset.

Answer: D Type: Concept Level of Difficulty: Medium LO: 3.5

24. What does the UCC represents?

A. The amount of depreciation that should be expensed in the income statement.

B. The residual amount that should be depreciated over consecutive years.

C. The salvage value of the asset.

D. The capital expenditure value that is reported on the cash flow statement.

Answer: B Type: Definition Level of Difficulty: Easy LO: 3.5

25. The Confu Corp's income statement for the year ended 2009 shows depreciation expense of \$25,000. The total amount of CCA claimed in 2009 _____ \$25,000

A. must equal

B. cannot equal

C. need not equal

D. must be less than

Answer: C Type: Concept Level of Difficulty: Easy LO: 3.5

26. On June 1st, 2009, XYZ bought office equipment for \$50,000. The equipment falls into class 8 with a CCA rate of 20%. Assuming that the equipment is the only asset in that class, what is the CCA that XYZ can claim for the fiscal year ended December 31, 2009?

A. 4,167

B. 5,833

C. 5,000

D. 10,000

Answer: B Type: Calculation Level of Difficulty: Medium LO: 3.5

Explanation:

$$0.2 * 50000 * 7/12 = 5,833$$

27. On March 15, 2009, XYZ bought a machine for \$50,000. The machine is in class 43 with a CCA rate of 30%. Assuming that the machine is the only asset in that class, what is the CCA that XYZ can claim for the fiscal year ended December 31, 2009?

A. \$7,500

B. \$11,250

C. \$12,750

D. \$15,000

Answer: A Type: Calculation Level of Difficulty: Easy LO: 3.5

Explanation:

$$3 * .5 * 50000 = \$7,500$$

28. On March 15, 2009, XYZ bought a machine for \$50,000. The machine is in class 43 with a CCA rate of 30%. Assuming that the machine is the only asset in the class, what is the CCA that XYZ can claim for the fiscal year ended December 31, 2010?

- A. \$7,500
- B. \$11,250
- C. \$12,750
- D. \$15,000

Answer: C Type: Calculation Level of Difficulty: Easy LO: 3.5

Explanation:

$$3(50000 - 7500) = \$12,750$$

29. On March 15, 2009, XYZ bought a machine for \$50,000. The machine is in class 43 with a CCA rate of 30%. Assuming that the machine is the only asset in the class, what is the UCC (undepreciated capital cost) for the machine class on January 1, 2011?

- A. \$20,000
- B. \$27,500
- C. \$29,750
- D. \$50,000

Answer: C Type: Calculation Level of Difficulty: Medium LO: 3.5

Explanation:

$$(.3 \times .5 \times 50,000) = 7,500 \text{ (yr 1 CCA)}. \text{ Year 2 CCA} = (50,000 - 7,500) \times .3 = 12,750. \text{ UCC} = 50,000 - 7,500 - 12,750 = \$29,750$$

30. On January 1, 2009, the LMOT Company had the following UCC balances:

Class 43, CCA rate = 30%, UCC = \$25,000

Class 8, CCA rate = 20%, UCC = \$10,000

During 2009, LMOT neither bought nor sold any assets. The total CCA that LMOT can claim in 2009 is:

- A. \$4,750
- B. \$7,000
- C. \$9,500
- D. \$10,500

Answer: C Type: Calculation Level of Difficulty: Easy LO: 3.5

Explanation:

$$(.3 \times 25) + (.2 \times 10) = 9.5$$

31. The sale of depreciable assets cannot result in _____.

- A. capital gains
- B. capital losses
- C. CCA recaptures
- D. terminal losses

Answer: B Type: Concept Level of Difficulty: Medium LO: 3.5

Capital loss only for non-depreciable assets.

32. A CCA recapture or terminal loss can arise when
I the CCA asset class is terminated
II assets are sold for less than UCC of asset class
III assets are sold for more than UCC of asset class

- A. I only
- B. II only
- C. II or III only
- D. I or III only

Answer: D Type: Concept Level of Difficulty: Medium LO: 3.5

33. Five years ago, the Ottawa Styling institute bought a hair straightening machine for \$200,000. Assume the machine is the only asset in its class. The company has just sold the machine for \$235,000. The UCC of the asset class just before the sale is \$85,000. The tax consequences of this sale are:

- I Capital gain
- II CCA recapture
- III CCA terminal loss

- A. I only
- B. I and II only
- C. I and III only
- D. II only

Answer: B Type: Calculation Level of Difficulty: Medium LO: 3.5

34. Five years ago the Ottawa Styling institute bought a hair straightening machine for \$200,000. Assume the machine is the only asset in its class. The company has just sold the machine for \$235,000. The UCC of the asset class just before the sale is \$85,000. In terms of total amounts, the taxable consequences of this sale totals:

- A. \$17,500
- B. \$35,000
- C. \$115,000
- D. \$132,500

Answer: D Type: Calculation Level of Difficulty: Medium LO: 3.5

Explanation:

Taxable Capital gain + recapture = $\$35 \times .5 + (200 - 85) = \$132,500$

35. Five years ago, the J.Hi bought a paper cup making machine for \$50,000. Assume the machine is the only asset in its class. The company has just sold the machine for \$35,000. The UCC of the asset class just before the sale is \$15,000. What are the tax consequences of this sale?

- A. There is zero tax consequence since the machine was sold for less than its acquisition cost.
- B. A capital loss of \$15,000.
- C. A CCA recapture of \$20,000.
- D. A terminal loss of \$20,000.

Answer: C Type: Calculation Level of Difficulty: Medium LO: 3.5

Practice Problems:

36. Fred is confused. He has just deposited \$100 in his savings account and the cashier said: “Your account will be credited with \$100”. Fred knows that depositing the cash in his account has increased his assets and therefore his savings account should be debited, so why is the bank crediting his account?

Type: Concept Level of Difficulty: Difficult LO: 3.1

Suggested answer:

Fred’s savings account is his asset and the bank’s liability. Therefore, when Fred increases his asset (deposits in the savings account) he increases the bank’s liability. So Fred will view the deposit as a debit from his perspective, while the bank, from its perspective, will record a credit in its financial accounts.

37. Mira is considering two offers: one in Montreal and the other in Halifax. She did the analysis and found that it would pay her the same thing in terms of purchasing power. What else should she consider in terms of decision making?

Type: Concept Level of Difficulty: Easy LO: 3.5

Suggested answer:

The two jobs are offered in two different provinces; therefore there are differences in terms of income taxes and sales taxes in these two provinces. The higher the taxes, the lower the amount left for her consumption.

38. Charles is considering investing in PDQ Technical Instruments. He feels this is a good investment because the auditor said: “...in our opinion, these consolidated financial statements present fairly, in all material respects, the financial position of PDQ Technical Instruments”.

Comment on Charles’ reasoning.

Type: Concept Level of Difficulty: Medium LO: 3.3

Suggested answer:

The auditor’s statement only indicates that, in their opinion, the financial statements reflect the state of the company’s finances. If the company has no cash, the financial statements should reflect this state; if the company has a lot of cash, the financial statements should also reflect this state. The auditor is not making any investment recommendation or judgment about the value of the company. Charles must still evaluate the information and reach his own conclusions about the value of the company.

39. In the text the author says: “...corporate finance strategies that are based on the U.S. tax code are not directly applicable in Canada or Europe”. Why is this true? Discuss.

Type: Concept Level of Difficulty: Medium LO: 3.5

Suggested answer:

Many of management’s decisions depend upon the amount that must be paid in taxes. Decisions to purchase certain assets or to pay a certain amount to investors depend upon the tax advantages of these actions. Hence, it is vitally important that managers understand the tax implications of their decisions with respect to the country that will levy the tax.

40. Why is an increase in net working capital a decrease in free cash flow?

Type: Concept Level of Difficulty: Hard LO: 3.3

Suggested answer:

Net working capital = Current assets – Current liabilities. For example: (Accounts receivable + Inventory) – Accounts Payable.

If NWC increases, we can have (amongst other possibilities):

1. Accounts receivable increase: decreases free cash flows as customers are paying their bills later; we are receiving the cash later hence less FCF
2. Inventory increase: have to invest more cash to buy inventory hence lower FCF
3. Accounts payable decrease: have to use cash to repay bills hence less FCF

As NWC increases, we are tying up more cash in AR, AP and Inventory so consequently we have lower free cash flows.

41. Why is the tax deductibility of interest important for firm decision making?

Type: Concept Level of Difficulty: Medium LO: 3.5

Suggested answer:

The fact that the interest expense is tax deductible decreases the cost of the debt itself. Hence, it improves the value of the company as some of the value of the interest is recovered by the lower tax expense. The government is really subsidizing the use of debt financing through this tax break.

42. It is April and Michael is doing his taxes and is very confused. In his finance text book, it says that in Canada the tax system was designed to reduce the double taxation of dividends from Canadian corporations. However, he finds that on his tax return he has to “gross-up” the amount of the dividends he received and add that to his income. Explain to Michael how the Canadian personal tax system reduces the double taxation of dividends.

Type: Concept Level of Difficulty: Hard LO: 3.5

Suggested answer:

Michael is missing half the picture: the dividend tax credit. The Canadian approach is to gross-up the dividend to obtain a value as if the corporation hadn't paid taxes (remember companies pay dividends from after-tax dollars). This “grossed-up” amount will be added to Michael's taxable income. After that, the dividend tax credit (another fraction of the dividend received) will be deducted from Michael's tax bill to compensate him for the taxes paid at the corporate level. The net effect is that Michael will pay less tax on dividend income from Canadian companies than he will on interest income from those same companies.

43. Explain the rationale behind the half-year rule.

Type: Concept Level of Difficulty: Hard LO: 3.5

Suggested answer:

Investments in capital assets are undertaken throughout the year. If an asset is acquired towards the end of the year, in the absence of the half-year rule the company will receive a tax benefit for the entire year, regardless of when the asset was purchased. The government introduced the half-year rule to prevent this. As a result, the tax benefit of any acquisition is limited to half the amount in the first year, regardless of date of purchase. Assuming all purchases occur half-way through the year reduces the cost of administering the Capital Cost Allowance system.

44. The Montreal Smoked Meat Company (MSM) purchased a machine on February 1, 2008 for \$25,000. On October 10, 2008 it purchased another machine for \$50,000. Both machines have a CCA rate of 30% and are in the same asset class. These are the only machines in the class and the

company makes no asset purchases or sales for the next four years. MSM's fiscal year end is December 31st. Complete the following table (and show your work):

Fiscal year end	UCC (beginning of year)	CCA	UCC (end of year)
2008			
2009			
2010			

Type: Calculation Level of Difficulty: Medium LO: 3.5

Suggested answer:

Fiscal year end	UCC (beginning of year)	CCA	UCC (end of year)
2008	\$0	$.3 * (.5 * (50 + 25))$ = \$11,250	$(50 + 25) - 11.25 = \$63,750$
2009	\$63,750	$.3 * \text{UCC}(\text{beg}) =$ \$19,125	\$44,625
2010	\$44,625	\$13,387.50	\$31,237.50

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Chapter 4: Financial Statement Analysis and Forecasting

Multiple Choice Questions

Section 4.1 – Consistent Financial Analysis

1. Ratios should not be used to compare two companies in different industries since wide variation across industries can occur. But even within an industry, sometimes comparisons can be problematic. Which of the following is/are a reason(s) for concern?

- A. Methods of calculating ROE may differ between analysts
- B. Company choice between weighted average and FIFO inventory valuations
- C. Companies are based in different countries
- D. All of these are reasons for concern.

Answer: D Type: Concept Level of Difficulty: Easy LO: 4.1

2. The International Financial Reporting Standards will be adopted in Canada by 2011. How does that affect comparability of financial statements across countries?

- A. It achieves greater comparability in the short term.
- B. It achieves greater comparability in the long term.
- C. IFRS is not intended to improve comparability.
- D. IFRS coordinates only a few changes in financial reporting standards.

Answer: B Type: Concept Level of Difficulty: Easy LO: 4.1

3. Which of the following people would be likely to calculate financial ratios for a company?

- A. Bondholders
- B. Equity holders
- C. Suppliers
- D. All of these would calculate ratios on a company

Answer: D Type: Concept Level of Difficulty: Medium LO: 4.1

4. Which of the following people would be *least* likely to calculate financial ratios for a company?

- A. Bondholders
- B. Equity holders
- C. Suppliers
- D. Customers

Answer: D Type: Concept Level of Difficulty: Medium LO: 4.1

Section 4.2 – A Framework for Financial Analysis

5. Which of the following are *not* components in the DuPont analysis?

- A. Leverage ratios
- B. Efficiency ratios
- C. Liquidity ratios
- D. Productivity ratios

Answer: C Type: Definition Level of Difficulty: Easy LO: 4.2

6. What is a pure financial ratio?

- A. A financial ratio that does not include non cash items.

- B. A financial ratio for the same year.
- C. A financial ratio that involves items from the same financial statement.
- D. A financial ratio using the same GAAP.

Answer: C Type: Definition Level of Difficulty: Medium LO: 4.2

7. Which of the following is *not* true?

- A. Financial analysis can be fully standardized.
- B. Effective analysis requires identification of the most appropriate ratios for the particular objective, as all ratios will not give the same information.
- C. The output from financial analysis can often provide only general clues.
- D. Some financial ratios will not be appropriate for firms of different sizes.

Answer: A Type: Concept Level of Difficulty: Medium LO: 4.2

8. Return on Equity can be calculated by: Net Income / Average Shareholders Equity. The reasoning for this method is:

- A. net income is earned over the year and shareholder's equity measures invested capital at the end of the year. Average shareholder's equity gives a measure of capital invested throughout the year.
- B. net income is measured at the end of the year and shareholder's equity is measured at the beginning of the year. Averaging the shareholder's equity will result in a better match between the timing of the net income measure and the measure of the invested capital (equity).
- C. to reduce the number of observations.
- D. to increase ROE as average shareholders' equity is usually lower than ending shareholders equity.

Answer: A Type: Concept Level of Difficulty: Medium LO: 4.2

9. If GUW and BFG have the same return on equity then:

- I. The two companies must have the same operating performance
 - II. If GUW has higher leverage than BFG, it must also have higher operating performance
 - III. If BFG has lower operating performance than GUW, it must also have higher leverage
- A. Only I is true
 - B. Only III is true
 - C. Only II and III are true
 - D. Only I and III are true

Answer: B Type: Concept Level of Difficulty: Medium LO: 4.2

10. Which one of the following is true?

- A.** Stand alone ratios do not provide much information about the company.
- B.** Ratios are comparative measures over time or across firms.
- C.** Ratios are forward looking measures.
- D.** Analyzing historical ratios is not useful.

Answer: B Type: Concept Level of Difficulty: Medium LO: 4.2

11. The Toronto Skaters Company earned a net profit margin of 6% in 2011. Their turnover ratio is 5 and the firm had a leverage ratio of 3. The return on equity earned by Toronto Skaters in 2011 is:

- A. 0.90%
- B. 9%
- C. 10%
- D. 90%

Answer: D Type: Calculation Level of Difficulty: Easy LO: 4.2

How choices were determined:

- A. $(.0006) * 5 * 3 = 0.90\%$
- B. 9%
- C. $6\% * 5 / 3 = 10\%$
- D. $6\% * 5 * 3 = 90\%$

12. Igor the intern has obtained the following financial data for the PDQ Corporation:

	PDQ Financial Data for fiscal year end:
	2011
Net income	\$125,000
Sales	\$475,000
Total assets	\$285,000
Shareholders' equity	\$145,000

The turnover ratio for 2011 is:

- A. 1.6667
- B. 1.9655
- C. 26.32%
- D. 86.21%

Answer: A Type: Calculation Level of Difficulty: Easy LO: 4.2

How choices were determined:

- A. Turnover ratio: $\text{Sales} / \text{Total assets} = 475 / 285 = 1.6667$
- B. Leverage ratio: $\text{TA} / \text{SE} = 285 / 145 = 1.9655$
- C. Net profit margin: $\text{NI} / \text{Sales} = 125 / 475 = 26.32\%$
- D. ROE = $\text{NI} / \text{SE} = 125 / 145 = 86.21\%$

13. Igor the intern has obtained the following financial data for the PDQ Corporation:

	PDQ Financial Data for fiscal year end:
	2011
Net income	\$125,000
Sales	\$475,000
Total assets	\$285,000
Shareholders' equity	\$145,000

The leverage ratio for 2011 is:

- A. 1.6667
- B. 1.9655

C. 26.32%

D. 86.21%

Answer: B Type: Calculation Level of Difficulty: Easy LO: 4.2

How choices were determined:

A. Turnover ratio: $\text{Sales} / \text{Total assets} = 475 / 285 = 1.6667$ B. Leverage ratio: $\text{TA} / \text{SE} = 285 / 145 = 1.9655$ C. Net profit margin: $\text{NI} / \text{Sales} = 125 / 475 = 26.32\%$ D. ROE = $\text{NI} / \text{SE} = 125 / 145 = 86.21\%$

14. Igor the intern has obtained the following financial data for the PDQ Corporation:

	PDQ Financial Data for fiscal year end:
	2011
Net income	\$125,000
Sales	\$475,000
Total assets	\$285,000
Shareholders' equity	\$145,000

The return on equity for 2011 is:

A. 1.6667

B. 1.9655

C. 26.32%

D. 86.21%

Answer: D Type: Calculation Level of Difficulty: Easy LO: 4.2

How choices were determined:

A. Turnover ratio: $\text{Sales} / \text{Total assets} = 475 / 285 = 1.6667$ B. Leverage ratio: $\text{TA} / \text{SE} = 285 / 145 = 1.9655$ C. Net profit margin: $\text{NI} / \text{Sales} = 125 / 475 = 26.32\%$ D. ROE = $\text{NI} / \text{SE} = 125 / 145 = 86.21\%$ **Section 4.3 – Leverage Ratios**

15 Which of the following ratios are “flow ratios”:

A. Debt / Equity ratio

B. Times interest covered

C. Leverage ratio

D. None of the above

Answer: B Type: Concept Level of Difficulty: Easy LO: 4.3

16. Which one of the following is FALSE?

A. A high leverage ratio increases ROE.

B. A low leverage ratio decreases the risk of bankruptcy.

C. A leverage ratio is a stock ratio.

D. A low leverage ratio reduces the size of the balance sheet.

Answer: D Type: Concept Level of Difficulty: Medium LO: 4.3

17. Which of the following ratios are “stock ratios”?

- A. Debt / Equity ratio
- B. Leverage ratio
- C. Debt / Asset ratio
- D. All of the above

Answer: D Type: Concept Level of Difficulty: Easy LO: 4.3

18. Which of the following ratios would be most useful for evaluating a firm’s degree of leverage?

- A. Earnings-power ratio
- B. Debt-to-equity ratio
- C. Current ratio
- D. Asset turnover ratio

Answer: B Type: Concept Level of Difficulty: Medium LO: 4.3

19. The only debt a firm has outstanding is a \$10 million, 8 percent bond issue. If their earnings before taxes are \$5.2 million, then their times-interest-earned ratio would be:

- A. 5.5
- B. 6.5
- C. 7.5
- D. None of the above

Answer: C Type: Calculation Level of Difficulty: Medium LO: 4.3

How choices were determined:

- A. $(5.2/(10 \times .08)) - 1 = 5.5$
- B. $5.2/(10 \times .08) = 6.5$
- C. $(5.2 + .08 \times 10)/(10 \times .08) = 7.5$
- D. None of the above

20. Montreal Brewing Company has an outstanding debt of \$20 million. 10 percent of the company debt is bearing an interest expense of 8 percent and the rest costs 6 percent. If their earnings before taxes are \$5.2 million, then their times-interest-earned ratio would be:

- A. 3.2
- B. 4.2
- C. 5.2
- D. None of the above

Answer: C Type: Calculation Level of Difficulty: Medium LO: 4.3

How choices were determined:

- A. $(5.2/(2 \times .08 + 18 \times .06)) - 1 = 3.2$
- B. $5.2/(2 \times .08 + 18 \times .06) = 4.2$
- C. $(5.2 + 2 \times .08 + 18 \times .06)/(2 \times .08 + 18 \times .06) = 5.2$
- D. None of the above

21. On the balance sheet, a company reports total assets of \$8 million, common shares (book value) of \$4 million and retained earnings of \$2 million. The debt-to-asset ratio is:

- A. 0.25
- B. 0.50

C. 0.75

D. None of the above

Answer: A Type: Calculation Level of Difficulty: Medium LO: 4.3

How choices were determined:

A. Debt = $8 - (4 + 2) = 2$, $D/A = 2/8 = .25$

B. Debt = $8 - 4 = 4$, $D/A = 4/8 = .50$

C. Debt = $8 - 2 = 6$, $D/A = 6/8 = .75$

D. None of the above

22. On the balance sheet, a company reports total assets of \$8 million, common shares (book value) of \$4 million and retained earnings of \$2 million. The debt-to-equity ratio is:

A. 0.33

B. 1.00

C. 2.00

D. 3.00

Answer: A Type: Calculation Level of Difficulty: Medium LO: 4.3

How choices were determined:

A. Debt = $8 - (4 + 2) = 2$, Equity = $4 + 2 = 6$, $D/E = .33$

B. Debt = $8 - 4 = 4$, Equity = 4, $D/E = 1.00$

C. $8/4 = 2.00$

D. Debt = $8 - 2 = 6$, Equity = 2, $D/E = 6/2 = 3.00$

23. On the balance sheet of last year, a company reports total assets of \$8 million, common shares (book value) of \$4 million and retained earnings of \$2 million. At the end of the current year, the net income was \$1 million, and the whole amount was retained by the firm. Everything else (each of the aforementioned accounts other than retained earnings) was held constant. The debt-to-equity ratio at the end of the current year is:

A. 0.17

B. 0.14

C. 0.25

D. 0.33

Answer: B Type: Calculation Level of Difficulty: Difficult LO: 4.3

How choices were determined:

A. Debt = $8 - (4 + 2 + 1) = 1$ Equity = $4 + 2 = 6$; $D/E = 1/6 = 0.17$

B. Debt = $8 - (4 + 2 + 1) = 1$ Equity = $4 + 2 + 1 = 7$; $D/E = 1/7 = 0.14$

C. Debt = $8 - (4 + 2 + 1) = 1$ Equity = 4; $D/E = 1/4 = 0.25$

D. Debt = $8 - (4 + 2) = 2$ Equity = $4 + 2 = 6$; $D/E = 2/6 = 0.33$

24. On the balance sheet of last year, a company reports total assets of \$8 million, common shares (book value) of \$4 million and retained earnings of \$2 million. At the end of the current year, the net income was \$1 million, and the whole amount was retained by the firm. Everything else (each of the aforementioned accounts other than retained earnings) was held constant. The debt-to-assets ratio at the end of the current year is:

A. 0.25

B. 0.125

C. 0.75

D. 0.5

Answer: B Type: Calculation Level of Difficulty: Difficult LO: 4.3

How choices were determined:

A. Debt=8-(4+2)=2 D/A=2/8=0.25

B. Debt=8-(4+2+1)=1 Equity D/A=1/8=0.125

C. Debt=8-(4+1)=3 D/A=3/8=0.375

D. Debt=8-4=4 D/A=4/8=.5

25. Which of the following class(es) of ratios examines the relationship of borrowed funds to funds contributed by the equity holders and the ability of the firm to service its existing borrowings?

A. Profitability and activity ratios

B. Leverage and coverage ratios

C. Liquidity ratios

D. All of the above

Answer: B Type: Concept Level of Difficulty: Medium LO: 4.3

26. Which of the following class(es) of ratios examines the ability of the firm to meet its short term obligations?

A. Profitability and activity ratios

B. Leverage and coverage ratios

C. Liquidity ratios

D. All of the above

Answer: C Type: Concept Level of Difficulty: Medium LO: 4.3

27. Charles invested \$3 million in the bonds of Toys & Tots Company eight years ago. Recent recalls of the toys produced by Toys & Tots has Charles worried about whether he will receive his annual interest cheque from the firm. Which ratio(s) will most directly address Charles' concern?

I. Debt / Asset Ratio

II. Debt / Equity Ratio

III. Times Interest Earned

A. I only

B. I and II only

C. III only

D. II and III only

Answer: C Type: Concept Level of Difficulty: Difficult LO: 4.3

28. Marie invested \$3 million in 10-year bonds of the Abitibi Mills Company nine years ago. Recent changes in the industry have Marie worried about whether she will receive her principal at the end of next year. Which ratio(s) will most directly address Marie's concern?

I. Debt / Asset Ratio

II. Debt / Equity Ratio

III. Times Interest Earned

A. I only

B. I and II only

- C. III only
D. II and III only

Answer: B Type: Concept Level of Difficulty: Difficult LO: 4.3

Section 4.4 – Efficiency Ratios

29. Two firms, STM and VPL, have the same contribution margin but VPL's fixed costs (including interest) are greater than STM's. The sales of the two firms are the same. We would expect:

- A. VPL's income to have the same variability as STM
B. VPL's income to be less variable than STM
C. VPL's income to be more variable than STM
D. Can't determine, we need the relative tax rates of the firms in order to determine the income.

Answer: C. Type: Concept Level of Difficulty: Difficult LO: 4.4

How answer was determined: VPL will always have a lower earnings before taxes. With the same contribution margin, the degree of total leverage will be greater for VPL. The higher the DTL the more sensitive profits are to changes in sales. Consequently, the income of VPL will be more volatile.

30 Two firms, STM and VPL, have the same breakeven point but VPL's total sales are 50% higher than STM. We would expect:

- Fixed costs to be the same
Fixed costs of STM are higher than VPL
Contribution margins are the same
Both contribution margins and fixed costs of VPL are higher than SML

Answer: D Type: Concept Level of Difficulty: Difficult LO: 4.4

31. To produce chewing gum, the DryFruit Gum Company pays \$100,000 per year for rent on a long term lease and \$25 per kilogram for sorbitol and other ingredients. The firm pays zero taxes. These are the only costs associated with making DryFruit Gum. During the year, the firm sells 30,000 kilograms of chewing gum at \$45 per kilogram. The net profit margin for DryFruit is closest to:

- A. 120.00%
B. 55.56%
C. 44.44%
D. 37.04%

Answer: D Type: Calculation Level of Difficulty: Easy LO: 4.4

How choices were determined:

- A. Contribution margin = $30 \times (45 - 25) = \$600,000$. Net income = CM - 100 = \$500,000. Degree of total leverage = $600/500 = 1.20 \times 100\% = 120.00\%$
B. Variable costs / sales price = $25/45 = 55.56\%$
C. Contribution margin = $30 \times (45 - 25) = \$600,000$. Profit margin = $600/(30 \times 45) = 44.44\%$
D. Net income = $30 \times (45 - 25) - 100 = \$500,000$. Profit margin = $500/(30 \times 45) = 37.04\%$

32. To produce chewing gum, the DryFruit Gum Company pays \$100,000 per year for rent on a long term lease and \$25 per kilogram for sorbitol and other ingredients. The firm pays zero taxes. These are the only costs associated with making DryFruit Gum. During the year, the firm sells

30,000 kilograms of chewing gum at \$45 per kilogram. The degree of total leverage for DryFruit is closest to:

- A. 120.00%
- B. 55.56%
- C. 44.44%
- D. 37.04%

Answer: A Type: Calculation Level of Difficulty: Easy LO: 4.4

How choices were determined:

A. Contribution margin = $30 \times (45 - 25) = \$600,000$. Net income = CM - 100 = \$500,000. Degree of total leverage = $600/500 = 1.20 \times 100\% = 120.00\%$

B. Variable costs / sales price = $25/45 = 55.56\%$

C. Contribution margin = $30 \times (45 - 25) = \$600,000$. Profit margin = $600/(30 \times 45) = 44.44\%$

D. Net income = $30 \times (45 - 25) - 100 = \$500,000$. Profit margin = $500/(30 \times 45) = 37.04\%$

33. Which one of the following is NOT an efficiency ratio?

- A. Operating margin
- B. Break-even point
- C. Time interest earned
- D. Degree of total leverage

Answer: C Type: Definition Level of Difficulty: Easy LO: 4.4

34. To produce chewing gum, the DryFruit Gum Company pays \$100,000 per year for rent on a long term lease and \$25 per kilogram for sorbitol and other ingredients. The firm pays zero taxes. These are the only costs associated with making DryFruit Gum. During the year, the firm sells 30,000 kilograms of chewing gum at \$45 per kilogram. The break-even point for DryFruit is closest to:

- A. 167 kilograms.
- B. 4,000 kilograms
- C. 5,000 kilograms.
- D. 6,000 kilos

Answer: C Type: Calculation Level of Difficulty: Easy LO: 4.4

How choices were determined:

A. Contribution margin = $30 \times (45 - 25) = \$600,000$. BEP = $FC/CM = 100/600 = 166.6667$ kilograms.

B. FC / VC per unit = 4,000 kilograms

C. CM per kilo = $45 - 25 = 20$. BEP = $100/20 = 5$. BEP = 5,000 kilograms.

D. Contribution margin = $30 \times (45 - 25) = \$600,000$. BEP $\rightarrow 600/100 = 6,000$ kilos

35. Given the following information extracted from the income statement of the Widget Company (the Widget Company has no depreciation or amortization expenses),

Extract from Widget Co's income statement		
Sales:		
Unit sold	150,000	
Price per unit	\$15	
Variable cost per unit	\$8	

Fixed factory operating costs	\$450,000	
Total gross profit margin		\$600,000
Non-operating fixed costs		\$200,000
Fixed Interest costs		\$100,000
Taxes		\$75,000

The gross profit margin and operating margin for the Widget Company are closest to:

- A. GPM = 26.67%; OM = 17.78%
- B. GPM = 17.78%; OM = 26.67%
- C. GPM = 53.33%; OM = 14.44%
- D. GPM = 14.44%; OM = 53.33%

Answer: A Type: Calculation Level of Difficulty: Difficult LO: 4.4

How choices were determined:

- A. $S - \text{COGS} = 600$, $\text{GPM} = 600 / (150 \times 15) = 26.67\%$; $\text{NOI} = 600 - 200 = 400$, $\text{OM} = 400 / (150 \times 15) = 17.78\%$
- B. OM and GPM in A. reversed
- C. $\text{GPM} = 8 / 15 = 53.33\%$; $\text{NI} = 225 + 100 = 325$, $\text{OM} = 325 / (150 \times 15) = 14.44\%$
- D. OM and GPM in C. reversed

36. Given the following information extracted from the income statement of the Widget Company (the Widget Company has no depreciation or amortization expenses),

Extract from Widget Co's income statement		
Sales:		
Unit sold	150,000	
Price per unit	\$15	
Variable cost per unit	\$8	
Fixed factory operating costs	\$450,000	
Total gross profit margin		\$600,000
Non-operating fixed costs		\$200,000
Fixed Interest costs		\$100,000
Taxes		\$75,000

The degree of total leverage of the Widget Company is closest to:

- A. 2.80
- B. 3.25
- C. 3.50
- D. 4.00

Answer: C Type: Calculation Level of Difficulty: Difficult LO: 4.4

How choices determined:

- A. $\text{CM} / (\text{Non-operating fixed costs} + \text{Fixed Interest costs} + \text{taxes}) = 1050 / (300 + 75) = 2.80$
- B. $(\text{CM} - \text{taxes}) / \text{EBT} = (1050 - 75) / 300 = 3.25$
- C. Contribution margin: \$7 per unit. $\text{CM} = 7 \times 150 = 1050$. $\text{EBT} = 600 - 200 - 100 = \$300,000$. $\text{DTL} = 1050 / 300 = 3.50$
- D. $\text{EBIT} / \text{interest} = 400 / 100 = 4$

37 Given the following information extracted from the income statement of the Widget Company (the Widget Company has no depreciation or amortization expenses),

Extract from Widget Co's income statement		
Sales:		
Unit sold	150,000	
Price per unit	\$15	
Variable cost per unit	\$8	
Fixed factory operating costs	\$450,000	
Total gross profit margin		\$600,000
Non-operating fixed costs		\$200,000
Fixed Interest costs		\$100,000
Taxes		\$75,000

The break-even point for the Widget Company is:

- A. 64,286 units
- B. 107,143 units
- C. 117,857 units
- D. 500,000 units

Answer: B Type: Calculation Level of Difficulty: Difficult LO: 4.4

How choices determined:

- A. Fixed operating costs / CM = 64,286 units
- B. Contribution margin: \$7 per unit. FC = (450+200+100) = 750,000. BEP = 107,143 units
- C. FC = 450+200+100+75 = 825,000. BEP = 117,857 units
- D. Net income = 225. Net income per unit = 225/150 = 1.5. FC = 750. BEP = 750/1.5 = 500,000 units

Section 4.5 – Productivity Ratios

38. Which of the following is a productivity ratio?

- A. Times interest earned
- B. Leverage
- C. Inventory turnover
- D. Current ratio

Answer: C Type: Definition Level of Difficulty: Easy LO: 4.5

39. Inventory turnover can be calculated as:

- A. Sales/Inventory
- B. Account Receivable/Inventory
- C. Inventory/Cost of Goods sold
- D. Accounts payable/Inventory

Answer: A Type: Definition Level of Difficulty: Medium LO: 4.5

40. UUP Inc. is very conservatively managed and nothing ever changes – their sales are constant over time, the collection periods stay the same, the firm has not invested in any new assets, etc. An investor is puzzled – she has found the fixed asset turnover rate is changing over time. How

can the apparent efficiency with which the firm uses its assets be changing if sales, inventories, etc. aren't changing?

- A. This observation is impossible; she must have miscalculated something.
- B. This observation is possible; the fixed asset turnover must increase in this case due to depreciation.
- C. This observation is possible; the fixed asset turnover must decrease in this case due to depreciation.
- D. This observation is possible; she should look at net income and not sales – it is a better measure of the firm's efficiency and productivity.

Answer: B Type: Concept Level of Difficulty: Medium LO: 4.5

41. At the beginning of the year a company has \$140 in inventory and at the end of the year the inventory number on the balance sheet is \$110. If the firm reports a cost of goods sold on the income statement of \$400, then the inventory turnover ratio would be closest to:

- A. 1.60
- B. 2.86
- C. 3.20
- D. 3.64

Answer: C Type: Calculation Level of Difficulty: Easy LO: 4.5

How choices determined:

- A. $400/(140+110) = 1.60$
- B. $400 / 140 = 2.86$
- C. $400/(140+110)/2 = 400/125 = 3.20$
- D. $400/110 = 3.64$

42. The following information has been obtained on the Alberta Drilling Company for 2010:

	2010
Sales	\$135,000
Accounts receivable	\$25,000
Inventory	\$15,000
Fixed assets	\$1,100,000

The receivables turnover and average collection period for Alberta Drilling Company are:

- A. Receivables turnover: 67.59; collection period: 5.40 days
- B. Receivables turnover: 40.56; collection period: 9.00 days
- C. Receivables turnover: 9.00; collection period: 40.56 days
- D. Receivables turnover: 5.40; collection period: 67.59 days

Answer: D Type: Calculation Level of Difficulty: Medium LO: 4.5

How choices determined:

- A. RT and ACP in D. reversed
- B. RT and ACP in C. reversed
- C. $S/INV = 135 / 15 = 9$; $ADS = 365 / 9 = 40.56$
- D. $RT = 135/25 = 5.4$; $ACP = 365 / RT = 67.59$ days

43. Which one the following is TRUE?

- A. Fixed assets turnover represents the contribution of every dollar of assets to credit sales.
 B. The inverse of the inventory turnover estimates the number of days to liquidate inventory.
 C. The collection period of receivables and payables cannot be inferred from their productivity ratios.

D. Productivity ratios estimate the productivity of borrowed amounts.

Answer: B Type: Concept Level of Difficulty: Medium LO: 4.5

44. The following information has been obtained on the Alberta Drilling Company for 2011.

	2011
Sales	\$135,000
Accounts receivable	\$25,000
Inventory	\$15,000
Fixed assets	\$1,100,000

The inventory turnover and average day's sales in inventory for Alberta Drilling Company are:

- A. Inventory turnover: 67.59; Average days sales in inventory: 5.40 days
 B. Inventory turnover: 40.56; Average days sales in inventory: 9.00 days
 C. Inventory turnover: 9.00; Average days sales in inventory: 40.56 days
 D. Inventory turnover: 5.40; Average days sales in inventory: 67.59 days

Answer: C Type: Calculation Level of Difficulty: Medium LO: 4.5

How choices determined:

- A. IT and ADS in D. reversed
 B. IT and ADS in C. reversed
 C. $S/INV = 135 / 15 = 9$; $ADS = 365 / 9 = 40.56$
 D. $RT = 135/25 = 5.4$; $ACP = 365 / RT = 67.59$ days

Section 4.6 – Liquidity

45. In assessing a firm's liquidity, which of the following ratios would be most helpful?

- A. Debt Equity ratio
 B. Asset turnover ratio
 C. Current ratio
 D. Times-interest-earned ratio

Answer: C Type: Definition Level of Difficulty: Easy LO: 4.6

46. Working capital represents:

- A. The amount of money needed to start the company
 B. The difference between assets and liabilities
 C. The difference between current assets and liabilities
 D. The difference between current assets and current liabilities

Answer: D Type: Definition Level of Difficulty: Medium LO: 4.6

47. The following information was extracted from the Webb Company's financial statements:

Cash	\$500
Accounts receivable	\$300

Inventory	\$200
Current liabilities	\$700

The current ratio and quick ratio for the Webb Company are:

- A. Current ratio = 1.4286; Quick ratio = 1.1429
- B. Current ratio = 1.1429; Quick ratio = 1.4286
- C. Current ratio = 0.7143; Quick ratio = 0.4286
- D. Current ratio = 0.4286; Quick ratio = 0.7143

Answer: A Type: Definition Level of Difficulty: Easy LO: 4.6

How choices determined:

- A. Current CA/CL = $(500+300+200)/700 = 1.4286$; Quick $(C+AR)/CL = 1.1429$
- B. CR and QR in A. reversed
- C. $(300+200)/700 = .7143$; AR/CL = .4286
- D. CR and QR in C. reversed

Section 4.7 – Valuation Ratios

48. The Voyage Company is in a very high growth industry while the EZgoing Company is in a low growth industry. Comparing their dividend payout ratios we would expect:

- A. Voyage's dividend payout ratio to be greater than EZgoing.
- B. Voyage's dividend payout ratio to be less than EZgoing
- C. The two firms to have the same dividend payout ratio
- D. Can't compare them as they are in different industries.

Answer: B Type: Concept Level of Difficulty: Medium LO: 4.7

49. If a company has good growth potential, the Market to book ratio should be:

- A. Higher than 1
- B. Lower than 1
- C. Less than 0
- D. Not relevant

Answer: A Type: Concept Level of Difficulty: Medium LO: 4.7

50. In 2011, the Voyage Company had earnings per share of \$45 and paid a dividend of \$15 per share. The dividend yield was 8%. The book value per share is \$100. The dividend payout ratio was:

- A. 4.167
- B. 3.0000
- C. 0.3333
- D. 0.1500

Answer: C Type: Calculation Level of Difficulty: Easy LO: 4.7

How choices determined:

- A. Price per share = $15/.08 = \$187.5$. P/E = $187.50 / 45 = 4.167$
- B. EPS / DPS = 3.0000
- C. DPS / EPS = $15 / 45 = .3333$
- D. $15/100 = 0.1500$

51. The current stock price of the Bay James Tourism Company is \$25. Current earnings per share are \$15 and are expected to grow by 20% next year. Bay James Tourism's trailing and forward price-earnings ratios are:

- A. Trailing = 1.67; Forward = 1.39
- B. Trailing = 1.67; Forward = 1.20
- C. Trailing = 1.39; Forward = 1.67
- D. Trailing = 1.20; Forward = 1.67

Answer: A Type: Calculation Level of Difficulty: Easy LO: 4.7

How choices determined:

- A. Trailing: $25/15 = 1.6667$; Forward: $25/(15 \times 1.2) = 1.3889$
- B. Trailing: 1.6667; Forward: 1.20
- C. Trailing: 1.3889; Forward: 1.6667
- D. Trailing: 1.20; Forward: 1.6667

52. Alberta High Skies Company has net income of \$3 million. It issued 500,000 shares two years ago at an issue price of \$20 per share, and the stock is now trading at \$35 per share. What is Alberta High Skies' price-earnings ratio?

- A. \$1.75
- B. \$3.33
- C. \$5.83
- D. \$9.17

Answer: C Type: Calculation Level of Difficulty: Easy LO: 4.7

How choices determined:

- A. $\$35/20 = \$1.75$
- B. $\$20 / 6 = \$3.33$
- C. EPS: $\$3 \text{ mil} / .5 \text{ mil} = \$6$. P/E = $\$35/6 = \$5.83$
- D. \$9.17

53. The GoHabs Firm has assets and liabilities with book values of \$65 million and \$35 million respectively. The market value of the assets is \$75 million and the market value of the debt is \$40 million. If GoHabs's EBITDA is \$20 million, what is the EBITDA multiple?

- A. 0.57
- B. 0.67
- C. 1.50
- D. 1.75

Answer: D Type: Calculation Level of Difficulty: Easy LO: 4.7

How choices determined:

- A. Total enterprise value = \$35; multiple = $20/35 = .57$
- B. Multiple = $20/30 = .67$
- C. Using book values: TEV = \$30 million; multiple = $30/20 = 1.50$
- D. TEV: $\$75 - 40 = \$35$. Multiple = $\$35/20 = 1.75$

54. In 2011, the Voyage Company had earnings per share of \$45 and paid a dividend of \$15 per share. The dividend yield was 8%. The book value per share is \$100. The Price-Earnings (P/E) ratio was:

- A. 4.167

B. 3.0000

C. 0.3333

D. 0.1500

Answer: A Type: Calculation Level of Difficulty: Medium LO: 4.7

How option determined:

A. Price per share = $15 / .08 = \$187.50$. P/E = $187.50 / 45 = 4.167$

B. EPS / DPS = 3.0000

C. DPS / EPS = $15 / 45 = .3333$

D. $15 / 100 = 0.1500$

Section 4.8 – Financial Forecasting

55. Which of the following is **NOT** true?

A. In projecting financial statements, the process begins by preparing a projected income statement.

B. In preparing a projected income statement, start with a sales or revenue forecast prepared by marketing personnel.

C. The relationship between sales and some costs may be complex, for example sales and fixed costs.

D. Interest expenses are commonly based on a percentage of sales.

Answer: D Type: Concept Level of Difficulty: Easy LO: 4.8

56. Which of the following is **TRUE**?

A. Interest expenses can be predicted with a reasonable degree of accuracy, especially when the firm uses variable interest rates on debt.

B. Interest expenses are commonly based on a percentage of sales.

C. Depreciation costs are commonly based on a percentage of sales.

D. Forecasting sales is the most important step in financial forecasting.

Answer: D Type: Concept Level of Difficulty: Medium LO: 4.8

57. Which of the following is **NOT** true?

A. The relationship between cash and sales can be determined by estimating the past relationship between sales levels and cash balances.

B. Interest expenses can be predicted with a reasonable degree of accuracy, especially when the firm uses variable interest rates on debt.

C. Selling expenses are commonly based on a percentage of sales.

D. A *pro forma* income statement also has to include projected dividend payments based on the firm's established dividend policies.

Answer: B Type: Concept Level of Difficulty: Easy LO: 4.8

58. Which of the following is **NOT** a step in the financial planning process?

A. Deciding on how additional required assets will be financed.

B. Estimating various cost categories as per the income statement.

C. Preparing projected funds-flow statement.

D. Ordering supplies in anticipation of future sales.

Answer: D Type: Concept Level of Difficulty: Medium LO: 4.8

Section 4.9 – Formula Forecasting

59. The external financing requirements of a firm are a function of:

- A. Sales growth
- B. Retention ratio
- C. Profit margins
- D. All of the above

Answer: D Type: Concept Level of Difficulty: Easy LO: 4.10

60. The EXLO Company has current sales of \$100,000 and projected annual sales growth of 5%, profit margins of 3% and its dividend policy is to have a dividend payout of 15% per year. The forecasted retained earnings next year are:

- A. \$472.50
- B. \$2,677.50
- C. \$16,222.50
- D. \$91,927.50

Answer: B Type: Calculation Level of Difficulty: Medium LO: 4.10

How choices determined:

- A. $.15 \times .03 \times 1.05 \times 100,000 = \$472.50$
- B. $b \times PM \times (1+G) \times S = (1-.15) \times .03 \times (1.05) \times 100,000 = \$2,677.50$
- C. $.15 \times 1.03 \times 1.05 \times 100,000 = \$16,222.50$
- D. $(1-.15) \times 1.03 \times 1.05 \times 100,000 = \$91,927.50$

61. The EXLO Company has current sales of \$100,000 and has projected annual sales growth of 5%, asset growth of 120%, profit margins of 3% and its dividend policy is to have a dividend payout of 15% per year. The sustainable growth rate for EXLO is closest to:

- A. 0.13%
- B. 0.38%
- C. 2.17%
- D. 4.25%

Answer: C Type: Calculation Level of Difficulty: Medium LO: 4.10

How option determined:

- A. $0.85 \times .05 \times .03 = 0.13\%$
- B. $0.15 \times .03 / (1.2 - .15 \times .03) = 0.38\%$
- C. $b \times PM / (a - b \times PM) = (1-.15) \times .03 / (1.20 - (1-.15) \times .03) = .0255 / 1.1745 = 2.17\%$
- D. $0.85 \times .05 = 4.25\%$

Practice problems:

62. What are the three ratios used in the Dupont system of financial analysis of return on equity?

Type: Concept Level of Difficulty: Easy LO: 4.2

Suggested answer: $ROE = \text{Net Profit} \div \text{Shareholders' Equity}$

$= (\text{net profit} \div \text{sales}) \times (\text{sales} \div \text{total assets}) \times (\text{total assets} \div \text{shareholders' equity})$

$= \text{net profit margin} \times \text{asset turnover ratio} \times \text{leverage ratios (or equity multiplier)}$

63. Identify three potential users of financial ratios, and explain the user's focus.

Type: Concept Level of Difficulty: Medium LO: 4.2

Suggested answer:

1. Trade creditors and other suppliers are interested in establishing a company's ability to meet its short-term obligations.
2. Bondholders want to determine a business's cash-generating capacity over the long-run.
3. Financial analysts and shareholders focus on a company's present and expected cash flows, earnings and dividends.
4. Corporate executives want to measure managerial effectiveness.

64. Discuss some difficulties when comparing the ratios of similar corporations from different countries.

Type: Concept Level of Difficulty: Difficult LO: 4.1

Suggested answer:

The comparison of financial ratios of similar corporations from different countries will most likely result in very different answers. This can be partly attributed to different GAAP's and accounting conventions in the various countries. Additionally, there may be other country-specific issues such as institutional, cultural, political, and tax differences that have to be accounted for. All of these factors can have a major impact on the firm's financial ratios.

65. Enumerate the different steps in the percentage of sales method of forecasting.

Type: Concept Level of Difficulty: Difficult LO: 4.10

Suggested answer:

1. Determine which financial policy variables you are interested in.
2. Set all the non-financial policy variables as a percentage of sales.
3. Extrapolate the balance sheet based on a percentage of sales.
4. Estimate future retained earnings.
5. Modify and iterate until the forecast makes sense.

66. What is the major implication of the adoption of IFRS standards globally?

Type: Concept Level of Difficulty: Medium LO: 4.1

Suggested answer:

As more and more countries adopt the IFRS standards, the comparison of financial statements across countries will become easier. There are different accounting conventions in different countries which creates discrepancies between financial statements and limits the comparability between them. As more and more firms become international, the need of such global standard increases.

67. Discuss three issues that make the comparison of companies within the same industry group difficult.

Type: Concept Level of Difficulty: Medium LO: 4.1

Suggested answer: (Choose any three of the four)

1. Companies are becoming increasingly diversified across industry product lines, making it difficult to establish an appropriate industry classification for any company.
2. Companies are becoming increasingly diversified across geographical location, creating issues with respect to foreign currency translations.
3. Differences may exist with respect to accounting methods, size, age (or stage in the life cycle), and growth rates between companies within the same industry.

4. Some firms may have different fiscal year ends, which has the potential to affect the validity of comparisons for some ratios.

68. You are given the following information about COGS Inc., a sprocket manufacturer.

Balance Sheet:

ASSETS

Current assets:		
Cash	\$40,000	
Accounts receivable	40,000	
Inventories	<u>50,000</u>	
Total current assets		\$130,000
Fixed assets:		
Plant	\$500,000	
Equipment	150,000	
Less: Accumulated Depreciation	<u>(100,000)</u>	\$550,000
TOTAL ASSETS		<u>\$680,000</u>

LIABILITIES AND SHAREHOLDERS' EQUITY

Current liabilities:		
Short-term loan	\$100,000	
Accounts payable	75,000	
Taxes payable	<u>20,000</u>	
Total Current Liabilities		\$195,000
Long-term liabilities:		
Mortgage on plant	<u>200,000</u>	
Total Liabilities		395,000
Shareholders' equity:		
Capital stock, 20,000 common shares		\$200,000
Retained earnings	<u>85,000</u>	
Total shareholders' equity		<u>285,000</u>
TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY		<u>\$680,000</u>

Income Statement:

Revenues		\$500,000
Less:		
Cost of goods sold	\$250,000	
Salaries	150,000	
Depreciation	20,000	
Interest on loan	10,000	
Interest on mortgage	<u>20,000</u>	
Total expenses		<u>450,000</u>
Net income before taxes		50,000
Income taxes		<u>20,000</u>
Net earnings		<u>\$ 30,000</u>

a) COGS Inc. common shares are trading at \$12 per share. Calculate the following ratios:

- i) current
- ii) quick
- iii) debt-to-equity
- iv) total debt-to-assets
- v) gross operating margin
- vi) return on common equity
- vii) price-earnings

b) You have the following information about the sprocket industry. What are COGS Inc.'s relative financial and operating weaknesses?

Industry Averages

Current ratio 0.75

Quick ratio 0.52

Debt-to-equity 0.58

Total debt-to-assets 0.51

Gross operating margin 0.45

Return on common equity 0.10

Price-earnings ratio 7.00

Type: Calculation Level of Difficulty: Medium

LO: 4.3, 4.4, 4.4, 4.5, 4.6, 4.7

Suggested answer:

a)

i) current ratio = $\$130,000 \div \$195,000 = 0.67$

ii) quick ratio = $\$80,000 \div \$195,000 = 0.41$

iii) debt-to-equity = $\$200,000 \div \$285,000 = 0.70$

iv) total debt-to-assets = $\$395,000 \div \$680,000 = 0.58$

v) gross operating margin = $\$250,000 \div \$500,000 = 0.50$

vi) return on common equity = $\$30,000 \div \$285,000 = 0.11$

vii) price earnings ratio = $\$12 \div (\$30,000 \div 20,000) = 8$

b) One source of financial weakness is COGS Inc.'s reliance on short- and long-term debt. The current and quick ratios show a reliance on current liabilities, while the leverage ratios indicate a much larger use of debt financing than the industry average. Production costs seem to compensate for the excess interest payments as evidenced by the gross operating margin. Investors are willing to pay a premium for COGS Inc. common stock as shown by the price-earnings ratio.

69. Mr. B. Baggins has just computed the operating margin and the gross profit margin for the Hoppit Company and has found that the operating margin is greater than the gross profit margin. Is this possible? Why or why not? Explain your reasoning.

Type: Concept Level of Difficulty: Medium

LO: 4.4

Suggested answer:

Gross profit margin = $(\text{Sales} - \text{Cost of goods sold}) / \text{Sales}$

Operating margin = $\text{Net operating income} / \text{Sales}$

I would expect the gross profit margin to be greater than the operating margin as, usually, the net operating income is less than Sales – Cost of goods sold due to other fixed costs such as advertising, R&D etc. These costs are not included in the Cost of Goods Sold because, in the short run, they are not related to sales.

It is possible that Baggins' used EBITDA rather than NOI in his calculation. EBITDA would include investment income (i.e. income from trade credit) and therefore could be greater than Sales – COGS.

70. Zhang has observed that the sales of XYU have increased by 5% every year for the last 5 years. Zhang also found that the average collection period has increased over time while the average day's sales in inventory as decreased over the same period. Based on this information, what should Zhang conclude about the XYU Company?

Type: Concept Level of Difficulty: Difficult LO: 4.4

Suggested answer:

At first glance the company appears to be a good investment—sales have increased consistently over time. However, when we look at the average collection period and the days sales in inventory there may be cause for concern.

Increasing collection period – this suggests that the firm is extending credit to customers who may not be able to pay their debts. Essentially, the firm is selling a lot but not realizing the cash from those sales.

Decreasing average day's sales in inventory – usually this is good as it suggests an improvement in inventory management and that the firm is tying up less capital in inventory. However, if the firm is getting into financial difficulties, they may be reducing their investment in inventory excessively. This may lead to problems in the future because customers may move to other suppliers if the firm can't supply them in a timely manner.

To reach any final conclusion, we need to compare the firm to other similar firms in the industry to ask the question: "Was the firm too restrictive in giving credit before?" If yes, then the increase in the collection period is not a problem. And the firm is not inefficient in managing inventory (hence decrease in days sales is not a problem).

71. (Difficult, Calculation) Complete the following income statement based on the information provided below:

Sales	\$_____	
Less:		
Cost of goods sold	\$_____	
Administration costs	_____	
Interest	_____	
Net income before taxes		_____
Income taxes		_____
Net earnings	\$_____	

The selected values are given as follows:

Gross operating margin 24%

Net operating margin 20%

Asset turnover 0.8

Return on common equity 10%

Tax rate 40%

Tangible assets \$15,000

Net worth \$12,000

Preferred shares 0

Type: Calculation Level of Difficulty: Difficult LO: 4.10

Suggested answer:

Sales = Asset turnover $\times$ Tangible assets = $0.8 \times \$15,000 = \$12,000$

Less:

Cost of goods sold = Sales – (Sales $\times$ Gross operating margin)
 $= \$12,000 - (\$12,000 \times 0.24) = \$9,120$

Administration costs = Sales – COGS – (Sales $\times$ Net Operating Margin)
 $= \$12,000 - \$9,120 - (\$12,000 \times 0.2) = \$480$

Interest = Sales – COGS – Admin. – Net income before taxes
 $= \$12,000 - \$9,120 - \$480 - \$2,000 = \$400$

Net income before taxes = Net earnings $\div$ (1 – Tax rate)
 $= \$1,200 \div (1 - 0.4) = \$2,000$

Income taxes = Net income – Net earnings
 $= \$2,000 - \$1,200 = \$800$

Net earnings = Net worth $\times$ Return on common equity
 $= \$12,000 \times 10\% = \$1,200$

72. In 2010, Inglis Arctic Sports (IAS) had total sales of \$35 million. The firm earned \$3.00 per share and paid dividends of \$1.00 per share. There are 1 million shares currently outstanding. The 2010 year-end balance sheet is shown below:

Inglis Arctic Sports
 Consolidated Balance Sheet
 (at year end in thousands of dollars)

	2010	2011
Assets		
Cash	\$ 4,800	
Accounts Receivable	2,800	
Inventory	3,400	
Gross Fixed Assets	25,000	
Less: Accumulated Depreciation	(8,000)	

Net Fixed Assets	17,000	
Total Assets	<u>\$28,000</u>	
Liabilities and Equity		
Accounts Payable	\$ 2,400	
Accrued Wages	4,300	
Notes Payable	1,500	
Long Term Debt	8,200	
Common Shares	3,400	
Retained Earnings	8,200	
Total Liabilities and Equity	<u>\$28,000</u>	

You are a financial analyst with IAS and have been asked to prepare a financial plan for next year. You have been given the following information and projections for 2011 from the marketing and production departments:

- Sales are projected to grow by 15 percent in 2011.
- New capital expenditures will be \$3.75 million for the replacement of a production line.
- A depreciation expense of \$1,200,000 will be recorded in 2011.
- The new more efficient production line is expected to reduce inventory to 7.5 percent of sales in 2011.
- The management would like to achieve a total debt-to-equity ratio of 1.0 in 2011, while keeping long-term debt unchanged from 2010.
- Management expects the net profit margin and dividend payout ratios to remain the same as in 2010.

Forecast the 2011 balance sheet for IAS.

Type: Calculation Level of Difficulty: Difficult LO: 4.10

Suggested answer:

First, you find the additions to retained earnings.

Net income (last year) = EPS $\times$ number of shares outstanding = \$3 $\times$ 1 mil. = \$3 million

Reinvestment rate = $1 - (\text{Div} \div \text{EPS}) = 1 - (1 \div 3) = 0.67$

Profit Margin = last year's net income $\div$ last year's sales = \$3 million $\div$ \$35 million = 8.57%

Projected additions to R/E = profit margin $\times$ projected sales $\times$ reinvestment rate
 $= (0.0857) \times (\$35 \text{ million} \times 1.15) \times (0.67) = \$2.31112 \text{ million}$

Using the debt-to-equity ratio requirement,

Accounts payable in 2011 = AP in 2010 increased by 15% (have to assume it grows at same rate as sales) = \$2,400 $\times$ 1.15 = \$2,760

Accrued wages are also assumed to grow at 15% (same rate as sales) = \$4,945

Long term debt is unchanged at \$8,200

Total Debt $\div$ EQ = 1.0 = (AP + AW + NP + LTD) $\div$ (CS + R/E)

$$1.0 = (\$2,760 + \$4,945 + NP + \$8,200) \div (CS + \$10,511)$$

$$CS + 10,511 = 15,905 + NP$$

$$\$5,394 + NP - CS = 0 \quad (1)$$

Since the balance sheet has to balance, you have

$$\text{Total assets} = AP + AW + NP + LTC + CS + R/E$$

$$31,945 = 2,760 + 4,945 + NP + 8,200 + CS + 10,511$$

$$5,529 = NP + CS \quad (2)$$

Using (1) we find $CS = 5,394 + NP$

Substituting into (2) we find:

$$5,529 = NP + (5,394 + NP)$$

$$2 NP = \$135 \text{ therefore } NP = \$67.5 \text{ or } \$68 \text{ (rounded up by } \$0.50)$$

$$CS = \$5,394 + \$67.5 = \$5,461.50 \text{ or } \$5,461 \text{ (rounded down by } \$0.50 \text{ to balance sheet)}$$

Inglis Arctic Sports
Consolidated Balance Sheet
(At year end in thousands of dollars)

	2010	Change	2011
Assets			
Cash	\$ 4,800	+15%	\$ 5,520
Accounts Receivable	2,800	+15%	3,220
Inventory	3,400	+7.5%	3,655
Gross Fixed Assets	25,000	+\$3.75 mil	28,750
Less: Accumulated Depreciation	<u>(8,000)</u>	+\$1,200 dep	<u>(9,200)</u>
Net Fixed Assets	17,000		19,550
Total Assets	<u>\$28,000</u>		<u>\$31,945</u>
Liabilities and Equity			
Accounts Payable	\$ 2,400	+15%	\$ 2,760
Accrued Wages	4,300	+15%	4,945
Notes Payable	1,500	See above	68
Long Term Debt	8,200	Fixed	8,200
Common Shares	3,400	See above	5,461
Retained Earnings	8,200	+\$2.311 mil.	10,511
Total Liabilities and Equity	<u>\$28,000</u>		<u>\$31,945</u>

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Chapter 5: Time Value of Money

Multiple Choice Questions

Section 5.1 – Opportunity Cost

1. Charles has \$12,000 to invest. Charles' bank offers him the following investment accounts:

Account	Interest rate	Minimum balance
#1	1%	\$0
#2	3%	\$5,000
#3	5%	\$10,000
#4	8%	\$20,000

Assuming that all the accounts have the same risk as the investment, Charles' opportunity cost is closest to:

- A. 1%
- B. 3%
- C. 5%
- D. 8%

Answer: C

Type: Concept

Level of Difficulty: Easy

LO: 5.1

2. If Frank is indifferent between receiving \$1,000 today and \$1,200 in one year, his opportunity cost must be close to:

- A. 1.20%
- B. 20%
- C. 120%
- D. 200%

Answer: B

Type: Concept

Level of Difficulty: Easy

LO: 5.1

3. Which one of the following is/are an example(s) of opportunity cost?

- A. Quitting your job to go to college.
- B. Using a piece of land that you owned to build a house.
- C. Spending time caring about an elder in your family instead of working.
- D. All of the above are examples of opportunity costs.

Answer: D

Type: Concept

Level of Difficulty: Medium LO: 5.1

4. Why is a dollar today always worth at least a dollar in the future?

- A. Because of the risk involved with investing
- B. Because of the opportunity cost of money
- C. Because of inflation
- D. All of the above

Answer: D

Type: Concept

Level of Difficulty: Medium LO: 5.1

Section 5.2 – Simple Interest

5. Earl has invested \$12,000 in a security that pays 2% annual simple interest. How much interest does he earn in the 3rd year?

- A. \$160

- B. \$240
C. \$720
D. \$12,735

Answer: B Type: Concept Level of Difficulty: Easy LO: 5.2

Explanation:

- A. $480/3 = \$160$
B. $12000 \times .02 = \$240$
C. $240 \times 3 = \$720$

D. $1 + 0.023 \times 12000 = 12734.5$

Section 5.3 – Compound Interest

6. Consider two investments: XPD and PDQ. Each investment pays interest at the end of each year and the interest rate does not change over time. The interest earned each year is given below:

YEAR	PDQ	XPD
1	100	50.00
2	100	52.50
3	100	55.13
4	100	57.88

Which of the following statements is (are) most correct?

- A. PDQ and XPD earn simple interest
B. PDQ earns simple interest, XPD earns compound interest
C. PDQ earns compound interest, XPD earns simple interest
D. PDQ and XPD earn compound interest

Answer: B Type: Concept Level of Difficulty: Easy LO: 5.3

7. A mortgage payment is calculated using the interest on the remaining balance of the capital payment of every month, whereas interest paid on a line of credit is deducted from your account every month. So, mortgage payments are calculated using _____ where line of credit interest is calculated using _____:

- A. Simple interest, compound interest
B. Compound interest, simple interest
C. Simple interest, simple interest
D. Compound interest, compound interest

Answer: B Type: Concept Level of Difficulty: Medium LO: 5.3

8. The present value is always _____ than the future value if the opportunity cost is _____ zero.

- A. Less than; greater than
B. Equal to; equal to

- C. Greater than; less than
- D. All of the above are true

Answer: D Type: Concept Level of Difficulty: Medium LO: 5.3

9. As interest rates fall, present values:

- A. increase.
- B. decrease.
- C. stay the same.
- D. Cannot determine, need compounding frequency

Answer: A Type: Concept Level of Difficulty: Easy LO: 5.3

10. As interest rates rise, future values:

- A. increase.
- B. decrease.
- C. stay the same.
- D. Cannot determine, need compounding frequency

Answer: A Type: Concept Level of Difficulty: Easy LO: 5.3

11. You invested \$2,000 at 5 percent compounded annually. Determine the value of the investment in five years. (Round your answer to two decimals.)

- A. \$500.00
- B. \$552.56
- C. \$2,500.00
- D. \$2,552.56

Answer: D Type: Calculation Level of Difficulty: Easy LO: 5.3

Explanation:

A. $2000 \times 5 \times .05$

B. $2000 \times 1.055 - 2000 = 552.56$

C. $2000 \times 5 \times .05 + 2000$

D. $2000 \times 1.055 = 2552.56$

12. You invested \$2,000 at 5 percent compounded annually. Determine how much interest was earned in the fifth year? (Round your answer to two decimals.)

- A. \$100.00
- B. \$121.55
- C. \$500.00
- D. \$552.56

Answer: B Type: Calculation Level of Difficulty: Medium LO: 5.3

Explanation:

A. $2000 \times 0.05 = 100$

B. $2000 \times 1.055 - 1.054 = 121.55$

C. $2000 \times 5 \times 0.05 = 500$

D. $2000 \times 1.055 - 2000 = 552.56$

13. The current interest rate is 3.04 percent. If the interest rate increases by 10 basis points, the new interest rate will be: (your answer should be rounded to two decimals)

A. 2.94%

B. 3.03%

C. 3.05%

D. 3.14%

Answer: D Type: Definition Level of Difficulty: Easy LO: 5.3

14. Franklin needs to have \$1,000 in 8 years. If his investment earns 5 percent compounded annually, how much must he invest today? (Round your answer to two decimals.)

A. \$676.84

B. \$680.58

C. \$1,477.46

D. \$1,469.33

Answer: A Type: Calculation Level of Difficulty: Easy LO: 5.3

$$1000 * 1.05^{-8} = 676.8394$$

$$1000 * 1.08^{-5} = 680.5832$$

$$1000 * 1.05^8 = 1477.4554$$

$$1000 * 1.08^5 = 1469.3281$$

D.

15. Eduardo bought a house for \$120,000 five years ago. He has just sold it for \$180,000. What annual rate of return did he earn on this investment?

A. 10%

B. 8.45%

C. 1.08%

D. 3.13%

Answer: B Type: Calculation Level of Difficulty: Easy LO: 5.3

Explanation:

A. $(180000/120000 - 1) / 5 = 10\%$

B. $(180000/120000)^{1/5} - 1 = 8.45\%$

C. $(180000/120000)^{1/5} = 1.08$

D. $(180000/120000 - 1)^5 = 3.13\%$

16. Gianni invested \$10,000 at a rate of 6% compounded annually. How long will it take for the investment to grow to \$40,000?

- A. 1.33 years
- B. 4.00 years
- C. 23.79 years
- D. 50.00 years

Answer: C Type: Calculation Level of Difficulty: Medium LO: 5.3

Explanation:

- A. $\ln(4/1.06) = 1.3280$ years
- B. $40/10 = 4$ years
- C. $\ln(4)/\ln(1.06) = 23.79$ years
- D. $(30/10)/.06 = 50$ years

17. Ingrid has invested \$10,000 in a Guaranteed Investment Certificate that promises her 12% per year for the first 5 years and 4% per year for the next 10 years. The interest is compounded annually. At the end of the 15 years, the value of the investment will be closest to which value? (Your answer should be rounded to two decimals)

- A. \$26,086.96
- B. \$31,721.69
- C. \$32,425.86
- D. \$36,372.55

Answer: A Type: Calculation Level of Difficulty: Medium LO: 5.3

$$10,000 * 1.12^5 * 1.04^{10} = 26086.9620$$

$$10000 \left(1 + \frac{0.12 + 0.04}{2} \right)^{15} = 31721.6911$$

$$10000(1.12^5 + 1.04^{10}) = 32425.8597$$

$$10000 \left(\frac{1.12^{15} + 1.04^{15}}{2} \right) = 36372.5463$$

D.

Section 5.4 – Annuities and Perpetuities

18. Elie is considering an investment that will require her to deposit \$500 per month for 6 years with the first payment occurring today. This is an example of:

- A. an ordinary annuity.
- B. an annuity due.
- C. a reverse ordinary annuity.
- D. a reverse annuity due.

Answer: B Type: Definition Level of Difficulty: Easy LO: 5.4

19. At the age of 65 your grandfather decides to retire and use the money he saved in his RRSPs. He decided to get a fixed amount every quarter starting the day he retires. What type of payment is this?

- A. an ordinary annuity
- B. an annuity due
- C. a reverse ordinary annuity
- D. a reverse annuity due

Answer: B Type: Definition Level of Difficulty: Easy LO: 5.4

20. Consoles are British bonds that were issued during the 18th century that pay a constant coupon and are irredeemable. What type of payment is this?

- A. an ordinary annuity
- B. an annuity due
- C. a perpetuity
- D. None of the above

Answer: C Type: Definition Level of Difficulty: Easy LO: 5.4

21. The Montreal Financial Services Company offers a perpetuity of \$50,000 per year with the first payment on January 1, 2010. If your opportunity costs are constant over time, the price you are willing to pay for this perpetuity _____ over time.

- A. increases
- B. decreases
- C. stays the same
- D. can't determine without the opportunity cost

Answer: C Type: Concept Level of Difficulty: Medium LO: 5.4

22. The Montreal Financial Services Company offers a 50 year annuity of \$50,000 per year with the first payment on January 1, 2010. If your opportunity costs are constant over time, the price you are willing to pay for this annuity _____ over time.

- A. increases
- B. decreases
- C. stays the same

D. can't determine without the opportunity cost

Answer: B Type: Concept Level of Difficulty: Medium LO: 5.4

23. The Montreal Financial Services Company offers a perpetuity of \$5,000 per year with the first payment in one year. If your opportunity cost is 8% compounded annually. The present value of the perpetuity today is:

- A. 57,500
- B. 62,500
- C. 67,500
- D. 125,000

Answer: B Type: Calculation Level of Difficulty: Easy LO: 5.4

Explanation:

- A. $(5,000 / .08) - 5000 = 57,500$
- B. $5,000 / .08 = 62,500$
- C. $(5,000 / .08) + 5000 = 67,500$
- D. $5,000 / .04 = 125,000$

24. The Montreal Financial Services Company offers a perpetuity of \$5,000 per year with the first payment immediately. If your opportunity cost is 8% compounded annually. The present value of the perpetuity today is:

- A. 57,500
- B. 62,500
- C. 67,500
- D. 125,000

Answer: C Type: Calculation Level of Difficulty: Easy LO: 5.4

Explanation:

- A. $(5,000 / .08) - 5000 = 57,500$
- B. $5,000 / .08 = 62,500$
- C. $(5,000 / .08) + 5000 = 67,500$
- D. $5,000 / .04 = 125,000$

25. Elvira is considering buying a 20 year ordinary annuity to provide her with retirement income. The annuity will make annual payments of \$25,000. If her opportunity cost is 7%, what is the maximum she should pay for the annuity?

- A. \$1,096,629.42
- B. \$1,024,887.31
- C. \$283,389.88
- D. \$264,850.36

Answer: D Type: Concept Level of Difficulty: Medium LO: 5.4

Explanation:

- A. $N=20, I/Y=7, PMT = 25,000, \text{due}, FV = \$1,096,629.420$
- B. $N=20, I/Y = 7, PMT = 25,000, \text{ordinary}, FV = \$1,024,887.308$
- C. $N= 20, I/Y = 7, PMT = 25,000, \text{Due}, PV = \$283,389.88$
- D. $N=20, I/Y=7, PMT = 25,000, \text{ordinary}, PV = \$264,850.3561$

26. Xiang invests \$25,000 per year, starting today, for 20 years at an interest rate of 7%. What is the value of the investment at the end of the 20 years?

- A. \$1,096,629.42
- B. \$1,024,887.31
- C. \$283,389.88
- D. \$264,850.36

Answer: A Type: Calculation Level of Difficulty: Easy LO: 5.4

Explanation:

- A. $N=20, I/Y=7, PMT = 25,000, \text{due}, FV = \$1,096,629.420$
- B. $N=20, I/Y = 7, PMT = 25,000, \text{ordinary}, FV = \$1,024,887.308$
- C. $N= 20, I/Y = 7, PMT = 25,000, \text{Due}, PV = \$283,389.88$
- D. $N=20, I/Y=7, PMT = 25,000, \text{ordinary}, PV = \$264,850.3561$

27. Marie is considering investing a part of her future income in a investment account that offers 0.5 percent a month. She will start work in 6 months and her contract extends for 2 years. If the investment amount is 300 dollars a month, what is the present value of this investment?

- A. \$ 6768.86
- B. \$ 8338.22
- C. \$ 6569.30
- D. \$ 8903.62

Answer: C Type: Calculation Level of Difficulty: Medium LO: 5.4

Explanation:

- A. $N=24, I/Y=0.5, PMT=300, PV=\$ 6768.86$
- B. $N=30, I/Y=0.5, PMT=300, PV=\$ 8338.22$
- C. $N=24, I/Y=0.5, PMT=300, PV1=\$ 6768.86, PV=PV1*((1+0.5\%)^{-6})=\$ 6569.30$
- D. $N=30, I/Y=0.05, PMT=300, PV=\$ 8930.6204$

28. Elvira is considering buying a 20 year annuity due to provide her retirement income. The annuity will make annual payments of \$25,000. If her opportunity cost is 7%, what is the present value of the annuity?

- A. \$1,096,629.42
- B. \$1,024,887.31
- C. \$283,389.88
- D. \$264,850.36

Answer: C Type: Calculation Level of Difficulty: Easy LO: 5.4

Explanation:

- A. $N=20, I/Y=7, PMT = 25,000, \text{due}, FV = \$1,096,629.420$
- B. $N=20, I/Y = 7, PMT = 25,000, \text{ordinary}, FV = \$1,024,887.308$
- C. $N= 20, I/Y = 7, PMT = 25,000, \text{Due}, PV = \$283,389.88$
- D. $N=20, I/Y=7, PMT = 25,000, \text{ordinary}, PV = \$264,850.3561$

29. Xiang invests \$25,000 per year, starting in one year, for 20 years at an interest rate of 7%. What is the value of the investment at the end of the 20 years?

- A. \$1,096,629.42
- B. \$1,024,887.31
- C. \$283,389.88

D. \$264,850.36

Answer: B Type: Calculation Level of Difficulty: Easy LO: 5.4

Explanation:

A. N=20, I/Y=7, PMT = 25,000, due, FV = \$1,096,629.420

B. N=20, I/Y = 7, PMT = 25,000, ordinary, FV = \$1,024,887.308

C. N= 20, I/Y = 7, PMT = 25,000, Due, PV = \$283,389.88

D. N=20, I/Y=7, PMT = 25,000, ordinary, PV = \$264,850.3561

30. Your mother has just retired. The balance in her investment account is \$600,000 and she wants to receive monthly payments of \$5,000. If she receives the payments at the end of the month, and the current interest rate is 7 percent, compounded quarterly, how many months will her investment account last for?

A. 98 months

B. 120 months

C. 170 months

D. 206 months

Answer: D Type: Calculation Level of Difficulty: Medium LO: 5.4

Explanation:

A. 98 months

$$(1 + 0.07/4)^{\frac{1}{4}} - 1 = 0.4347\%$$

$$(1 + 0.07/4)^{\frac{1}{3}} - 1 = 0.58\%$$

D. Effective monthly rate = ; N=?, I=.58, PV = 600,000, PMT = 5,000 → N = 205.89 months

31. Felix has been offered a 3 year ordinary annuity with annual payments of \$1,500. The price of the annuity is \$2,700. Which of the following is the most appropriate time line for this investment?

Answer: A Type: Definition Level of Difficulty: Easy LO: 5.4

32. Which of the following is the most appropriate time-line for the cash flows of a 3 year annuity due with annual cash flows of \$5,000?

Answer: B Type: Definition Level of Difficulty: Easy LO: 5.4

Section 5.5 – Nominal vs Effective Rates

33. To compare interest rates, we should compare the:

A. Quoted rates

B. Nominal rates

C. Effective rates

D. Periodic rates

Answer: C Type: Concept Level of Difficulty: Easy LO: 5.5

34. For a given quoted rate, the effective annual rate _____ as the compounding frequency increases.

A. Does not change

B. Increases

C. Decreases

D. There is no connection between the effective annual rate and the quoted rate.

Answer: B Type: Concept Level of Difficulty: Medium LO: 5.5

35. You have been offered four different financing schemes for a \$30,000 car. Which one should you choose?

A. \$5,000 down with the rest paid in equal monthly payments of \$624.70 per month for 48 months.

B. \$0 down with equal monthly payments of \$960 per month for 36 months.

C. \$15,000 down and a final payment of \$18,550 two years from now.

D. Have it financed with a bank loan at an APR of 9.5% with loan repayments made monthly.

Answer: A Type: Calculation Level of Difficulty: Medium LO: 5.5

Explanation:

A. $PV = -\$25,000$ $N=48$ $FV=0$ $PMT = \$624.70$, $CPT I = 0.768\%$; $EAR = 9.62\%$

B. $PV = -\$30,000$ $N=36$ $FV=0$ $PMT = \$960$, $CPT I = 0.7858\%$ per month; $EAR = 9.85\%$

C. $PV = -\$15,000$ $N=2$ $PMT = 0$ $FV = \$18,550$, $CPT I = EAR = 11.2055\%$

D. $APR = 9.5\%$, $EAR = 9.92\%$

36. For a given effective annual rate, the quoted rate _____ as the compounding frequency increases.

A. Does not change

B. Increases

C. Decreases

D. There is no connection between the effective annual rate and the quoted rate.

Answer: C Type: Concept Level of Difficulty: Difficult LO: 5.5

37. The R&M Bank has offered you the choice between two investment accounts:

#1 pays interest at a rate of 12% compounded semi-annually

#2 pays interest at a rate of 11% compounded monthly

Which investment account do you prefer and why?

A. #1, 12% is greater than 11%

B. #2, greater compounding frequency

C. #1, highest effective rate

D. #2, highest effective rate

Answer: C Type: Concept Level of Difficulty: Easy LO: 5.5

Explanation:

#1 effective annual rate: 12.36%

#2 effective annual rate: 11.57%

38. The R&M Bank has offered you the choice between two loans:

#1 charges interest at a rate of 9% compounded quarterly

#2 charges interest at a rate of 9.05% compounded semi-annually

Which loan do you prefer and why?

A. #1, lowest effective rate

B. #2, lowest effective rate

C. #1, highest effective rate

D. #2, highest effective rate

Answer: B Type: Concept Level of Difficulty: Easy LO: 5.5

Explanation:

#1: effective annual rate: 9.31%

#2: effective annual rate: 9.25%

39. Your investment account has an interest rate of 10% compounded semi-annually. This is the equivalent of an effective annual interest rate of:

A. 1.1025%

B. 5%

C. 10%

D. 10.25%

Answer: D Type: Calculation Level of Difficulty: Easy LO: 5.5

$$1.05^2 = 1.1025$$

A.

B. 10%/2

$$1.05^2 - 1 = 10.25\%$$

D.

40. Your credit card has a quoted rate of 17% compounded weekly. What is the effective annual rate?

A. 884%

B. 18.50%

C. 32.69%

D. 17.00%

Answer: B Type: Calculation Level of Difficulty: Easy LO: 5.5

Explanation

$$\left(1 + \frac{0.17}{52}\right)^{52} - 1 = 18.4976\%$$

B.

C. $(.17/52)*100 = 32.69\%$

D. 17%

41. Your credit card has a quoted rate of 18.5 percent compounded daily. What is the effective annual rate? (Assume 360 days a year)

- A. 66.60%
- B. 20.32%
- C. 51.39%
- D. 18.50%

Answer: B

Type: Calculation

Level of Difficulty: Easy

LO: 5.5

Explanation

$$\left(\frac{0.185}{360} + 1\right)^{360} - 1 = 20.32\%$$

B.

C. $(.185/360)*1000 = 51.39\%$

42. Your investment account pays interest at a rate of 8% compounded semi-annually. If you deposit \$1,000 today, how much will you have in two years?

- A. \$1,081.60
- B. \$1,166.40
- C. \$1,169.86
- D. \$1,360.49

Answer: C

Type: Calculation

Level of Difficulty: Easy

LO: 5.5

$$1000(1 + 0.08/2)^2 = 1081.60$$

$$1000(1 + 0.08)^2 = 1166.40$$

$$1000(1 + 0.08/2)^4 = 1169.86$$

$$1000(1 + 0.08)^4 = 1360.49$$

D.

43. Eloise has deposited \$2,000 in a investment account that pays 5% compounded continuously. How much will she have in her account in 2 years?

- A. \$2,205.00
- B. \$2,210.34
- C. \$2,105.54
- D. \$1,809.67

Answer: B

Type: Calculation

Level of Difficulty: Easy

LO: 5.5

$$2000 * 1.05^2 = 2205.00$$

$$2000 * e^{0.05*2} = 2210.34$$

$$2000 * e^{0.5} = 2102.54$$

$$2000 * e^{-0.05*3} = 1809.67$$

D.

44. Valentino will receive \$25,000 in 3 years. His opportunity cost is 8% compounded continuously. The present value of this cash flow is closest to:

- A. \$31,781.23
- B. \$31,492.80
- C. \$19,845.81
- D. \$19,665.70

Answer: D

Type: Calculation

Level of Difficulty: Easy

LO: 5.5

$$250000 * e^{0.08*3} = 31781.23$$

$$250000 * 1.08^3 = 31492.80$$

$$250000 * 1.08^{-3} = 19845.81$$

$$250000 * e^{-0.08*3} = 19655.70$$

D.

45. Wilma borrows \$10,000 from “Jaw Breaker Joe” and promises to repay Joe a total of \$10,500 in one month. What is the effective annual interest rate charged by Joe?

- A. 5.00%
- B. 60.00%
- C. 79.59%
- D. 179.59%

Answer: C

Type: Calculation

Level of Difficulty: Medium LO: 5.5

Explanation:

A. $500/10000 = 5\%$

$$1.05^{12} - 1 = 79.59\%$$

$$1.05^{12} = 179.59\%$$

D.

46. The R&M Bank currently offers a investment account with an interest rate of 8% compounded semi-annually. R&M wants to offer customers another account with interest compounded monthly. If R&M wants the effective rates to be equal, what interest rate should R&M quote for the second account?

- A. 7.87%
- B. 8.00%
- C. 8.16%
- D. 24.00%

Answer: A

Type: Calculation

Level of Difficulty: Difficult LO: 5.5

$$1.0816 = \left(1 + \frac{X}{12}\right)^{12} \quad X = 7.87\%$$

A.

$$\left(1 + \frac{0.08}{2}\right)^2 - 1 = 8.16\%$$

$$\left(\frac{0.08}{2}\right)^*6 = 24\%$$

D.

47. How much should a weekly compounded account with an EAR of 10% earn semiannually?

A. 4.88%

B. 5.00%

C. 4.76%

D. 5.11%

Answer: A

Type: Calculation

Level of Difficulty: Medium LO: 5.5

Explanation:

A. $1 + 10\% / 12 - 1 = 0.83\%$

B. $10 / 2 = 5\%$

C. 4.76%

D. $1 + 10\% / 12 - 1 = 0.83\%$

48. How much should a weekly compounded account with an APR of 10% earn semiannually?

A. 4.88%

B. 5.00%

C. 5.36%

D. 5.12%

Answer: D

Type: Calculation

Level of Difficulty: Medium LO: 5.5

Explanation:

A. $1 + 10\% / 12 - 1 = 0.83\%$

B. $10 / 2 = 5\%$

C. 5.36%

D. $1 + 10\% / 5226 - 1 = 5.122\%$

49. How much should a monthly compounded account with an APR of 18% earn semiannually?

A. 2.80%

B. 3.00%

C. 2.77%

D. 9.34%

Answer: D

Type: Calculation

Level of Difficulty: Medium LO: 5.5

Explanation:

A. $1 + 18\% / 1183 - 1 = 2.80\%$

B. $18 / 6 = 3\%$

$$1 + \left(\frac{18}{12} \right)^6 - 1 = 9.34\%$$

D.

50. The R&M Bank currently offers a investment account with an interest rate of 6% compounded monthly. R&M wants to offer customers another account with interest compounded quarterly. If R&M wants the effective rates to be equal, what interest rate should R&M quote for the second account?

A. 2.00%

B. 6.00%

C. 6.03%

D. 6.17%

Answer: C

Type: Calculation

Level of Difficulty: Difficult LO: 5.5

Explanation:

A. $(.06/12) * 4 = 2\%$

$$\left[\left(1 + \frac{0.06}{12} \right)^3 - 1 \right] * 4 = 6.03\%$$

$$\left[\left(1 + \frac{0.06}{12} \right)^{12} - 1 \right] = 6.17\%$$

D. (effective annual rate)

Section 5.6 – Loan or Mortgage Arrangements

51. Lucy has just obtained a 5 year fixed rate mortgage to buy her first home. The mortgage is amortized over 30 years. Which of the following statements is most correct?

- A. Lucy's payments won't change for the next 30 years.
- B. Lucy's payments won't change for the next 5 years.
- C. Lucy's payments will increase as the term of the mortgage increases.
- D. Lucy's payments will decrease as the term of the mortgage increases.

Answer: B Type: Concept Level of Difficulty: Medium LO: 5.6

52. As the amortization period of a mortgage increases, holding interest rates constant, the monthly payments will:

- A. Stay the same.
- B. Increase.
- C. Decrease.
- D. There is no connection between the amortization period and the size of the payment.

Answer: C Type: Concept Level of Difficulty: Difficult LO: 5.6

53. As the term of a mortgage increases, holding interest rates constant, the monthly payments will:

- A. Stay the same
- B. Increase
- C. Decrease
- D. There is no connection between the term and the size of the payments

Answer: D Type: Concept Level of Difficulty: Difficult LO: 5.6

54. Amir has obtained a \$250,000 mortgage. The mortgage is amortized over 25 years and the term of the mortgage is 5 years. The mortgage interest rate is 9% compounded semi-annually. Amir will begin making monthly payments at the end of the month. The monthly payment is closest to:

- A. \$2,069.94
- B. \$2,097.99
- C. \$5,169.68
- D. \$5,189.59

Answer: A Type: Calculation Level of Difficulty: Difficult LO: 5.6

$$(1 + .09/2)^{1/2} - 1 = .7363\%$$

Effective monthly interest rate: .

- A. Monthly payments: $N=25*12$, $I/Y = .7363$, $PV=250000$, $PMT = 2069.9435$
- B. Monthly payments: $N=25*12$, $I/Y=9/12$, $PV =250,000$, $PMT=2097.99$
- C. Monthly payments: $N=5*12$, $I/Y = .7363$, $PV=250000$, $PMT = 5169.68$
- D. Monthly payments: $N=5*12$, $I/Y=9/12$, $PV =250,000$, $PMT=5189.59$

55. Amir has obtained a \$250,000 mortgage. The mortgage is amortized over 25 years and the term of the mortgage is 25 years. The mortgage interest rate is 9% compounded annually. Amir

will begin making annual payments of \$25,451.56 at the end of the year. What is the principal outstanding immediately after Amir makes his third payment?

- A. \$50,903.12
- B. \$173,645.32
- C. \$185,574.60
- D. \$240,324.46

Answer: D Type: Calculation Level of Difficulty: Medium LO: 5.6

Explanation:

Annual payments: $N=25$, $I=9$, $PV = 250,000 \rightarrow PMT = \$25,451.5626$.

- A. $2 * \text{payments} = 50,903.12$
- B. $250,000 - 3 * \text{annual: } 173,645.32$
- C. $250,000 - PV \text{ of } 3 \text{ payments} = 250,000 - 64,425.40 = 185,574.6019$
- D. $PV \text{ of } 22 \text{ remaining payments} = 240,324.4577$

56. Amir has obtained a \$250,000 mortgage. The mortgage is amortized over 25 years and the term of the mortgage is 25 years. The mortgage interest rate is 9% compounded annually. Amir will begin making annual payments of \$25,451.56 at the end of the year. How much of Amir's third payment is interest?

- A. \$22,500.00
- B. \$21,944.81
- C. \$18,470.51
- D. \$2,290.64

Answer: B Type: Calculation Level of Difficulty: Medium LO: 5.6

Explanation:

Annual payments: $N=25$, $I=9$, $PV = 250,000 \rightarrow PMT = \$25,451.56$.

- A. $.09 * 250,000 = 22500$
- B. $.09 * PV \text{ of } 23 \text{ payments} = .09 * 243,831.2341 = 21,944.81$
- C. $(250000 - PV \text{ of } 2 \text{ payments}) * .09 = (250000 - 44772.1285) * .09 = 18,470.5084$
- D. $.09 * 25451.56 = 2,290.64$

Section 5.7 – Comprehensive Examples

57. An investment pays \$1,000 per year for the first 4 years and \$2,000 per year for 6 years following. If the required rate of return is 8 percent compounded annually, how much is this investment worth?

- A. \$12,557.89
- B. \$10,108.04
- C. \$9,604.64
- D. \$9,138.52

Answer: B Type: Calculation Level of Difficulty: Medium LO: 5.3

Explanation

$$3312.1268 + 9245.7593 / 1.08^4 = 10108.0359$$

$$3312.1268 + 9245.7593 / 1.08^5 = 9604.6352$$

C.

$$3312.1268 + 9245.7593 / 1.08^6 = 9138.5235$$

D.

58. An investment pays \$2,000 every second year for 20 years (a total of 10 payments). Your opportunity cost is 8% compounded semi-annually. The present value of this investment is:

- A. \$9,322.00
- B. \$9,666.46
- C. \$13,323.85
- D. \$19,636.29

Answer: A

Type: Calculation

Level of Difficulty: Difficult LO: 5.3

$$(1 + 0.08/2)^{2 \times 20} - 1 = 16.9859\%$$

A. N=10, I=, PMT = \$2000, PV = 9322.0024

$$(1 + 0.08/2)^2 - 1 = 8.16\%$$

C. N=10, I=, PMT = 2000, PV = 13,323.8494

D. N=20, I=8, PMT =2000, PV = 19,636.294

59. An investment pays \$2,000 every month for 2 years. Your opportunity cost is 10% compounded annually. The present value of this investment is closest to:

- A. \$43,342
- B. \$43,529
- C. \$47,405
- D. \$48,000

Answer: B

Type: Calculation

Level of Difficulty: Difficult LO: 5.3

$$(1 + 0.12) - 1 = 0.8333\%$$

$$(1 + 0.10)^{1/12} - 1 = 0.7974\%$$

B. N=24, I=, PMT = 2000, PV = 43529.2088

C. N=24, I=.1, PMT =2000, PV = 47405.1651

D. N=24, I=0, PMT =2000, PV = 48000.00

Practice Problems:

60. Explain the difference between simple interest and compound interest.

Type: Concept

Level of Difficulty: Easy

LO: 5.3

Suggested answer:

Simple interest is interest that is paid only on the amount originally invested but not on any interest that accrues subsequently. In contrast, when interest compounds it is reinvested – you earn interest on your interest as well as your principal invested.

61. Explain what the effective (or equivalent) annual interest rate is and why we use it.

Type: Concept

Level of Difficulty: Medium LO: 5.5

Suggested answer:

The effective annual interest rate is used when comparing interest rates of different compounding periods. It is basically the nominal rate expressed as an annual rate, taking into account the effect of compounding. If you invested \$1 for one year at 10 percent compounded quarterly, at the end of the year you would have \$1.1038. Therefore, the effective annual rate is 10.38 percent

62. Explain why the interest rates publicized by credit card companies do not reflect the real cost of borrowing incurred on the charges to these cards.

Type: Concept Level of Difficulty: Medium LO: 5.5

Suggested answer:

The publicized interest rates publicized are Annual Percentage Rates. They do not show that the compounding is done on a daily basis, which underestimates the real cost of money. The actual or true cost should be calculated as the EAR.

63. You have received 2 job offers:

ABC is offering to pay you \$5,000 at the end of each month for 5 years and then \$8,000 at the end of each month for the next 5 years.

PQR is offering you \$2,500 twice a month for the first 5 years and then \$4,000 twice a month for the next 5 years.

If your decision is based solely on money, which job offer do you prefer? Why? *Note: no calculations are necessary.*

Type: Concept Level of Difficulty: Difficult LO: 5.4

Suggested answer:

All else being equal, you prefer the PQR offer. Consider month 1 where ABC pays \$5,000 at the end of the month but PQR pays \$2,500 twice a month. To compare the paycheques for this month, compare the FV of both salaries at the end of month one. $FV(ABC) = \$5,000$ while $FV(PQR) = 2,500 + 2,500 \cdot (1+i)$. As long as $i > 0$, the value of PQR at the end of each month must be greater than the value of ABC. Therefore, you would prefer PQR's offer.

64. You won the lottery and you were asked to choose between two options:

Get \$1,000 every week for ever.

Get \$1,000,000 in a lump sum.

You expect to earn an effective annual rate of 5.3 percent on your investments. Assuming there is no risk between the two, which option do you prefer?

$$\frac{1000}{[(1.053)^{1/52} - 1]} = \$1,006,408.38$$

The present value of the perpetuity is which is higher than the value of the lump sum.

65. Carmen's Grandfather died 5 years ago and left Carmen a perpetuity paying \$50,000 a year. Carmen's cost of capital is 4%. After receiving the 5th payment, Carmen received an offer of 1.4 million from The Bizet Hedge Fund for the remainder of the perpetuity. Should Carmen accept the offer?

Type: Concept Level of Difficulty: Medium LO: 5.4

Suggested answer:

The present value of the remaining cash flows is $\$50,000 / .04 = \$1.25$ million. As the offer is greater than the present value of the cash flows to Carmen, she should accept the offer.

66. You have just obtained a \$150,000 10 year 6% fixed rate mortgage. The mortgage is amortized over 25 years. The interest rate is compounded semiannually and you make monthly payments at the end of each month.

Immediately after you signed the paper work, mortgage rates dropped to 5%. Your bank has offered you the opportunity to renegotiate the mortgage for a penalty of \$10,000. Should you take this opportunity? Assume your opportunity cost equals the mortgage rate.

Type: Calculation Level of Difficulty: Difficult LO: 5.1

Suggested answer:

To solve this problem we need to compare the present value of the current monthly payments discounted at 5% with the present value of the new payments. If the difference is greater than \$10,000 then it is worth it to renegotiate.

$$1.03^{\frac{1}{6}} - 1 = 0.4939\% \quad 974\%$$

N=25*12, PV=150,000, I/Y = , solve for PMT = \$959.7099

$$1.025^{\frac{1}{6}} - 1 = 0.4124\%$$

N=25*12, PV=? I/Y = , PMT=959.7099.

The present value of the monthly payments of \$959.7099 is \$165,010.61

The present value of the new payments will be \$150,000 (by definition).

As the present value of the current payments of \$959.71 is more than \$10,000 greater than \$150,000, it is worth it for us to renegotiate the mortgage and to take advantage of the lower interest rate.

67. Rosie wants to retire in 30 years. At retirement she wants to be able to withdraw \$100,000 at the end of each year forever (she plans on establishing a scholarship fund at her local university after her death). Assuming that her investments can earn 10% compounded semi-annually prior to her retirement and only 5% compounded annually after her retirement (retired people and universities are very conservative investors), how much must Rosie invest each year for the next 30 years? Assume her first deposit will occur in one year.

Type: Calculation Level of Difficulty: Medium LO: 5.7

Suggested answer:

$$1.05^3 - 1 = 10.25\%$$

Need an annuity with 30 payments with future value of \$2 million. Interest rate = → N= 30, FV = \$2 million, I= 10.25, solve for PMT = \$11,595.56

Rosie will need to deposit \$11,595.56 every year for the next 30 years to fund her retirement and scholarship.

Spreadsheet Problem

68. On January 1, 2010 your bank approved your mortgage and you bought your first home. The mortgage value is \$ 180,000 compounded annually, at a rate of 10%. In excel, generate two mortgage amortization schedules for the 25 years mortgage: one showing the monthly payments

for the first twelve months and the other showing the annual payments from the next year until the mortgage matures.

Type: Calculation Level of Difficulty: Difficult LO: 5.6

Mortgage Amortization

Inputs		Key Figures	
Loan principal amount	\$180,000.00	Annual loan payments	\$19,627.92
Annual interest rate	10.000%	Monthly payments	\$1,635.66
Loan period in years	25	Interest in first calendar year	\$17,923.27
Base year of loan	2010	Interest over term of loan	\$310,698.00
Base month of loan	January	Sum of all payments	\$490,698.00

Payments in First 12 Months								
Year	Month	Beginning Balance	Payment	Principal	Interest	Cumulative Principal	Cumulative Interest	Ending Balance
2010	Jan	\$180,000.00	\$1,635.66	\$135.66	\$1,500.00	\$135.66	\$1,500.00	\$179,864.34
	Feb	\$179,864.34	\$1,635.66	\$136.79	\$1,498.87	\$272.45	\$2,998.87	\$179,727.55
	Mar	\$179,727.55	\$1,635.66	\$137.93	\$1,497.73	\$410.38	\$4,496.60	\$179,589.62
	Apr	\$179,589.62	\$1,635.66	\$139.08	\$1,496.58	\$549.46	\$5,993.18	\$179,450.54
	May	\$179,450.54	\$1,635.66	\$140.24	\$1,495.42	\$689.70	\$7,488.60	\$179,310.30
	Jun	\$179,310.30	\$1,635.66	\$141.41	\$1,494.25	\$831.11	\$8,982.85	\$179,168.89
	Jul	\$179,168.89	\$1,635.66	\$142.59	\$1,493.07	\$973.70	\$10,475.92	\$179,026.30
	Aug	\$179,026.30	\$1,635.66	\$143.77	\$1,491.89	\$1,117.47	\$11,967.81	\$178,882.53
	Sep	\$178,882.53	\$1,635.66	\$144.97	\$1,490.69	\$1,262.44	\$13,458.50	\$178,737.56
	Oct	\$178,737.56	\$1,635.66	\$146.18	\$1,489.48	\$1,408.62	\$14,947.98	\$178,591.38
	Nov	\$178,591.38	\$1,635.66	\$147.40	\$1,488.26	\$1,556.02	\$16,436.24	\$178,443.98
	Dec	\$178,443.98	\$1,635.66	\$148.63	\$1,487.03	\$1,704.65	\$17,923.27	\$178,295.35

Yearly Schedule of Balances and Payments							
Year	Beginning Balance	Payment	Principal	Interest	Cumulative Principal	Cumulative Interest	Ending Balance
2011	\$178,295.35	\$19,627.92	\$1,883.32	\$17,744.60	\$3,587.97	\$35,667.87	\$176,412.03
2012	\$176,412.03	\$19,627.92	\$2,080.35	\$17,547.57	\$5,668.32	\$53,215.44	\$174,331.68
2013	\$174,331.68	\$19,627.92	\$2,298.19	\$17,329.73	\$7,966.51	\$70,545.17	\$172,033.49
2014	\$172,033.49	\$19,627.92	\$2,538.84	\$17,089.08	\$10,505.36	\$87,634.24	\$169,494.64
2015	\$169,494.64	\$19,627.92	\$2,804.69	\$16,823.23	\$13,310.05	\$104,457.47	\$166,689.95
2016	\$166,689.95	\$19,627.92	\$3,098.38	\$16,529.54	\$16,408.43	\$120,987.01	\$163,591.57
2017	\$163,591.57	\$19,627.92	\$3,422.82	\$16,205.10	\$19,831.25	\$137,192.11	\$160,168.75
2018	\$160,168.75	\$19,627.92	\$3,781.24	\$15,846.68	\$23,612.49	\$153,038.79	\$156,387.51

2019	\$156,387.51	\$19,627.92	\$4,177.18	\$15,450.74	\$27,789.67	\$168,489.53	\$152,210.33
2020	\$152,210.33	\$19,627.92	\$4,614.59	\$15,013.33	\$32,404.26	\$183,502.86	\$147,595.74
2021	\$147,595.74	\$19,627.92	\$5,097.79	\$14,530.13	\$37,502.05	\$198,032.99	\$142,497.95
2022	\$142,497.95	\$19,627.92	\$5,631.60	\$13,996.32	\$43,133.65	\$212,029.31	\$136,866.35
2023	\$136,866.35	\$19,627.92	\$6,221.30	\$13,406.62	\$49,354.95	\$225,435.93	\$130,645.05
2024	\$130,645.05	\$19,627.92	\$6,872.75	\$12,755.17	\$56,227.70	\$238,191.10	\$123,772.30
2025	\$123,772.30	\$19,627.92	\$7,592.42	\$12,035.50	\$63,820.13	\$250,226.59	\$116,179.87
2026	\$116,179.87	\$19,627.92	\$8,387.45	\$11,240.47	\$72,207.57	\$261,467.07	\$107,792.43
2027	\$107,792.43	\$19,627.92	\$9,265.72	\$10,362.20	\$81,473.29	\$271,829.27	\$98,526.71
2028	\$98,526.71	\$19,627.92	\$10,235.96	\$9,391.96	\$91,709.26	\$281,221.22	\$88,290.74
2029	\$88,290.74	\$19,627.92	\$11,307.80	\$8,320.12	\$103,017.06	\$289,541.34	\$76,982.94
2030	\$76,982.94	\$19,627.92	\$12,491.88	\$7,136.04	\$115,508.94	\$296,677.38	\$64,491.06
2031	\$64,491.06	\$19,627.92	\$13,799.94	\$5,827.98	\$129,308.88	\$302,505.36	\$50,691.12
2032	\$50,691.12	\$19,627.92	\$15,244.97	\$4,382.95	\$144,553.85	\$306,888.31	\$35,446.15
2033	\$35,446.15	\$19,627.92	\$16,841.32	\$2,786.60	\$161,395.17	\$309,674.91	\$18,604.83
2034	\$18,604.83	\$19,627.92	\$18,604.83	\$1,023.09	\$180,000.00	\$310,698.00	\$0.00

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Chapter 6: Bond Valuation and Interest Rates

Multiple Choice Questions

Section 6.1 – The basic structure of bonds

1. Which of the following is generally **NOT** stated in a bond indenture?

- A. The interest payment dates.
- B. The principal repayment date.
- C. The call date.
- D. The maturity date.

Answer: C Type: Concept Difficulty: Easy LO: 6.1

2. Which of the following is **NOT** a true statement?

- A. Mortgage bonds are debt instruments that are secured by real assets.
- B. Callable bonds give the issuer the option to “call” or repurchase outstanding bonds at predetermined call prices at specified times.
- C. Retractable bonds allow the bondholder to sell the bonds back to the issuer at predetermined prices at specified times **earlier than** the maturity date.
- D. Extendible bonds allow the issuer to extend the maturity date of the bond.

Answer: D Type: Definition Difficulty: Medium LO: 6.1

3. Which of the following statements is **TRUE**?

- A. Protective covenants are clauses that restrict the actions of the bondholder.
- B. Convertible bonds are debt instruments that can be converted into common shares at predetermined conversion prices.
- C. Sinking fund provisions require the trustee to set money aside each year so that funds are available at maturity to pay off the debt.
- D. Purchase fund provisions require the repurchase of a certain amount of debt only if it can be repurchased at or above a given price.

Answer: B Type: Concept Difficulty: Medium LO: 6.1

4. Which one of the following is **NOT** a bond provision?

- A. Pledging financial assets as collateral to the bond issue.
- B. Limiting dividend payments to equity holders.
- C. Limiting payments to other existing bond holders
- D. Pledging equipment as collateral for the issue.

Answer: C Type: Concept Difficulty: Medium LO: 6.1

5. Which of the following statements is **FALSE**?

- A. The bullet (balloon) payment refers to the principal payment made in one lump sum at maturity.
- B. Collateral trust bonds are debt instruments that are secured by real assets.
- C. Protective covenants can be positive or negative.
- D. Debentures are debt instruments that are generally unsecured.

Answer: B Type: Definition Difficulty: Medium LO: 6.1

Section 6.2 – Bond Valuation

6. Which of the following is (are) needed to price a bond?

- A. The coupon rate.
- B. The face value amount.
- C. The yield to maturity.
- D. All of the above.

Answer: D Type: Concept Difficulty: Easy LO: 6.2

7. Which of the following statements is **FALSE**?

- A. When the prevailing market interest rate is lower than the coupon rate, the bond will be traded at a premium.
- B. When the prevailing market interest rate is higher than the coupon rate, the bond will be traded at a discount.
- C. The longer the time to maturity, the less sensitive the market price of the bond becomes to changes in prevailing market rates.
- D. The higher the coupon rate, the less sensitive the market price of the bond becomes to changes in prevailing market rates.

Answer: C Type: Concept Difficulty: Medium LO: 6.2

8. The convex shape of the bond price-yield curve shows:

- I) For a given change in interest rates, bond prices will increase more when rates decrease than they will decrease when rates increase.
- II) The curve is steeper for higher interest rates.
- III) The curve is always downward sloping.

- A. I, III are correct, II is incorrect.
- B. I is incorrect, II, III are correct.
- C. I, II and III are correct.
- D. I and II, III are incorrect.

Answer: A Type: Concept Difficulty: Medium LO: 6.2

9. Use the following two statements to answer this question:

- I) The prices of bonds with higher durations are more sensitive to interest rate changes than are those with lower durations.
- II) All else being equal, durations will be higher when (1) market yields are lower, (2) bonds have longer maturities, and (3) bonds have lower coupons.
- III) Duration is a measure of risk of the bond

- A. I is correct, II, III are incorrect.
- B. I is incorrect, II, III is correct.
- C. I, II and III are correct.
- D. I, II and III are incorrect.

Answer: C Type: Concept Difficulty: Difficult LO: 6.2

10. Which of the following statements is TRUE?

- A. The quoted price of a bond is the actual price an investor pays for the bond whenever the bond is sold at a date other than the date of a coupon payment.

B. The quoted price of a bond is the actual price an investor pays for the bond when the bond is sold on the date of a coupon payment.

C. A bond purchaser must pay the bond seller the cash price plus the accrued interest on the bond.

D. The cash price plus the accrued interest on the bond is the quoted price of the bond.

Answer: B Type: Concept Difficulty: Medium LO: 6.2

11. Which one of the following increases the sensitivity of the bond prices?

A. Decrease in coupon payment

B. Decrease in maturity

C. Decrease in yield to maturity

D. Increase coupon payment

Answer: A Type: Concept Difficulty: Medium LO: 6.2

12. The price of a ten-year semi-annual pay bond with a par value of \$1,000 and a 7.5 percent annual coupon and yield to maturity of 8.25 percent is closest to:

A. \$949.60.

B. \$950.24.

C. \$1,051.48.

D. \$1,052.11.

Answer: A Type: Calculation Difficulty: Easy LO: 6.2

Explanation:

A. $N=20$, $I/Y=8.25/2$, $PMT = \$75/2$

B. $N=10$, $I/Y = 8.25$, $PMT = \$75$

C. $N=10$, $I/Y=7.5$, $PMT = \$82.50$

D. $N=20$, $I/Y=7.5/2$, $PMT=82.50/2$

13. An investor bought a bond at par and held it for one year. If the coupon rate is 5 percent, residual maturity of the bond is 8 years, and the yield to maturity of the bond when it was sold was 6 percent. What is the holding period return of the bond?

5%

6%

-1.21%

-1.23%

Answer: C Type: Calculation Difficulty: Difficult LO: 6.2

Explanation:

A. Coupon rate

B. Yield to maturity

$$R = \frac{937.90 + 50 - 1000}{1000} = -1.21\%$$

D. Change the value in the denominator to the selling price

14. Toronto Skates Corp. has 6 percent annual-pay coupon bonds that trade with a yield to maturity of 5.5 percent. The bonds have eight years to maturity. What is the current bond price closest to?

- A. \$1,032.01
- B. \$1,031.67
- C. \$968.95
- D. \$968.60

Answer: B Type: Calculation Difficulty: Easy LO: 6.2

Explanation:

- A. $N=16, I/Y=5.5/2, PMT=\$60/2$
- B. $N=8, I/Y=5.5, PMT=\$60$
- C. $N=8, I/Y=6, PMT=\$55$
- D. $N=16, I/Y=6/2, PMT=\$55/2$

15. Two years ago, St Laurent Shippers Co. issued seven year semi-annual pay bonds with a coupon rate of 8 percent. At issue, the yield to maturity was 7.5%. Today the market rate on the bonds is 9 percent. The current price of the bond is closest to:

- A. \$1,026.85
- B. \$1,020.53
- C. \$960.44
- D. \$948.89

Answer: D Type: Calculation Difficulty: Easy LO: 6.2

Explanation:

- A. $N=14, I/Y = 7.5/2, PMT = \$80/2$
- B. $N=10, I/Y = 7.5/2, PMT=\$40$
- C. $N=10, I/Y = 9/2, PMT = \$40$
- D. $N=14, I/Y= 9/2, PMT = \$40$

16. A five-year annual pay bond is quoted at 93.011 with a market yield of 8 percent. The coupon rate is closest to?

- A. 4.12%
- B. 6.25%
- C. 6.28%
- D. 9.19%

Answer: B Type: Calculation Difficulty: Medium LO: 6.2
(requires a financial calculator)

Explanation:

- A. $N=5, I/Y = 9.3011, FV = 1000, PV=800$, solve for PMT
- B. $N=5, I/Y = 8, FV=1000, PV=930.11$, solve for PMT.
- C. $N=10, I/Y=4, FV=1000, PV=930.11$, solve for PMT. (coupon rate = $2 \times \text{pmt}/1000$)
- D. $N=5, I/Y=8, FV=930.11, PV=1000$, solve for PMT

17. LaMaudite Lager Inc. has semi-annual pay bonds that trade with a yield to maturity of 7 percent. The bonds have a six-year term to maturity and are currently selling for \$1,067.20. The coupon rate of the bond is closest to:

- A. 4.95%

- B. 8.39%
- C. 8.41%
- D. 15.69%

Answer: B Type: Calculation Difficulty: Medium LO: 6.2

Explanation:

- A. $N=6$, $I/Y = 7/2\%$, $FV = \$1,067.20$, $PV=1,000$, solve for PMT, $c=2*\text{pmt}/FV$
- B. $N=12$, $I/Y = 7/2\%$, $FV = \$1,000$, $PV=1,067.20$ solve for PMT, $c=2*\text{pmt}/FV$
- C. $N=6$, $I/Y = 7\%$, $FV = \$1,000$, $PV=1,067.20$ solve for PMT, $c=\text{pmt}/FV$
- D. $N=12$, $I/Y = 7\%$, $FV = \$1,000$, $PV=1,067.20$ solve for PMT, $c=2*\text{pmt}/FV$

18. A ten-year annual pay bond with a 5% coupon rate is trading with a market yield of 7.75 percent. What is the percentage change in price if the market yield decreases by 75 basis points?

- A. 5.37%
- B. 5.61%
- C. 5.67%
- D. 5.77%

Answer: C Type: Calculation Difficulty: Medium LO: 6.2

Explanation:

- A. Price difference / Price after yield change
- B. Transpose coupon rate with YTM
- C. Price before yield change: \$813.374. Price after yield change \$859.528. Percentage change in price = $(859.528-813.374)/813.374 = 5.674\%$
- D. Computation was done with $YTM/2$ instead of YTM

19. A five-year bond paying 8 percent semi-annual-pay coupon is trading on the market at a yield of 6.75 percent. What is the percentage change in price if the market yield increases by 75 basis points?

- A. -2.98%
- B. -3.02%
- C. -3.05%
- D. -3.11%

Answer: B Type: Calculation Difficulty: Medium LO: 6.2

Explanation:

- A. Computation was done with YTM instead of $YTM/2$
- B. Price before yield change: \$1,052.308. Price after yield change: \$1,020.532. Percentage change in price = $(1020.532 - 1052.308)/1052.308 = -3.02\%$
- C. Transpose coupon rate with market yield
- D. Price difference / Price after yield change

20. It is now October 25, 2006, Jenny has just purchased a ten-year 4.5 percent Canadian government bond quoted at 96.894. The last semi-annual coupon payment was made on June 30, 2006. How much will Jenny actually pay for this bond?

- A. \$954.52
- B. \$968.94
- C. \$976.15
- D. \$983.36

Answer: D Type: Calculation Difficulty: Medium LO: 6.2

Explanation:

- A. Quoted price – accrued interest
- B. Quoted price
- C. Quoted price + accrued interest based on semi-annual coupon rate
- D. Cash price = $\$968.94 + (1000 \times 4.5\% \times 117/365) = \$983.36$.

Section 6.3 – Bond Yields

21. The yield to maturity (YTM) is:

- A. the discount rate used to evaluate bonds.
- B. the bond's internal rate of return.
- C. the yield that an investor would realize if he or she bought the bond at the current price, held it to maturity, received all the promised payments on their scheduled dates, and reinvested all the cash flows received at YTM.
- D. All of the above.

Answer: D Type: Concept Difficulty: Medium LO: 6.3

22. The current yield (CY) is:

- A. The ratio of the semi-annual coupon interest divided by the bond's maturity value.
- B. The ratio of the semi-annual coupon interest divided by the bond's current market price.
- C. The ratio of the annual coupon interest divided by the bond's current market price.
- D. The ratio of the annual coupon interest divided by the bond's maturity value.

Answer: C Type: Definition Difficulty: Easy LO: 6.3

23. What is the current yield of a four-year semi-annual pay bond with a par value of \$1,000 and a 4 percent coupon rate when the bond is priced at \$932.35?

- A. 4.29%
- B. 4.00%
- C. 5.95%
- D. 2.14%

Answer: A Type: Definition Difficulty: Easy LO: 6.3

24. What is the YTM of a four-year annual pay bond with a par value of \$1,000 and a 4 percent coupon rate when the bond is priced at \$932.35?

- A. 2.96%
- B. 5.92%
- C. 5.95%
- D. 11.90%

Answer: C Type: Calculation Difficulty: Medium LO: 6.3

Explanation:

- A. $N=8$, $PMT = \$20$, $FV = 1000$, $PV = 932.35$, solve for I/Y
- B. $N=8$, $PMT = \$20$, $FV = 1000$, $PV = 932.35$, $YTM = 2 \times I/Y$
- C. $N=4$, $PMT = \$40$, $FV = 1000$, $PV = 932.35$, solve for I/Y
- D. $N=4$, $PMT = \$40$, $FV = 1000$, $PV = 932.35$, $YTM = 2 \times I/Y$

25. What is the YTM of a four-year semi-annual pay bond with a par value of \$1,000 and a 4 percent coupon rate when the bond is priced at \$932.35?

- A. 2.96%
- B. 5.92%
- C. 5.95%
- D. 11.90%

Answer: B Type: Calculation Difficulty: Medium LO: 6.3

Explanation:

- A. $N=8$, $PMT = \$20$, $FV = 1000$, $PV = 932.35$
- B. $N=8$, $PMT = \$20$, $FV = 1000$, $PV = 932.35$, $YTM = 2 \times I/Y$
- C. $N=4$, $PMT = \$40$, $FV = 1000$, $PV = 932.35$, solve for I/Y
- D. $N=4$, $PMT = \$40$, $FV = 1000$, $PV = 932.35$, $YTM = 2 \times I/Y$

26. A fifteen-year 7 percent semi-annual-pay coupon bond that is callable in five years at a call price of \$1,070 is selling for \$1,036.53. What is the YTC of this bond?

- A. 7.30%
- B. 6.61%
- C. 6.14%
- D. 6.00%

Answer: A Type: Calculation Difficulty: Medium LO: 6.3

Explanation:

- A. $PV=1036.53$; $N=10$, $PMT=\$35$, $FV=\$1,070$, $YTC = 2 \times I/Y$
- B. YTM of the bond
- C. Call price replaced by face value in the computation of A)
- D. Transpose bond price with call price

27. The market yield of a twelve-year 8 percent semi-annual-pay bond is 6.6 percent. The bond is callable in four years and its yield to call is 6.48 percent. What is the call price of the bond?

- A. \$1,125.46
- B. \$1,114.81
- C. \$1,085.94
- D. \$1,080.00

Answer: D Type: Calculation Difficulty: Difficult LO: 6.3

Explanation:

- A. Bond price was computed with YTC instead of YTM
- B. Straight bond price
- C. YTC replaced by YTM in the computation of D)
- D. Compute bond price: $N=24$, $I/Y = 6.6/2$, $PMT = \$40$, $FV = 1000$. Bond price = \$1,114.81. Compute Call Price (CP): $N= 8$, $I/Y = 6.48/2$, $PMT= 40$, $FV=CP$, $PV=\$1,114.81$ solve for CP. $CP=\$1,080$.

28. The market yield of a twelve-year 7 percent annual-pay bond is 6 percent. The bond is callable in three years and its yield to call is 5.7 percent. What is the call price of the bond?

- A. 1057.74
- B. 1083.84
- C. 1089.59

D. 1026.73

Answer: A Type: Calculation Difficulty: Difficult LO: 6.3

Explanation:

A. Bond price: $N=12$; $I/Y=6.0\%$; $PMT=70$; $FV=1000$ solve $PV=1083.84$. Compute the call price: $N=3$; $I/Y=5.7$, $PMT=100$; $PV=1083.84$; CPT $FV=1057.74$.

B. Bond price: $N=12$; $I/Y=6.0\%$; $PMT=70$; $FV=1000$ solve $PV=1083.84$.

C. Bond price: $N=12$; $I/Y=5.7\%$; $PMT=70$; $FV=1000$ solve $PV=1010.81$. Compute the call price: $N=3$; $I/Y=5.7$, $PMT=100$; $PV=1083.84$; CPT $FV=1089.59$.

D. Call price: $N=3$; $I/Y=6.0\%$; $PMT=70$; $FV=1000$ solve $PV=1026.73$

29. A four-year 6 percent semi-annual-pay bond with a maturity value of \$1,000 is trading at the YTM of 7 percent. What is this bond's current yield?

A 5.80%

B. 6.21%

C. 6.76%

D. 7.25%

Answer: B Type: Calculation Difficulty: Medium LO: 6.3

Explanation:

A. Transpose coupon rate with YTM in the computation of bond price

B. Compute bond price: $N=8$, $I/Y = 7/2$, $PMT = \$60/2$, bond price = \$965.63. Current yield = $\$60/965.63 = 6.21\%$.

C. Transpose coupon rate with YTM in the computations of bond price and current yield

D. YTM / B

Section 6.4 – Interest Rate Determinants

30. The nominal interest rate is:

A. the risk-free rate.

B. the difference between the real rate and expected inflation.

C. low when expected inflation is low and high when expected inflation is high.

D. All of the above

Answer: C Type: Concept Difficulty: Medium LO: 6.4

31. _____ refers to the relationship between interest rates and the term to maturity on underlying debt instruments.

A. The Expectations theory

B. The Liquidity preference theory

C. The Market segmentation theory

D. The Term structure of interest rates

Answer: D Type: Definition Difficulty: Easy LO: 6.4

32. Which one of the following statements refers to the market segmentation theory?

A. Long-term interest rates are a function of short term ones.

B. Long-term investors ask for a compensation for the illiquidity of long term bonds.

C. Pension fund managers don't invest in money market instruments.

D. Long-term and short-term portions of the yield curve are always correlated.

Answer: C Type: Concept Difficulty: Medium LO: 6.4

33. Which of the following is **NOT** a correct statement of the interest rate parity (IRP) theory?
- A. It states the relationship between inflation and interest rates.
 - B. It states that forward currency contracts can be used to eliminate foreign exchange risk.
 - C. It demonstrates how differences in interest rates across countries are offset by expected changes in exchange rates.
 - D. It describes the relationship between interest rates and currency levels by using forward currency exchange rates.

Answer: A Type: Definition Difficulty: Medium LO: 6.4

34. Which one of the following will occur during an increase in the supply of loanable funds?
- A. A decrease in interest rates.
 - B. A decrease of the money supply in the economy.
 - C. A decrease in insured deposit amounts.
 - D. A decrease in the saving rate in the economy.

Answer: A Type: Definition Difficulty: Easy LO: 6.4

35. Which of the following is **NOT** a theory of the term structure of interest rates?
- A. Expectations theory
 - B. Interest rate parity theory
 - C. Liquidity preference theory
 - D. Market segmentations theory

Answer: B Type: Concept Difficulty: Medium LO: 6.4

36. Which of the following risks may be included in the spread that compensates corporate bond investors for the assumption of additional risks over domestic government bond investors?
- A. Default risk
 - B. Foreign exchange rate risk
 - C. Interest rate risk
 - D. All of these

Answer: A Type: Concept Difficulty: Medium LO: 6.4

37. Which one of the following ratios is the most correlated to default risk?
- A. Account receivables collection period
 - B. Inventory collection period
 - C. Debt to equity ratio
 - D. Profit margin

Answer: C Type: Concept Difficulty: Medium LO: 6.4

38. Debt ratings assigned by professional debt-rating services are a measure of the bond issuers'
- A. currency risk.
 - B. interest rate risk.
 - C. foreign exchange rate risk.
 - D. default risk.

Answer: D Type: Concept Difficulty: Medium LO: 6.4

39. Which one of the following is NOT true?

- A. A bond issuer's rating affects the yield asked by investors.
- B. An investor holding the bond until maturity expects to receive its par value.
- C. Inflation does not affect the interest rates of bonds.
- D. Rating agencies use financial statements to assess the default probability of firms.

Answer: C Type: Concept Difficulty: Medium LO: 6.4

40. Marie bought a five-year 4.25 percent annual coupon bond for \$974 a year ago. Today, he sold the bond at the market yield of 4 percent. What is Marie's approximate real rate of return if the inflation rate over the past year was 2.2 percent?

- A. 1.80%
- B. 2.05%
- C. 5.76%
- D. 5.98%

Answer: C Type: Calculation Difficulty: Medium LO: 6.4

Explanation:

- A. YTM – inflation
- B. Coupon rate – inflation
- C. Compute bond price: $N=4$, $I/Y=4$, $PMT=\$42.5$, $FV=\$1,000 \rightarrow PV = \$1,009.07$. Nominal return = $(42.5 + 1009.07 - 974)/974 = 7.96\%$. Approximate real rate = $7.96\% - 2.2\% = 5.76\%$.
- D. Compute bond price: $N=5$, $I/Y=4$, $PMT=\$42.5$, $FV = \$1,000 \rightarrow PV = \$1,011.13$. Nominal return = $(42.5 + 1011.13 - 974)/974 = 8.1755\%$. Approximate real rate = $8.1755\% - 2.2\% = 5.9755\%$.

41. The risk premium of a company would increase with:

- A. An increase in the debt to equity ratio
- B. An increase in the current ratio
- C. A stable interest coverage ratio.
- D. An increase in earnings

Answer: A Type: Concept Difficulty: Difficult LO: 6.4

42. Suppose you observed that one-year T-bills are trading at a YTM of 4.35 percent. The yield spread between AAA- and BBB-rated corporate bonds is 150 basis points. The maturity yield differential between the one-year T-bills and the five-year government bonds is 65 basis points. What yield would you expect to observe on BBB-rated corporate bonds with a five-year maturity?

- A. 5.00%
- B. 5.20%
- C. 5.85%
- D. 6.50%

Answer: D Type: Calculation Difficulty: Medium LO: 6.4

Explanation:

- A. RF + maturity yield differential
- B. RF – maturity yield differential + yield spread
- C. RF + yield spread
- D. $k_b = RF \pm \text{maturity yield differential} + \text{yield spread} = 6.50\% = 4.35\% + 0.65\% + 1.50\%$

43. Which one of the following statements is NOT correct?

- A. AAA bonds are the safest bond investment.
- B. Speculative grade bonds require high yields.
- C. Large, well established companies always have speculative grade.
- D. Speculative bonds are also called Junk bonds.

Answer: C Type: Concept Difficulty: Medium LO: 6.4

44. Suppose you observed that five-year government bonds are trading at a YTM of 5.75 percent. The yield spread between AAA- and BBB-rated corporate bonds is 130 basis points. The maturity yield differential between the three-year and five-year government bonds is 45 basis points. What yield would you expect to observe on BBB-rated corporate bonds with three years to mature?

- A. 5.30%
- B. 6.60%
- C. 7.05%
- D. 7.50%

Answer: B Type: Calculation Difficulty: Medium LO: 6.4

Explanation:

- A. RF – maturity yield differential
- B. $k_b = \text{RF} \pm \text{maturity yield differential} + \text{yield spread} = 6.60\% = 5.75\% - 0.45\% + 1.30\%$
- C. RF + yield spread
- D. RF + maturity yield differential + yield spread

Section 6.5 – Other Types of Bonds/Debt Instruments

45. What is the price of a 183-day Canadian T-bill with a par value of \$5,000 that has a quoted yield of 5 percent?

- A. \$4,761.91
- B. \$4,876.07
- C. \$4,877.72
- D. \$4,879.17

Answer: C Type: Calculation Difficulty: Easy LO: 6.5

$$P = \frac{F}{(1 + k_{\text{EFF}})}$$

$$P = \frac{F}{(1 + k_{\text{EFF}} \times \frac{n}{360})}$$

$$P = \$4,877.72 = \frac{\$5,000}{(1 + 5\% \times \frac{183}{365})}$$

$$P = \frac{F}{(1 + k_{\text{EFF}})^{183/365}}$$

D.

46. What is the yield of a 91-day Canadian T-bill with a par value of \$1,000 that is quoted at 98.735?

- A. 5.07%
- B. 5.14%
- C. 5.22%
- D. 5.24%

Answer: B Type: Calculation Difficulty: Easy LO: 6.5

$$k_{BFY} = \frac{F - P}{P} \times \frac{360}{n}$$

$$k_{BFY} = 5.14\% = \frac{\$1,000 - \$987.35}{\$987.35} \times \frac{365}{91}$$

$$k_{BFY} = \left(\frac{F}{P} \right)^4 - 1$$

$$k_{BFY} = \left(\frac{F}{P} \right)^{365/91} - 1$$

D.

47. A 182-day Canadian T-bill has a bond equivalent yield of 3.925 percent. What is the bank discount yield on a 182-day U.S. T-bill with the same quoted price?

- A. 3.90%
- B. 3.87%
- C. 3.83%
- D. 3.80%

Answer: D Type: Calculation Difficulty: Difficult LO: 6.5

Explanation:

$$k_{BDY} = k_{BFY} \times \frac{360}{365}$$

$$k_{BDY} = \frac{360 \times k_{BFY}}{365 \times (1 + k_{BFY} \times \frac{n}{365})} = \frac{360 \times 3.925\%}{365 \times (1 + 3.925\% \times \frac{182}{365})} = 3.80\%$$

D.

48. A 180-day U.S. T-bill has a bond discount yield of 4.135 percent. What is the bank equivalent yield on a 180-day Canadian T-bill with the same quoted price?

- A. 4.28%
- B. 4.24%
- C. 4.19%
- D. 4.16%

Answer: A Type: Calculation Difficulty: Easy LO: 6.5

$$k_{BFY} = \frac{365 \times k_{BDY}}{360 - n \times k_{BDY}} = \frac{365 \times 4.135\%}{360 - 180 \times 4.135\%} = 4.28\%$$

A.

$$k_{BFY} = k_{BDY} \times \frac{365}{360}$$

C.

D. Transpose 360 with 365

49. A twenty-year zero coupon bond with a face value of \$1,000 is currently selling for \$326.50. What is the bond's YTM?

A. 5.65%

B. 5.68%

C. 5.72%

D. 5.76%

Answer: B Type: Calculation Difficulty: Easy LO: 6.5

Explanation:

$$YTM = 2 \times \left[\left(\frac{F}{B} \right)^{\frac{1}{2n}} - 1 \right] = 2 \times \left[\left(\frac{\$1,000}{\$326.5} \right)^{\frac{1}{40}} - 1 \right] = 5.68\%$$

B.

$$YTM = \left(\frac{F}{B} \right)^{1/n} - 1$$

D.

50. A zero coupon bond with a face value of \$1,000 is currently selling for \$687.38. The bond has a market yield of 5.48 percent. What is the bond's term to maturity?

A. 6.62 years

B. 6.93 years

C. 7.03 years

D. 7.42 years

Answer: B Type: Calculation Difficulty: Easy LO: 6.5

$$n = 0.5 \times \left(\frac{\ln(F/B)}{\ln(1 + YTM/2)} \right) = 0.5 \times \left(\frac{\ln(\$1,000/\$687.38)}{\ln(1 + 5.48\%/2)} \right) = 6.93 \text{ years}$$

B.

C. YTM was used in the computation instead of YTM/2

51. A ten-year zero coupon bond with a face value of \$1,000 is currently quoted at 48.72. Assume the bond's YTM remains unchanged throughout the bond's term to maturity. What should the bond be sold for three years from now?

A. \$542.69

- B. \$594.19
C. \$604.50
D. \$641.04

Answer: C Type: Calculation Difficulty: Difficult LO: 6.5

$$B_3 = B_0 \times (1 + YTM)^3$$

A. .

$$YTM_s = \left(\frac{F}{B} \right)^{\frac{1}{2n}} - 1 = \left(\frac{\$1,000}{\$487.2} \right)^{\frac{1}{20}} - 1 = 3.66\%$$

$$B_3 = B_0 \times (1 + YTM_s)^{2n} = \$487.2 \times (1.0366)^6 = \$604.50$$

Compute

$$D. 487.20 + ((1000 - 487.20) / 10) \times 3 = 641.04$$

Section – Appendix 6A – Interest rate parities

52. Suppose Canadian interest rates are presently 4.5 percent on one-year Canadian T-bills. Suppose that the U.S. dollar is quoted at US\$1 = C\$1.0695 and that the interest rate on one-year T-bills in the U.S. is 4.9 percent. What should the one-year forward exchange rate (C\$/US\$) be?

- A. 1.0783
B. 1.0736
C. 1.0692
D. 1.0654

Answer: D Type: Calculation Difficulty: Easy LO: 6.6A

Explanation:

$$F = S \times \frac{(1 + k_{\text{domestic}})}{(1 + k_{\text{foreign}})} = 1.0695 \times \frac{1.045}{1.049} = 1.0654$$

D.

53. Suppose U.S. interest rates are presently 4.54 percent on one-year U.S. T-bills. Suppose that the one-year forward exchange rate is quoted at US\$1 = C\$1.0698 and that the interest rate on one-year T-bills in Canada is 4.325 percent. What should the spot exchange rate be?

- A. 1.0622
B. 1.0676
C. 1.0720
D. 1.0764

Answer: C Type: Calculation Difficulty: Medium LO: 6.6A

Explanation:

$$S = F \times \frac{(1 + k_{\text{foreign}})}{(1 + k_{\text{domestic}})} = 1.0698 \times \frac{1.0454}{1.04325} = 1.0720$$

C.

54. If everything else held constant, an increase in relative expected inflation between Canada and the US would imply:

- A. An increase in the Canadian dollar versus US dollar
- B. An decrease in the Canadian dollar versus US dollar
- C. No change in the Canadian dollar versus US dollar
- D. An decrease in the Canadian dollar versus Euro

Answer: A Type: Concept Difficulty: Difficult LO: 6.6A

Practice Problems:

55. Explain the difference between the coupon rate, the yield to maturity and the current yield.

Type: Definition Difficulty: Easy LO: 6.3

Suggested answer:

The coupon rate is the stated interest rate, on an annual basis, on the original debt contract in relation to the face value of the debt, and this determines the amount of the periodic interest payment.

The yield to maturity is the discount rate used to evaluate bonds. It is the yield that an investor would realize if he or she bought the bond at the current price, held it to maturity, received all the promised payments on their scheduled dates, and reinvested all the cash flows received at the yield to maturity.

The current yield is defined as the ratio of the annual coupon interest divided by the current market price.

56. Explain the difference between nominal and real interest rates.

Type: Definition Difficulty: Easy LO: 6.4

Suggested answer:

Nominal interest rates are the rates charged for lending today's dollars in return for getting dollars back in the future, without taking into account the purchasing power of those future dollars.

Real interest rates are measured as the difference between the ongoing expected inflation rate and the level of nominal interest rates.

57. What is the major concern about the liquidity preference theory of the yield curve?

Type: Concept Difficulty: Medium LO: 6.3

Suggested answer:

The liquidity preference theory proposes that investors ask for a premium to hold long term bonds given their illiquidity. This illiquidity premium increases with the maturity implying that the yield curve should be upward sloping. However, historically yield curves can be downward sloping as well.

58. Explain the implication of an increase in expected inflation.

Type: Concept Difficulty: Medium LO: 6.4

Suggested answer:

Nominal interest rates include expected inflation. Investors estimate purchasing power of their proceeds in the future. An increase in the expected inflation implies an increase in interest rates.

59. Discuss the reasoning behind the interest rate parity. Why don't firms always issue bonds in the country where interest rates are the lowest?

Type: Concept Difficulty: Medium LO: 6.4

Suggested answer:

Interest rate parity is the relationship between interest rates and exchange rates. A change in interest rates affects the exchange rates in the future. The Interest rate parity condition states that The interest rate differential between two countries is compensated by changes in exchange rates. So issuing bonds in a country with low interest rates will be compensated with an increase in the exchange rates to reflect the interest rate differential.

60. What is the term structure of interest rates and the yield curve?

Type: Definition Difficulty: Easy LO: 6.4

Suggested answer:

The term structure of interest rates refers to the relationship between interest rates and the term to maturity on underlying debt instruments. Other factors are held constant, particularly the risk of default. The term structure can be plotted to form a yield curve.

The yield curve is a graphical representation of the term structure of interest rates, based on debt instruments that are from the same issuer. The horizontal axis represents time to maturity and the vertical axis represents yield to maturity.

61. Briefly describe three theories of the term structure of interest rates.

Type: Concept Difficulty: Easy LO: 6.3

Suggested answer:

1. The Liquidity preference theory suggests that investors prefer short-term debt instruments because they exhibit less interest rate risk, while debt issuers prefer to lock in borrowing rates for longer periods to avoid the risk of having to refinance at higher rates. Therefore issuers must provide investors with higher yields to induce them to invest in longer-term bonds. As a result, yield curves will generally be upward sloping because long-term rates will be higher than short-term rates.

2. The Expectations theory argues that the yield curve reflects investor expectations about future interest rates. Therefore, an upward-sloping yield curve reflects expectations of interest rate increases in the future, and a downward sloping curve reflects expectations of interest rate decreases in the future.

3. The Market segmentation theory suggests that distinct markets exist for interest rate securities of various maturities and those interest rates are determined within these independent market segments by the forces of supply and demand within that market. The resulting term structure merely depicts the consequences of the forces of supply and demand within these markets.

62. J&B Co. has 8.75 percent coupon bonds quoted with a market yield of 9.25 percent. The bonds have fifteen years to mature and make annual interest payments. What is the percentage change in price for a 10 percent decrease in market yield?

Type: Calculation Difficulty: Difficult LO: 6.3

Suggested answer:

Market yield before yield change = 9.25%

Price before change in yield:

$N=15$, $PMT = 87.50$, $FV = 1000$, $I/Y = 9.25 \rightarrow PV = \$960.29$

Annualized yield after yield change = $.9 \times 9.25 = 8.33\%$

Price after change in yield = \$1,035.24

% change in price = $(1035.24 - 960.29)/960.29 = 8.0\%$ increase

63. The market yield on a fifteen-year 7.5 percent bond is 6.5%. The bond makes semi-annual coupon payments and is callable in five years at a call price of \$1,075.

A. What is the bond price based on the market yield?

B. What is the bond's yield to call?

C. Is this bond likely to be called? Explain.

Type: Calculation Difficulty: Difficult LO: 6. 3

Suggested answer:

$$B = \$37.5 * PVAF(3.25\%, 30) + \$1,000 * PVIF(3.25\%, 30) = \$1,094.91$$

$$\$1,094.91 = \$37.5 * PVAF(YTCs, 10) + \$1,075 * PVIF(YTCs, 10)$$

$$YTCs = 3.27\%$$

$$YTC = 6.54\%$$

C. Since the call price is lower than the straight bond price, it is likely that the issuer would call the bond back.

64. Genie would like to receive an exact real rate of return of 5 percent per year on a bond investment at a time when the expected inflation rate is 4.5 percent.

A. What nominal rate of return would Genie expect to receive on a bond investment?

B. How much would he be willing to pay for a bond maturing in five years if it pays a semi-annual coupon of 8 percent?

Type: Calculation Difficulty: Medium LO: 6. 3

$$RF = (1 + 5\%) * (1 + 4.5\%) - 1 = 9.725\%$$

$$B = \$40 * PVAF(4.8625\%, 10) + \$1,000 * PVIF(4.8625\%, 10) = \$932.95$$

B. Bond price,

65. Suppose you observed that one-year T-bills are trading with a YTM of 4.75 percent. The yield spread between AAA- and BB-rated corporate bonds is 130 basis points. The maturity yield differential between the one-year T-bills and three-year government bonds is 45 basis points.

A. What is the market yield would you expect on a three-year BB-rated corporate bond that pays 7.25 annual coupon?

B. How much would you pay for this three-year BB-rated corporate bond if its coupon rate was 7.25%?

Type: Calculation Difficulty: Medium LO: 6.3

Suggested answer:

A. $k_b = 1\text{-yr T-bill rate} + \text{maturity yield differential} + \text{spread}$

$$B = \$72.5 * PIAF(6.5\%, 3) + \$1,000 * PVIF(6.5\%, 3) = \$1,019.86$$

B.

66. The Supreme Investment Co. has observed that the market prices for the one-year and two-year zero coupon bonds that have no default risk are \$965.90 and \$901.54, respectively.

A. How much would Supreme pay for a two-year 5.8 percent annual coupon bond that has the same default risk as the zeros?

B. What is the yield to maturity of this two-year coupon bond?

Type: Calculation Difficulty: Difficult LO: 6.4

$$k_1 = \left[\left(\frac{\$1,000}{\$965.9} \right)^{\frac{1}{2}} - 1 \right] \times 2 = 3.5\%$$

$$k_2 = \left[\left(\frac{\$1,000}{\$901.54} \right)^{\frac{1}{4}} - 1 \right] \times 2 = 5.25\%$$

$$B = \frac{I_1}{(1+k_1)} + \frac{I_2 + F}{(1+k_2)^2} = \frac{\$58}{1.035} + \frac{\$58 + \$1,000}{1.0525^2} = \$1,011.12$$

The coupon bond price,

B. From the bond price equation, the yield to maturity of this two-year coupon bond can be

$$\$1,011.12 = \$58 * PIAF(YTM, 2) + \$1,000 * PVIF(YTM, 2)$$

YTM = 5.20%

67. Sam has put aside C\$5,000 for his travel to Japan in a year from now. He could invest the money in Canada and earn a 4.5 percent, and then convert it to Japanese Yens when he leaves. Alternatively, Sam could convert the funds to Japanese Yens (JY) and earn a 4.85 percent on a Japanese investment today. Which approach should he take if the currency spot rate is C\$/JY=0.008872 and the one-year forward rate is 0.008738?

Type: Calculation Difficulty: Medium LO: 6.3

Suggested answer:

$$\text{Funds in JY after 1 year} = \frac{5,000}{0.008872} \times 1.0485 = \text{JY}590,903.97$$

Approach 2: Invest C\$5,000 in Canada at 4.5% for one year and then convert the funds into JY

$$\text{Funds in JY after one year} = \frac{5,000 \times 1.045}{0.008738} = \text{JY } 597,962.92$$

Sam should take Approach 2. Doing so, he would have JY 7,059 more.

Unauthorized

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Chapter 7: Equity Valuation

Multiple Choice Questions

Section 7.1 – Equity securities

1. Which of the following is NOT a correct statement of equity securities?

- A. No fixed maturity date.
- B. Dividends are a tax-deductible expense for the issuer.
- C. Shareholders pay lower taxes on dividends than they would on interest payments.
- D. Ownership interests in an underlying entity.

Answer: B Type: Concept Level of Difficulty: Easy LO: 7.1

2. Which of the following is NOT a true statement?

- A. Common shareholders are the true owners of the corporation.
- B. Common shareholders are the residual claimants of the corporation.
- C. Common shareholders are entitled to the remaining assets before all other claims have been satisfied in the case of liquidation of the corporation.
- D. Common shareholders have the right to vote on major issues, such as takeovers, corporate restructuring, and so on.

Answer: C Type: Concept Level of Difficulty: Medium LO: 7.1

3. In case of bankruptcy and liquidation of assets, what is the order of the claimants?

- A. Equity holders, debt holders, preferred shares holders
- B. Debt holders, preferred shares holders, equity holders
- C. Debt holders, equity holders, preferred shares holders
- D. Debt holders, equity and preferred shares holders equally.

Answer: B Type: Concept Level of Difficulty: Easy LO: 7.1

4. Which of the following is a FALSE statement of preferred shares?

- A. Always have voting rights.
- B. Dividends must be paid in entirety before the common shareholders can receive any payments.
- C. Have preference over common shares with respect to income and assets.
- D. Provide the owner with a claim to a fixed amount of equity.

Answer: A Type: Concept Level of Difficulty: Medium LO: 7.1

5. What are the sources of uncertainties in the valuation of common equities?

- A. Discount rate only
- B. Cash flow size and timing only
- C. Cash flow size, timing, and discount rate
- D. Cash flow size, timing, and risk free rate

Answer: C Type: Concept Level of Difficulty: Medium LO: 7.1

6. Use the following two statements to answer this question:

- I) Dividends are not a legal obligation of the firm until the board of directors declares them.
- II) Interest payments are a legal obligation of the firm only after the board of directors declares them.

- A. I and II are correct.
- B. I and II are incorrect.
- C. I is correct, II is incorrect.
- D. I is incorrect, II is correct.

Answer: C Type: Concept Level of Difficulty: Easy LO: 7.1

7. Which of the following is/are needed when the discounted cash flow approach is used to value equity securities?

- A. Estimate the expected future cash flows associated with the security.
- B. Determine the appropriate discount rate based on an estimate of the risk associated with the security.
- C. Estimate the size and timing of the expected cash flows associated with the security.
- D. All of these.

Answer: D Type: Concept Level of Difficulty: Medium LO: 7.1

Section 7.2 – Preferred Share Valuation

8. Traditional preferred shares

- A. are often referred to as fixed income investments.
- B. have maturity date.
- C. pay dividends at irregular intervals.
- D. pay dividends of various amounts.

Answer: A Type: Definition Level of Difficulty: Medium LO: 7.2

9. If the required rate of return is higher than the dividend rate of a preferred share, the par value is _____ the current market value of the preferred share.

- A. Equal to
- B. Higher than
- C. Less than
- D. Independent than

Answer: B Type: Concept Level of Difficulty: Medium LO: 7.2

10. A bond and a preferred share _____

- A. both have a fixed payment.
- B. both have the same risk profile.
- C. always have a maturity date.
- D. are claims on the debt of the firm.

Answer: A Type: Concept Level of Difficulty: Easy LO: 7.2

11. Which of the following statements is TRUE?

- A. Preferred shares will trade at a discount from par value when market rates are less than the dividend rate.
- B. Preferred shares will trade at a premium when market rate exceeds the dividend rate.
- C. Preferred shares will trade at par when the dividend rate does not equal the market rate.
- D. The market prices of preferred shares increase when market rates decline, and vice versa.

Answer: D Type: Concept Level of Difficulty: Medium LO: 7.2

12. Ontario Transportation Inc. has issued \$2.5 million in preferred shares with a par value of \$20 each and an annual dividend rate of 10 percent. The market value of the preferred shares is _____ if the required rate of return is 8 percent.

- A. \$3,125,000
- B. \$2,500,000
- C. \$2,000,000
- D. \$34,380,000 million

Answer: A Type: Calculation Level of Difficulty: Medium LO: 7.2

Explanation:

A.

$$MV = D_{pkp} \times BVPS_{PV} = \$20 \times 10\% \times \$2,500,000 / \$20 = \$3,125,000.00$$

B. Issue value

C. Transpose dividend rate with required rate=

$$\$20 \times 8\% \times \$2,500,000 / \$20 = \$2,000,000.00$$

D. BVPS used as number of shares outstanding in the computation

13. Wild Berries Inc.'s preferred shares have a par value of \$60 and are selling for \$50. What is the required rate of return if the preferred shares pay an annual dividend of 6 percent?

- A. 5.00%
- B. 6.00%
- C. 7.2%
- D. 11.11%

Answer: C Type: Calculation Level of Difficulty: Easy LO: 7.2

Explanation:

A. Transpose par value with market value

B. Confuse dividend rate with required rate of return

$$C. k = D_p / P_{ps} = 60 \times 6\% / 50 = 7.2\%$$

$$D. \$60 / \$45 - 1 = 33.33\%$$

14. Alpine Ski Equipments has 2 million preferred shares issued at a par value of \$40. The preferred shares are currently selling at \$33.25 per share and the required rate is 8.42 percent. What is the dividend rate?

- A. 7.00%
- B. 8.42%
- C. 9.00%

D. 10.13%

Answer: A Type: Calculation Level of Difficulty: Medium LO: 7.2

$$\frac{\$33.25 \times 8.42\%}{\$40} = 7\%$$

A. Dividend rate =

B. Confuse dividend rate and required rate of return

D. Transpose par value with market value

15. Montreal Growers Inc. issued 1 million preferred shares at a par value of \$20 and a dividend rate is 10%. If the risk free rate is 4% and the risk premium is 3%, what is the preferred share price?

A. \$ 50.00

B. \$ 28.57

C. \$ 35.00

D. \$ 14.00

Answer: A Type: Calculation Level of Difficulty: Medium LO: 7.2

A. $\$20 \times 0.1 / 0.04 = \$50$ B. $(\$20 \times 0.1) / (0.04 + 0.03) = \$28.57$ C. $(\$20 \times 0.07) / 0.04 = \$35.00$ D. $(\$20 \times 0.07) / 0.10 = \$14.00$

16. The 1.2 million preferred shares of Mighty Machines, which pay a dividend rate of 6.5 percent on a stated value of \$40, are currently worth \$42,000,000. What is the risk premium associated with these preferred shares if the risk free rate is 4.25 percent?

A. 1.97%

B. 2.25%

C. 2.57%

D. 3.18%

Answer: D Type: Calculation Level of Difficulty: Medium LO: 7.2

Explanation:

A. Transpose par value with market value

$$RP = \frac{\$40(6.5\% - 4.25\%)}{\$42,000,000 / 1,200,000} = 2.57\%$$

$$RP = \frac{\$40 \times 6.5\%}{\$42,000,000 / 1,200,000} - 4.25\% = 3.18\%$$

D.

17. Infinity, Inc. has 750,000 preferred shares outstanding, which pay a dividend rate of 5.25 percent. Currently, the market value of these preferred shares is \$22.5 million and the short-term government T-bills yield is 5 percent. What is the par value of these shares if investors require a risk premium of 3.75 percent?

A. \$7.14

- B. \$18.00
C. \$30.00
D. \$50.00

Answer: D Type: Calculation Level of Difficulty: Medium LO: 7.2

$$\frac{(\$22,500,000 / 750,000) * (5\% - 3.75\%)}{5.25\%} = \$7.1429$$

- A.
B. Transpose dividend rate with required rate

$$\$50 \text{ PV} = \frac{(\$22,500,000 / 750,000) \times (5\% + 3.75\%)}{5.25\%} = \$50 \text{ PV}$$

D.

18. The current market value of the 500,000 preferred shares of Clumsy Sports, Inc., is \$25 million. If the shares pay the quarterly dividend of \$1.25 on a par value of \$85 and the risk premium is 4.5 percent, what is the implied risk free rate?

- A. 4.00%
B. 4.50%
C. 5.00%
D. 5.50%

Answer: D Type: Calculation Level of Difficulty: Medium LO: 7.2

$$RF = \frac{\$5}{\$25,000,000 / 500,000} - 4.5\% = 5.5\%$$

D.

19. The current market value of the 500,000 preferred shares of Clumsy Sports, Inc., is \$25 million. If the shares pay an annual dividend of \$5 on a par value of \$85 and the risk free rate is 5.5 percent, what is the implied risk premium?

- A. 4.00%
B. 4.50%
C. 5.00%
D. 5.50%

Answer: B Type: Calculation Level of Difficulty: Medium LO: 7.2

$$RF = \frac{\$5}{\$25,000,000 / 500,000} - 4.5\% = 5.5\%$$

D.

20. Manic Corporation issued 400,000 preferred shares with a book value of \$10 million three years ago. The preferred shares pay an annual dividend of \$2. What is the required return if the current market value of these preferred shares is \$9.5 million?

- A. 8.42%

- B. 8.00%
- C. 5.26%
- D. 4.21%

Answer: A Type: Calculation Level of Difficulty: Medium LO: 7.2

Explanation:

A.

$$k = 29,500,000 / 400,000 = 8.42\%$$

- B. Transpose par value with market value
- C. \$10 million / \$9.5 million - 1 = 5.26%
- D. 4.21%

21. Manic Corporation issued 200,000 preferred shares with a book value of \$10 million three years ago. If the required return is 8.42% and the current market value of these preferred shares is \$9.5 million, what is the annual dividend?

- A. \$ 4.00
- B. \$ 4.71
- C. \$ 2.50
- D. Cannot be calculated

Answer: A Type: Calculation Level of Difficulty: Medium LO: 7.2

Explanation:

- A. $(9500000 * 8.42\%) / 200000 = \$4.00$
- B. $(10000000 * 9.42\%) / 200000 = \$4.71$
- C. $(10000000 - 9500000) / 200000 = \$2.5$

22. The Beautiful Mind Company's preferred stock is selling for \$30 per share. What is the expected dividend of year four if the required rate of return is 7.5 percent?

- A. \$2.00
- B. \$2.25
- C. \$3.00
- D. \$3.25

Answer: B Type: Calculation Level of Difficulty: Easy LO: 7.2

$$D_P = \$30 \times 7.5\% = \$2.25$$

$$D_P * CVIF(k_P, 4)$$

C.

23. The 800,000 preferred shares of Fantastic Services have a market value of \$9,192,000 and a book value of \$10,000,000. What is the dividend rate if the risk free rate is 3.15 percent and the risk premium is 3.65 percent?

- A. 7.40%
- B. 7.25%

C. 6.80%

D. 6.25%

Answer: D Type: Calculation Level of Difficulty: Medium LO: 7.2

Explanation:

$$D = \frac{\$9,192,000 * (3.15\% + 3.65\%)}{\$10,000,000} = 6.25\%$$

D.

Section 7.3 – Common Share Valuation using the Dividend Discount Model

24. Use the following two statements to answer this question:

I) There is no requirement that common shares pay dividends at all.

II) The level of dividend payment of common shares is discretionary.

A. I is incorrect, II is correct.

B. I is correct, II is incorrect.

C. I and II are incorrect.

D. I and II are correct.

Answer: D Type: Calculation Level of Difficulty: Medium LO: 7.3

25. Use the following two statements to answer this question:

I) The DDM assumes that common shares are valued according to the present value of their expected future dividends.

II) The DDM argues that the selling price at any point (say, time n) will equal the present value of all the expected future dividends from period n to infinity.

A. I is incorrect, II is correct.

B. I is correct, II is incorrect.

C. I and II are incorrect.

D. I and II are correct.

Answer: B Type: Concept Level of Difficulty: Difficult LO: 7.3

26. Which of the following statements is TRUE?

A. The only cash flows that an investor will receive until he or she sells the stock will be the dividends.

B. A firm's residual earnings technically belong to the preferred shareholders.

C. Corporations generally pay all their earnings as dividends.

D. Corporations typically reinvest none of their earnings to enhance future earnings.

Answer: A Type: Concept Level of Difficulty: Medium LO: 7.3

27. Which of the following is TRUE about the implicit assumption of the DDM that “investors are rational”?

I) It assumes that at each period of time, investors react rationally and value the share based on what they rationally expect to receive the next year.

II) It rules out “speculative bubbles” or what is colloquially known as the “bigger fool theorem.”

A. I is correct, II is incorrect.

B. I is incorrect, II is correct.

C. I and II are correct.

D. I and II are incorrect.

Answer: C Type: Concept Level of Difficulty: Difficult LO: 7.3

28. Which of the following is NOT a correct statement of the Constant Growth DDM?

A. It holds only when growth in dividends is expected to occur at the same rate indefinitely.

B. It holds only when $k_e < g$.

C. It is a version of the dividend discount model for valuing common shares that assumes that dividends grow at a constant rate indefinitely.

D. Only future estimated cash flows and estimated growth in these cash flows are relevant.

Answer: B Type: Concept Level of Difficulty: Medium LO: 7.3

29. The Dividend Discount Model (DDM) links common share prices to three important fundamentals: corporate profitability, the general level of interest rates, and risk. All else being equal, the DDM predicts that common shares prices will be lower

A. when profits are high.

B. when interest rates are lower.

C. when risk premium are lower.

D. None of the above

Answer: D Type: Concept Level of Difficulty: Medium LO: 7.3

30. Use the following two statements to answer this question:

I) A firm's sustainable growth rate decreases with higher profit margins, higher asset turnover, and higher debt.

II) A firm's sustainable growth rate can be estimated by multiplying the earnings retention ratio by the return on equity.

A. I is correct, II is incorrect.

B. I is incorrect, II is correct.

C. I and II are correct.

D. I and II are incorrect.

Answer: B Type: Definition Level of Difficulty: Medium LO: 7.3

31. Which of the following is a FALSE statement about the DDM?

A. It does not work well for firms that are non-cyclical in nature and often display steady growth in earnings and dividends.

B. It does not work well for firms in distress.

C. It does not work well for firms that are in the process of restructuring.

D. It does not work well for firms involved in acquisitions.

Answer: A Type: Concept Level of Difficulty: Medium LO: 7.3

32. How much would you pay for a share of stock today, if you expect it will pay a dividend of \$2.50 each year and will sell for \$58 one year from now? Assume your required rate of return on this stock is 13 percent.

A. \$60.50

B. \$55.50

C. \$53.54

D. \$49.59

Answer: A Type: Calculation Level of Difficulty: Easy LO: 7.3

Explanation:

A. $P_1 + D_1$

$$P_0 = \frac{\$2.5 + \$58}{(1 + 13\%)} = \$53.54$$

C.

33. How much would you pay for a share of stock today if you expect it will pay a dividend of \$2.50 each year and will sell for \$58 two years from now? Assume your required rate of return on this stock is 13 percent.

A. \$60.50

B. \$55.50

C. \$53.54

D. \$49.59

Answer: C Type: Calculation Level of Difficulty: Easy LO: 7.3

Explanation:

A. $P_1 + D_1$

B. $P_1 - D_1$

C. $P_0 = 2.5(1 + 13\%) + 2.5 + 58(1 + 13\%)^2$

34. You paid \$20 for one share of HyperTension, Inc. today. What is the expected one-year holding period return if the stock pays \$1.25 dividend and sells for \$21.50 one year from now?

A. 6.25%

B. 7.50%

C. 11.50%

D. 13.75%

Answer: D Type: Calculation Level of Difficulty: Easy LO: 7.3

Explanation:

A. D_1/P_0

$$k_c = \frac{\$1.25 + \$21.5}{\$20} - 1 = 13.75\%$$

D.

35. Jack had an investment return of -24 percent on a stock that he bought for \$100 a year ago. What is the sale price of the stock if he received a dividend of \$1.75 during the year?

A. \$72.75

B. \$74.25

C. \$76.00

D. \$77.75

Answer: B Type: Calculation Level of Difficulty: Easy LO: 7.3

$$= \$74.25 \quad P_1 = \$100 + \$100 \times (-24\%) - \$1.75 = \$74.25 \quad P_1 = \$100$$

B.

C. $P_0 - P_0 \cdot k_c$ D. $P_0 - P_0 \cdot k_c + D_1$

36. Charlotte purchased a share for \$50 a year ago. She received \$2.40 in dividends and sold the stock for \$52. If the inflation rate over the year was 2.6 percent, her exact real rate of return is

A. 6.04%

B. 8.8%

C. 11.4%

D. 16.28%

Answer: A Type: Calculation Level of Difficulty: Medium LO: 7.3

Explanation:

$$\frac{1.088}{1.026} - 1 = 6.04\%$$

then the real return

B. Nominal rate

C. Nominal rate + inflation rate

D. $(1 + \text{nominal rate}) \cdot (1 + \text{inflation}) - 1$

37. Which one of the following formulae is incorrect?

A. Dividend yield = $\frac{P_1 - P_0}{P_0}$

B. Cost of equity = $R_f + \text{Risk Premium}$

C. Cost of equity = Dividend yield + Capital Growth Rate

D. $P_0 = D_1/k$

Answer: A Type: Concept Level of Difficulty: Easy LO: 7.3

38. Toronto Skates, Inc. is offering a dividend of \$2.50 today and the stock sells for \$20. If the required rate of return is 8 percent what is the capital growth rate?

- A. 8%
- B. 20.5%
- C. 4.5%
- D. 12.5%

Answer: C Type: Calculation Level of Difficulty: Easy LO: 7.3

- A. $20/2.5 = 8\%$
- B. $2.5/20 + 8\% = 20.5\%$
- C. $2.5/20 - 8\% = 4.5\%$
- D. $2.5/20 = 12.5\%$

39. Poutine Professionals, Inc. has just paid a dividend of \$0.55 per share. The dividends are expected to grow at an annual rate of 5 percent indefinitely. What's today stock price if the required return is 12.5 percent?

- A. \$4.62
- B. \$7.33
- C. \$7.70
- D. \$11.55

Answer: C Type: Calculation Level of Difficulty: Easy LO: 7.3

Explanation:

A) D_1/k_c

$$k_c = \frac{\$0.55(1 + 5\%)}{(12.5\% - 5\%)} = \$7.70$$

C)

D) D_1/g

40. According to the DDM, if a firm increases its retention rate what happens to the firm's share price assuming no dividend growth and no earnings growth?

- A. The price will stay the same.
- B. The price will increase.
- C. The price will decrease.
- D. Cannot be determined.

Answer: C Type: Concept Level of Difficulty: Medium LO: 7.3

41. Toronto Skates Inc. is paying dividends on a regular basis with a constant growth rate. The dividend last year was \$ 1.00 and this year is \$1.25. If the required rate of return is 12%, what is the price of the stock?

- A. \$10.42
- B. \$8.33
- C. 5.00
- D. Cannot be calculated

Answer: D Type: Concept Level of Difficulty: Difficult LO: 7.3

- A. $1.25/0.12=\$10.42$
- B. $1/0.12=\$8.33$
- C. $1/0.2=\$4$

D. $g=D_1-D_0/D_0=25\%$ which is higher than 12%

42. BC Electronics, Inc. pays a constant dividend of \$2 every year. What will the stock sell for three years from now if the required rate of return is 9 percent?

- A. \$22.22
- B. \$21.30
- C. \$25.70
- D. \$28.78

Answer: A Type: Calculation Level of Difficulty: Easy LO: 7.3

Explanation:

$$P_0 \cdot (1 + k_e)^3$$

- B. D.
- C.

D. 43. Prairies Oil Sands, Inc. is expected to pay a dividend of \$1 in one year. If the dividend growth rate is 2 percent forever and the required return is 10 percent, what should the stock be sold for five years from now?

- E. A. \$13.53
- F. B. \$13.80
- G. C. \$14.08
- H. D. \$14.62

I. Answer: B Type: Calculation Level of Difficulty: Medium LO: 7.3

J. Explanation:

$$P_5 = \frac{\$1.1041}{10\% - 2\%} = \$13.8041$$

- L. B. Compute , then
- M. C. D_1 used as D_0 in the computation
- N.

- O. 44. The stock of Townships Ski Resorts, Inc. just paid a dividend of \$0.78. What is the expected capital gains yield if the stock is selling for \$28.25 today and the required rate of return is 15 percent?
- P. A. 13.62%
- Q. B. 12.30%
- R. C. 11.91%
- S. D. 10.73%
- T. Answer: C Type: Calculation Level of Difficulty: Medium LO: 7.3
- U. Explanation:

$$\text{Capital gains yield, } g = \frac{k_c * P_0 - D_0}{P_0 + D_0} = \frac{15\% * \$28.25 - \$0.78}{\$28.25 + \$0.78} = 11.91\%$$

W. C.

X.

- Y. 45. Toronto Skates's common stock is selling at \$22.22 per share. Investors expect to receive a dividend of \$1.80. The 90-day government T-bill yield is 4.3 percent. What is the dividend growth rate if the risk premium on comparable companies is 6.2 percent?

Z. A. 2.22%

AA. B. 2.40%

AB. C. 3.12%

AC. D. 3.54%

AD. Answer: B Type: Calculation Level of Difficulty: Medium LO: 7.3

AE. Explanation:

$$\text{Dividend growth rate, } g = (4.3\% + 6.2\%) - \frac{\$1.80}{\$22.22} = 2.40\%$$

AG. B.

AH.

- AI. 46. Gadgets, Inc. just paid a dividend of \$1.55. It expects its earnings and dividends to decline at a rate of 3 percent per year indefinitely. What is the value of the stock today if the required return is 12.5 percent?

AJ. A. \$9.70

AK. B. \$10.00

AL. C. \$16.32

AM. D. \$16.81

AN. Answer: A Type: Calculation Level of Difficulty: Medium LO: 7.3

$$P_0 = \frac{\$1.55 * (1 - 3\%)}{12.5\% + 3\%} = \$9.70$$

AP. A.

AQ. B. D_0 used as D_1 in the computation

AR. C. B) and D) combined

AS. D. (+g) used as (-g) in the computation

AT.

AU.47. The common stock of Atlantic Fishing currently sells for \$48 per share. The firm has a constant dividend growth rate of 6 percent. If the required rate of return is 15 percent, what is the expected dividend yield on the stock?

AV.A. 6.00%

AW. B. 8.49%

AX. C. 9.00%

AY.D. 15.00%

AZ. Answer: C Type: Calculation Level of Difficulty: Easy LO: 7.3

BA. Explanation:

$$\text{Dividend yield} = k_c - g = 15\% - 6\% = 9\%$$

BC. C.

BD. D. Confusing dividend yield and required rate of return

BE.

BF. 48. Atlantic Fishing common stock has just paid a dividend of \$1.8 per share and is selling for \$34.48 each. The firm expects its dividend to grow at a constant rate of 6.3 percent a year. What is the risk premium associated with the stock if the risk free rate is 4.25 percent?

BG. A. 7.27%

BH. B. 8.00%

BI. C. 11.52%

BJ. D. 11.85%

BK. Answer: B Type: Calculation Level of Difficulty: Medium LO: 7.3

BL. Explanation:

$$RP = \left[\frac{\$1.80 * (1.063)}{\$34.48} + .063 \right] - .0425 = 0.08$$

$$\frac{\$1.80}{\$34.48} + 6.3\% = 11.52\%$$

$$\frac{\$1.80 * (1 + 6.3\%)}{\$34.48} + 6.3\% = 11.85\%$$

BP.D)

BQ.

BR. 49. Maple Drinks has just announced a dividend of \$0.80 for this year and \$0.835 for the next year. Dividends are expected to grow at a constant rate indefinitely. What is the current stock price if the required return is 13.1 percent?

BS.A. \$8.55

BT.B. \$9.35

BU. C. \$9.57

BV. D. \$10.37

BW. Answer: C Type: Calculation Level of Difficulty: Medium LO: 7.3

$$\frac{D_1}{(1 + k_c)} + \frac{D_2 / (k_c - g)}{(1 + k_c)^2}$$

BY. A.

$$D_0 + \frac{D_1}{(1+k_c)} + \frac{D_2 / (k_c - g)}{(1+k_c)^2}$$

BZ. B.

$$P_0 = \frac{D_1}{k_c - g} = \frac{\$0.835}{13.10\% - 4.375\%} = \$9.57$$

CA. C. Compute , then

$$D_0 + \frac{D_1}{(k_c - g)}$$

CB. D.

CC.

CD. 50. Analysts announced earnings per share of \$4 for the coming year for Toronto Skates Inc. The company plans not to pay any dividends for the next three years. For the subsequent two years, TS plans on retaining 50 percent of its earnings and 25 percent of its earnings from that point forward. Retained earnings will be invested in projects with an expected return of 20 percent per year. If the required rate of return is 12 percent, then the price is:

CE. A. \$48.48

CF. B. \$67.30

CG. C. \$57.50

CH. D. \$59.09

CI. Answer: A Type: Calculation Level of Difficulty: Difficult LO: 7.3

CJ.

CK. Year	CL. Ear n i n g s	CM. D i v	CN. g
CO. 1	CP.4	CQ. 0	CR. 0.2
CS.2	CT.4 8	CU. 0	CV. 0.2
CW. 3	CX. 5.76	CY. 0	CZ. 0.2
DA. 4	DB. 6.34	DC. 3 1 7	DD. 0 1
DE. 5	DF.6 9 7	DG. 3 4	DH. 0 1

		8	
	DJ.7	DK	
	.	5	DL.
	3	4	0.0
DI.6	2	9	5

DM.

DN. A. $P = 3.17(1+12\%)^4 + 3.48(1+12\%)^5 + 5.49 + (5.49 \times 1 + 5\%(12\% - 5\%))$

$$(1+12\%)^6 = 48.48$$

DO. B. Using **earnings** instead of dividends

DP.C. Not adjusting for the **50%** retention rate

DQ. D. Not **discounting** the price correctly at the end of year 6

DR.

DS. 51. Lac Superior Enterprises has just paid a dividend of \$1.05 and will pay \$1.10 next year. Dividends are expected to grow at a constant rate indefinitely. What is the required rate of return if the stock is selling for \$30 today?

DT. A. 8.26%

DU. B. 8.43%

DV. C. 8.60%

DW. D. 8.92%

DX. Answer: B Type: Calculation Level of Difficulty: Medium LO: 7.3

$$\frac{D_0}{P_0} + g$$

$$k_c = \frac{\$1.10}{\$30} + 4.762\% = 8.43\%$$

$$\frac{D_1 * (1 + g)}{P_0} + g$$

EB. C.

EC.

ED. 52. BC Corporation common stock has just paid a dividend of \$2.20 per share. Its dividend is expected to grow at a rate of 5 percent per year indefinitely. The current stock price is \$30 and the risk premium associated with this stock is 8.7 percent. What is the implied risk free rate?

EE.A. 3.63%

EF.B. 3.70%

EG. C. 4.00%

EH. D. 4.42%

EI. Answer: C Type: Calculation Level of Difficulty: Medium LO: 7.3

$$RP - g$$

$$RF = \left(\frac{\$2.20 * (1 + 5\%)}{\$30} + 5\% \right) - 8.7\%$$

EL.C.

EM.

EN. 53. Zigzag Corporation's common stock is selling for \$22 per share in the market.

Zigzag's EPS is expected to be \$2 next year, and the required rate of return is 12 percent.

What is the present value of growth opportunities per share?

EO. A. \$5.33

EP.B. \$16.67

EQ. C \$20.00

ER. D. \$38.67

ES. Answer: A Type: Calculation Level of Difficulty: Easy LO: 7.3

$$PVGO = \$22 - \frac{\$2}{12\%} = \$5.33$$

EU. A.

EV.B. EPS_1/k_c EW. C. $P_0 - EPS_1$ EX. D. $P_0 + EPS_1/k_c$

EY.

EZ. 54. Suppose Delightful Inc.'s present value of growth opportunities per share is \$6 and its current share price is \$18. What is the firm's required rate of return if its expected EPS is \$2.25?

FA.A. 9.38%

FB.B. 12.16%

FC.C. 15.42%

FD. D. 18.75%

FE. Answer: D Type: Calculation Level of Difficulty: Easy LO: 7.3

$$\frac{EPS_1}{(P_0 + PVGO)}$$

$$k_c = \frac{\$2.25}{\$18 - \$6} = 18.75\%$$

FH. D.

FI.

FJ. 55. The market value of Monteregie Corporation's 1 million outstanding common shares is \$22.5 million. The firm is expected to have earnings of \$1,750,000 next year. The 90-day government T-bill yields 3.75 percent. What is the present value of growth opportunities if the risk premium is 8.4 percent?

FK. A. \$1.67

FL.B. \$8.10

FM. C. \$14.40

FN. D. \$20.83

FO. Answer: B Type: Calculation Level of Difficulty: Medium LO: 7.3

FP. Explanation:

$$PVG O = \frac{\$22,500,000}{1,000,000} - \frac{\$1,750,000 / 1,000,000}{12.15\%} = \$8.10$$

FR. B.

FS.C. EPS_1/kc FT.D. EPS_1/RP

FU.

FV. 56. The market value and book value of Visual Image, Inc.'s outstanding 2 million common shares are \$60 million and \$30 million, respectively. The company's recent net profit was \$3,500,000. What is the company's sustainable dividend growth rate if it uses a dividend payout ratio of 60 percent?

FW. A. 2.33%

FX. B. 3.50%

FY.C. 4.67%

FZ.D. 7.00%

GA. Answer: C Type: Calculation Level of Difficulty: Medium LO: 7.3

GB. Explanation:

GC. A. MV used as BV in the computation

$$g = 40\% \times 11.67\% = 4.67\%$$

GE. C. Compute retention ratio = $1 - 60\% = 40\%$, , and then

GF.D. Payout ratio used as retention ratio in the computation

GG.

GH. 57. DH Corporation had net earnings of \$200,000 this past year and paid \$80,000 dividends on the company's equity of \$1,800,000. What is growth rate of this company?

GI. A. 6.67%

GJ.B. 11.11%

GK. C. 4.44%

GL. D. 0%

GM. Answer: A Type: Calculation Level of Difficulty: Medium LO: 7.3

GN. Explanation:

GO. A. $g = 1 - 800000 / 2000000 * 200000 / 1800000 = 6.67\%$

GP.B. ROE

GQ. C. Payout ratio used as retention ratio

GR. D. 0%

GS.

GT. 58. Dream Homes Corporation had net earnings of \$200,000 this past year and paid \$80,000 dividends on the company's equity of \$1,800,000. Dream Homes has 500,000 shares outstanding with a current market value of \$5. What is the firm's present value of growth opportunities if the required rate of return is 10.08 percent?

GU. A. \$0.77

GV. B. \$0.84

GW. C. \$0.86

GX. D. \$0.90

GY. Answer: A Type: Calculation Level of Difficulty: Difficult LO: 7.3

$$ROE = \frac{\$200,000}{\$1,800,000} = 11.1111\%$$

$$EPS_1 = \frac{\$200,000}{500,000} \times (1 + 6.67\%) = \$0.4267$$

$$PVGO = \$5 - \frac{\$0.4267}{10.08\%} = \$0.77$$

HC.

HD. B. MV used as BV in the computation

HE. C. Payout ratio used as retention ratio in the computation

HF.D. B. and C combined

HG.

HH. 59. The DDM Company has an expected profit margin of 15 percent, turnover ratio of 2 and a leverage ratio of 0.5. The firm had an EPS of \$2 and paid a dividend of \$1.05 per share. What is DDM's sustainable growth rate?

HI. A. 8.125%

HJ. B. 7.875%

HK. C. 7.125%

HL. D. 6.875%

HM. Answer: C Type: Calculation Level of Difficulty: Medium LO: 7.3

HN. Explanation:

$$ROE = 15\% \times 2 \times 0.5 = 15\%$$

$$= 1 - \frac{\$2}{\$2} = 47.5\%$$

$$g = 47.5\% \times 15\% = 7.125\%$$

HQ.

HR.

HS. 60. Ontario Ice Corporation has an expected profit margin of 10 percent, turnover ratio of 3 and a leverage ratio of 0.50. The firm expects an EPS of \$3 next year and maintains a retention ratio of 60 percent. What should the stock sell for today if the required return is 15 percent?

HT. A. \$13.33

HU. B. \$20.00

HV. C. \$26.67

HW. D. \$30.00

HX. Answer: B Type: Calculation Level of Difficulty: Difficult LO: 7.3

HY. Explanation:

$$P_0 = \frac{\$1.2}{(15\% - 9\%)} = \$20$$

IA. B. Compute , , , then

IB. D. Retention ratio was used to find D_1

IC.

ID. 61. Maniac Corporation just paid a dividend of \$2 on its current EPS of \$6. Its projected net profit margin, asset turnover, and leverage ratio are 12.5 percent, 2.5, and 0.6, respectively. What is Maniac's required rate of return if the current price is \$34.60?

IE. A. 12.03%

IF. B. 12.39%

IG. C. 18.28%

IH. D. 19.00%

II. Answer: D Type: Calculation Level of Difficulty: Difficult LO: 7.3

IJ. Explanation:

IK. A. Payout ratio was used to find g , and D_0 was used instead of D_1 IL. B. Payout ratio was used to find g , then D_1

$$ROE = 12.5\% \times 2.5 \times 0.6 = 18.75\%$$

$$= 1 - \frac{1}{1.1875} = 0.087\%$$

$$k_c = \frac{\$2 \times (1 + 12.5\%)}{\$34.6} + 12.5\% = 19\%$$

IO. , then

IP.

IQ.

IR. 62. Nunavut Beach Resort has a net income of \$330,000 on sales of \$2,200,000. The firm has total assets of \$1,600,000, a book value of equity of \$1,200,000, and a dividend payout ratio of 65 percent. What is the firm's current market value if the required return is 21 percent?

IS. A. \$1.886 million

IT. B. \$2.067 million

IU. C. \$3.180 million

IV. D. \$8.091 million

IW. Answer: B Type: Calculation Level of Difficulty: Difficult LO: 7.3

IX. Explanation:

$$ROE = \frac{\$330,000}{\$2,200,000} \times \frac{\$2,200,000}{\$1,600,000} \times \frac{\$1,600,000}{\$1,200,000} = 27.5\%$$

$$D_1 = (\$330,000 \times 65\%) \times (1 + 9.625\%) = \$235,145.625$$

JA. , , then

$$P_0 = \frac{\$235,145.625}{(21\% - 9.625\%)} = \$2,067,214.29$$

JB.

JC. C. NI used as D_0 to find D_1 JD. D. Payout was used to find g

JE.

JF. 63. MacLean, Inc. currently pays no dividends. Today, the firm announced that it will pay its first dividend of \$1 per share in four years, then \$1.50 in each of the following three years, and the subsequent dividends are expected to grow at a constant rate of 5 percent per year. What is the stock price today if the risk free rate is 4 percent and the risk premium associated with this stock is 6 percent?

JG. A. \$17.93

JH. B. \$19.40

JI. C. \$31.50

JJ. D. \$34.73

JK. Answer: B Type: Calculation Level of Difficulty: Difficult LO: 7.3

JL. Explanation:

$$k_c = 4\% + 6\% = 10\%$$

$$P_0 = \frac{\$1 + \$1.5 * PVAF(10\%, 3)}{(1 + 10\%)^4} + \frac{\$1.5 * (1 + 5\%) / (10\% - 5\%)}{(1 + 10\%)^7} = \$19.40$$

JO.

JP. C. P_7 JQ. D. $PV(D_4 - D_7) + P_7$

JR.

JS. 64. Macaroni, Inc. announced that it would pay the following dividends over the next five years: \$0.50, \$0.75, \$1.50, \$3, and \$4. Afterwards, dividends will decline at a rate of 3 percent per year indefinitely. What is the firm's current stock price if the required rate of return is 13%?

JT. A. \$30.33

JU. B. \$24.25

JV. C. \$19.24

JW. D. \$17.73

JX. Answer: C Type: Calculation Level of Difficulty: Difficult LO: 7.3

JY. Explanation:

JZ. A. $PV(D_1 - D_5) + P_5$

$$P_0 = \frac{\$0.50}{(1 + 13)^1} + \frac{\$0.75}{(1 + 13)^2} + \frac{\$1.50}{(1 + 13)^3} + \frac{\$3.00}{(1 + 13)^4} + \frac{\$4.00 + \$4.00 * (1 - 3\%) / (13\% + 3\%)}{(1 + 13)^5} = \$19.24$$

KB.

C.

KC. D. $PV(D_1 - D_5) + P_5 * PVIF(k_c, 6)$

KD.

KE. 65. Junkies Corporation has just paid a dividend of \$0.90. Dividends are expected to grow at 20% for years one and two, 15% for years three and four, 10% for years five and

six, and 5% thereafter. What is the expected dividend for year 10 if the required return is 18 percent?

KF.A. \$2.40

KG. B. \$2.52

KH. C. \$2.65

KI.D. \$2.78

KJ. Answer: B Type: Calculation Level of Difficulty: Difficult LO: 7.3

KK. Explanation:

$$D_{10} = \$0.9 * (1 + 20\%)^2 * (1 + 15\%)^2 * (1 + 10\%)^2 * (1 + 5\%)^4 = \$2.52$$

KM. B.

KN. C. D11

KO. D. D12

KP.

KQ.66. VIP Corporation has just paid a dividend of \$1.50. Dividends are expected to grow at 20% for the first three years, 10% for the following two years. What is the expected growth rate for the subsequent years if the stock is selling for \$24.86 today and the required return is 17 percent?

KR. A. -1.07%

KS. B. -1.75%

KT. C. 8.00%

KU. D. 8.65%

KV. Answer: C Type: Calculation Level of Difficulty: Difficult LO: 7.3

KW. Explanation:

KX. A. $PV(P_5)$ used as P_5 in the computation

$$PV(D_{1-5}) = \frac{\$1.5 * (1.20)}{(1.17)^1} + \frac{\$1.5 * (1.20)^2}{(1.17)^2} + \frac{\$1.5 * (1.20)^3}{(1.17)^3} + \frac{\$1.5 * (1.20)^3 * (1.10)}{(1.17)^4} + \frac{\$1.5 * (1.20)^3 * (1.10)^2}{(1.17)^5} = \$7.69$$

$$P_5 = (24.86 - 7.68679) * 1.17^5 = 37.651364$$

$$37.65136431 = \frac{1.5 * 1.2^3 * 1.1^2 * (1 + g)}{.17 - g}$$

$$6.40 - 37.65g = 3.1363 + 3.1363g$$

$$3.2637 = 40.7863g$$

$$g = 8\%$$

LB.

LC.

LD. **Section 7.4 – Using Multiples to Value Shares: the Price-Earnings (P/E) Ratio**

LE. 67. Price-earnings (P/E) ratios can be estimated using which of the following?

LF. I. The required rate of return

LG. II. The expected growth rate of dividends

LH. III. The retention ratio

LI. A. I and II only

LJ. B. II and III only

LK. C. I and III only

LL. D. I, II and III

LM. Answer: D Type: Concept Level of Difficulty: Medium LO: 7.4

LN.

LO. 68. Which of the following is NOT true about the P/E ratio?

LP. A. A comparison of one company with its peers also involves a great deal of subjectivity regarding company-specific characteristics.

LQ. B. P/E ratios only work well on companies in the high growth stage of their lifecycle.

LR. C. P/E ratios are uninformative when companies have negative or very small earnings.

LS. D. The volatile nature of earnings implies a great deal of volatility in P/E multiples.

LT. Answer: B Type: Concept Level of Difficulty: Difficult LO: 7.4

LU.

LV. 69. Which of the following statements is FALSE?

LW. A. The higher the expected payout ratio, the higher the P/E.

LX. B. The higher the expected growth rate, g , the higher the P/E.

LY. C. The lower the required rate of return, k_c , the lower the P/E.

LZ. D. The relevant input is the expected earnings, not historical earnings.

MA. Answer: C Type: Concept Level of Difficulty: Medium LO: 7.4

MB.

MC. 70. Which one of the following is a limitation of the P/E ratio?

MD. A. Easy way to estimate the price of a firm.

ME. B. It compares the performance of stocks

MF. C. Ignores the magnitude or the sign of the earnings

MG. D. One of the most widely used relative pricing methods

MH. Answer: C Type: Concept Level of Difficulty: Easy LO: 7.4

MI.

MJ. 71. Which one of the following is NOT a fundamental factor that affects the P/E ratio directly?

MK. A. Expected payout ratio

ML. B. Required rate of return

MM. C. Preferred shares dividend

MN. D. Expected growth of dividend

MO. Answer: C Type: Concept Level of Difficulty: Easy LO: 7.4

MP.

MQ. 72. Suppose a firm has just reported an EPS of \$2.50 and expects to maintain a dividend payout ratio of 40 percent. What is the firm's price-earnings ratio if its return on equity is 12 percent and the required return is 11.5 percent?

MR. A. 11.50

MS. B. 9.30

MT. C. 7.20

MU. D. 5.97

MV. Answer: B Type: Calculation Level of Difficulty: Easy LO: 7.4

MW. Explanation:

$$\frac{P}{E} = \frac{P_0}{EPS} = \frac{\$1.072 / \$2.68}{11.5\% - 7.20\%} = 9.30$$

MX. B. Compute retention ratio = $1 - 40\% = 60\%$, ,

MY. D. Payout ratio was used to find g

MZ.

NA. 73. Suppose a firm has just reported an EPS of \$2.50 and expects to maintain a dividend payout ratio of 40 percent. If the firm's price-earnings ratio is 9.3 and its return on equity is 12 percent what's its required rate of return?

NB. A. 13.80%

NC. B. 11.5%

ND. C. 13.35%

NE. D. 12%

NF. Answer: B Type: Calculation Level of Difficulty: Medium LO: 7.4

$$g = 12\% \times 60\% = 7.2\%$$

$$r = \left[\left(\frac{1.072}{2.68} \right) / 9.30 \right] + 7.2\% = 11.50\%$$

NI.

NJ. C. Using initial D0 instead of D1.

NK.

NL. 74. Suppose a firm's price/earnings ratio is 16. It has just paid a dividend of \$1.80 per share to maintain a 45 percent payout ratio. What is the firm's current market price if its return on equity is 12 percent?

NM. A. \$68.22

NN. B. \$67.46

NO. C. \$66.54

NP.D. \$65.78

NQ. Answer: A Type: Calculation Level of Difficulty: Medium LO: 7.4

$$EPS_1 = \frac{\$1.80 * (1 + 6.60\%)}{45\%} = \$4.264$$

$$P_0 = 16 \times \$4.264 = \$68.22$$

NT.

NU. B. Payout ratio was used to find g

NV.

NW. 75. Suppose a firm's price/earnings ratio is 12. It has just paid a dividend of \$2 per share to maintain a 40 percent payout ratio. What is the firm's return on equity if its price is \$65?

NX. A. 13.89%

NY. B. 20.83%

- NZ. C. 34.25%
 OA. D. 38.89%
 OB. Answer: A Type: Calculation Level of Difficulty: Medium LO: 7.4

OC. A. $k = (6512 \times 0.42) - 1(1 - 0.4) = 13.89\%$

OD. C. By taking $.6 \times 2$ as the dividend

OE.

OF. 76. Suppose a firm's price/earnings ratio is 10. It expects to pay a dividend of \$1.20 per share to maintain a 60 percent payout ratio. What is the firm's required return if its return on equity is 13.5 percent?

OG. A. 14.10%

OH. B. 13.20%

OI. C. 12.30%

OJ. D. 11.40%

OK. Answer: D Type: Calculation Level of Difficulty: Easy LO: 7.4

OL. Explanation:

$$k_c = \frac{0.60}{10} + 0.054 = 11.4\%$$

ON. D. Compute , then

OO.

OP. 77. Polar Express Corporation has just reported a net income of \$400,000. It has 250,000 common shares outstanding with a book value of \$2 million. The firm always maintain a retention ratio of 25 percent. What is the firm's price-earning ratio if its required return is 10 percent?

OQ. A. 5

OR. B. 10

OS. C. 15

OT. D. 20

OU. Answer: C Type: Calculation Level of Difficulty: Medium LO: 7.4

OV. Explanation:

$$\frac{P}{E} = \frac{0.75}{10\% - 5\%} = 15 \quad 20\%$$

OX. C. Compute, , then

OY.

OZ. 78. Union Enterprise has an expected profit margin of 12 percent, turnover ratio of 1.5 and a leverage ratio of 0.8. Union plans to distribute 45 percent of its expected earnings of \$1 million as a dividend next year. What is the firm's P/E ratio if the risk free rate is 4.75 percent and the risk premium associated with the shares is 6.75 percent?

PA. A. 8.96

PB. B. 10.48

PC. C. 12.57

PD. D. 15.23

PE. Answer: C Type: Calculation Level of Difficulty: Medium LO: 7.4

PF. Explanation:

$$ROE = 12\% \times 1.5 \times 0.8 = 14.4\%$$

$$\frac{P}{E} = \frac{0.45}{11.5\% - 7.92\%} = 12.57$$

PI. , then

PJ.

PK. **Section 7.5 – Value common shares using additional relative value ratios.**

PL. 79. Why did the book to market ratio become obsolete during the 1980-1990 period?

PM. A. Change in accounting rules.

PN. B. The high performance of the stock market.

PO. C. Inflation distorted the equity book value.

PP. D. Managers use more sophisticated method of valuations.

PQ. Answer: C Type: Concept Level of Difficulty: Easy LO: 7.5

PR.

PS. 80. Which one of the following is **NOT** a relative value ratio?

A. Sales to price ratio

B. Book to market ratio

C. Price to EBIT ratio

D. Interest expense to assets ratio

PT. Answer: D Type: Concept Level of Difficulty: Easy LO: 7.5

PU.

PV. Practice Problems

PW. 81. In what ways are preferred shares different from common shares?

PX. Type: Concept Level of Difficulty: Medium LO: 7.1

PY. Suggested answer:

PZ. I. Preferred shareholders rarely have any voting rights

QA. II. Preferred shareholders are paid dividends of a fixed amount, based on the stated par value and a stated dividend rate, at regular intervals indefinitely.

QB. III. Preferred shareholders have preference over common shareholders with respect to income and assets (in the event of liquidation). No dividend payments can be made to common shareholders until preferred shareholders have been paid the dividends they are due in entirety.

QC.

QD. 82. What are the two basic types of Dividend Discount Models?

QE. Type: Concept Level of Difficulty: Medium LO: 7.3

QF. Suggested answer:

QG. I. Constant Growth DDM – Dividends are assumed to grow at a constant rate indefinitely.

QH. II. Multiple Stage Growth DDM – Dividends are assumed to grow at a higher rate up to the beginning of a certain period then followed by constant growth to infinity.

QI.

QJ. 83. Explain how earnings are implicitly considered in the DDM model.

QK. Type: Concept Level of Difficulty: Medium LO: 7.3

QL. Suggested answer:

QM. The DDM assumes that the price of the stock depends on future dividends only. Earnings are considered in the DDM because the amount that is retained in the firm will be invested toward payment of future dividends.

QN.

QO. 84. What is the sustainable growth rate?

QP. Type: Definition Level of Difficulty: Medium LO: 7.3

QQ. Suggested answer:

QR. The sustainable growth rate is the product of the company's return on equity and the retention ratio. This measure attempts to estimate the growth in earnings (dividends) that will be positively related to the proportion of each dollar of earnings reinvested in the company times the return earned on reinvested funds.

QS.

QT. 85. Explain the difference between required rate of return and growth rate, and show the relationship between the two.

QU. Type: Concept Level of Difficulty: Easy LO: 7.3

QV. Suggested answer:

QW. The required rate of return is the return that an investor is expecting from his/her investment in the asset. It represents the compensation for the risk and the opportunity cost the investor faces. The growth rate is the amount of return that the firm is earning from investing in positive NPV projects. The more stable the growth rate of the firm, the lower the required rate of return demanded by investors.

QX.

QY. 86. What factors impact the P/E ratio, and what is the direction of the impact?

QZ. Type: Concept Level of Difficulty: Medium LO: 7.4

RA. Suggested answer:

RB. I. The expected dividend payout ratio – the higher the expected payout ratio, the higher the P/E ratio.

RC. II. The required rate of return – The higher the required rate of return, the lower the P/E ratio.

RD. III. The expected growth rate – The higher the expected growth rate, the higher the P/E ratio.

RE.

RF. 87. If you were using a constant-dividend growth model to price a stock, what would happen if the growth rate was greater than the required rate of return?

RG. Type: Concept Level of Difficulty: Difficult LO: 7.3

RH. Suggested answer:

RI. If the growth rate exceeds the required rate of return, the model will give you a negative stock price. This is clearly wrong. This result would indicate that the model being used to value the stock price is inappropriate for the situation.

RJ.

RK. 88. Explain how an evolution in accounting rules will help in the use of relative pricing methods.

RL. Type: Concept Level of Difficulty: Medium LO: 7.5

RM. Suggested answer:

RN. As accounting rules evolve, more analysts will use relative methods. This is mainly because improvements in accounting methods means the figures are more representative of the truth and there is less opportunity to use “creative” accounting as a bias.

RO.

RP.89. Explain how the retention ratio affects the future dividends, and hence, the price of the stock.

RQ. Type: Concept Level of Difficulty: Medium LO: 7.5

RR. Suggested answer:

RS. The retention ratio represents the amount of earnings that the firm reinvests. Investments earning an ROE rate, which is higher than the required rate of return, will increase the level of cash flows for the firm, resulting in an increase in the price of the stock.

RT.

RU. 90. The market value and the book value of White Elephant’s one million preferred shares are \$40,000,000 and \$35,000,000, respectively. The preferred shares pay an annual dividend of 8 percent. What is the risk premium associated with these shares if the risk free rate is 3.25 percent?

RV. Type: Calculation Level of Difficulty: Medium LO: 7.3

$$PV = \frac{\$35,000,000}{1,000,000} = \$35$$

$$P_{ps} = \frac{\$40,000,000}{1,000,000} = \$40$$

$$D_p = \$35 \times 8\% = \$2.8$$

$$k_p = \frac{\$2.8}{\$40} = 7\%$$

$$RP = 7\% - 3.25\% = 3.75\%$$

SB. The risk premium,

SC.

SD. 91. Marvellous Ideas, Inc. is selling for \$18.33 per share. The required rate of return on the stock is 10 percent. What is the expected dividend in year five when the earnings and dividends are expected to decline at an annual rate of 2.5 percent indefinitely?

SE. Type: Calculation Level of Difficulty: Medium LO: 7.3

$$\begin{aligned} P_0 &= \frac{D_1}{k_c - g} = \frac{D_0 * (1 + g)}{k_c - g} & P_0 \\ P_0 * (k_c - g) &= D_0 * (1 + g) & P_0 \\ 35 \quad D_0 &= \frac{P_0 * (k_c - g)}{(1 + g)} = \frac{\$18.33 * (10\% + 2.5\%)}{(1 - 2.5\%)} = \$2.35 & D_0 \\ D_5 &= D_0 * (1 + g)^5 = \$2.35 * (1 - 2.5\%)^5 = \$2.07 & D_5 \end{aligned}$$

SH.

SI. 92. Elves Corporation has just paid a dividend of \$1.25. Dividends are expected to grow at 15% for years 1-3, 30% for years 4-6, 10% for years 7-8, and 4% thereafter. What should the stock sell for today if the required return is 16 percent?

SJ. Type: Calculation Level of Difficulty: Medium LO: 7.3

$$D_1 = \$1.25 * (1.15) = \$1.4375, D_2 = \$1.4375 * (1.15) = \$1.6531, D_3 = \$1.6531 * (1.15) = \$1.9011, \\ D_4 = \$1.9011 * (1.30) = \$2.4714, D_5 = \$2.4714 * (1.30) = \$3.2128, D_6 = \$3.2128 * (1.30) = \$4.1767, \\ D_7 = \$4.1767 * (1.10) = \$4.5944, D_8 = \$4.5944 * (1.10) = \$5.0538, D_9 = \$5.0538 * (1.04) = \$5.2560 \\ P_8 = \frac{D_9}{k_c - g} = \frac{\$5.2560}{16\% - 4\%} = \$43.80 \\ P_0 = \frac{\$1.4375}{(1.16)} + \frac{\$1.6531}{(1.16)^2} + \frac{\$1.9011}{(1.16)^3} + \frac{\$2.4714}{(1.16)^4} + \frac{\$3.2128}{(1.16)^5} + \frac{\$4.1767}{(1.16)^6} + \frac{\$4.5944}{(1.16)^7} + \frac{\$5.0538 + \$43.80}{(1.16)^8} = \$24.82$$

SL.

SM.

SN. 93. Rustic Corporation has earnings per share of \$2.50 and paid a dividend of \$1.75 per share. The firm's ROE and P/E are 15% and 20, respectively. Calculate the following:

SO. A. The current stock price

SP. B. The required rate of return

SQ. C. The dividend yield

SR. Type: Calculation Level of Difficulty: Medium LO: 7.3

$$EPS_1 = \$2.5 * (1 + 4.5\%) = \$2.6125$$

$$= \$2.6125 \times 20 = \$52.25$$

$$k_c = \frac{D_1}{P_0} + g = \frac{\$2.6125 * 70\%}{\$52.25} + 4.5\% = 8\%$$

$$= \frac{D_1}{P_0} = \frac{\$1.82875}{\$52.25} = 3.5\%$$

SW. C. The dividend yield =

SX.

SY. 94. Zesty Corporation has a net income of \$320,000 on sales of \$3,000,000. The firm has total assets of \$2,000,000, the book value of equity of \$1,600,000. It has just paid a dividend of \$1.1 per share to maintain a payout ratio of 55 percent. The 90-day government T-bill yield is 5.25 percent. Determine the following if the firm's P/E ratio is 10:

SZ. A. The number of shares outstanding

TA. B. Sustainable growth rate

TB. C. Earnings per share: lagging and leading EPS

TC. D. Price of the stock today

TD. F. Required rate of return

TE.G. Risk premium of the stock

TF. Type: Calculation Level of Difficulty: Difficult LO: 7.3

$$= \frac{\$320,000 \times 55\%}{\$1.1} = 160,000$$

TH. A. The number of shares outstanding

TI. B. To determine the sustainable growth rate, we need to find the retention ratio and the

$$= 1 - 55\% = 45\%$$

$$= \frac{\$320,000}{\$3,000,000} \times \frac{\$3,000,000}{\$2,000,000} \times \frac{\$2,000,000}{\$1,600,000} = 20\%$$

$$g = 20\% \times 45\% = 9\%$$

$$EPS_0 = \frac{\$320,000}{160,000} = \$2.00$$

$$EPS_1 = \$2 \times (1 + 9\%) = \$2.18$$

$$P_0 = \$2.18 \times 10 = \$21.80$$

$$k_c = \frac{\$2.18 \times 55\%}{\$21.80} + 9\% = 14.5\%$$

$$RP = 14.5\% - 5.25\% = 9.25\%$$

TQ. G. The risk premium,

TR.

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UF.

Chapter 8: Risk, Return, and Portfolio Theory

Multiple Choice Questions

Section 8.1 – Measuring returns

1. Use the following two statements to answer this question:

I. Risk is the possibility of incurring harm.

II. Ex post returns are expected returns while ex ante returns are future returns.

A. I and II are correct.

B. I and II are incorrect.

C. I is correct, II is incorrect.

D. I is incorrect, II is correct.

Answer: C Type: Definition Level of Difficulty: Easy LO: 8.1

2. Which of the following is NOT a correct statement of income yield?

A. It is one of the two components of the total return on an investment.

B. It is the return earned in the form of a periodic cash flow received by the investors.

C. These periodic cash flows are interest payments from bonds and dividends from equities.

D. It measures the periodic cash receipts by dividing it by the selling price of the security.

Answer: D Type: Concept Level of Difficulty: Medium LO: 8.1

3. Which of the following is NOT a true statement?

A. The capital gain yield measures the appreciation in the price of the asset from some starting price.

B. Common shares should lose from inflation over the long run as their prices and cash flows are not fixed.

C. The capital loss yield measures the depreciation in the price of the asset from the purchase price.

D. The addition of the capital gain (or loss) yield explains why the yield gap between equities and bonds has varied so much over time.

Answer: B Type: Concept Level of Difficulty: Medium LO: 8.1

4. Which of the following is a FALSE statement?

A. Paper losses are capital losses that people accept as losses before they actually sell and realize them.

B. A day trader is someone who buys and sells based on intraday price movements.

C. Mark to market refers to carrying securities at the current market value regardless of whether they are sold or not.

D. The total return including the paper gains and losses over the relevant investment horizon reflects the economic value of past investment decisions.

Answer: A Type: Concept Level of Difficulty: Medium LO: 8.1

5. Which of the following statements is TRUE?

A. The geometric mean measures the average annual rates of return while the arithmetic mean measures the compound growth rate over multiple time periods.

B. The more the returns vary, the bigger the difference between the arithmetic and geometric mean will be. The difference is dependent on the relevant investment horizon.

C. The geometric mean is appropriate when we are trying to estimate the typical return for a given period.

D. The arithmetic mean is a better average return estimate when we are interested in the rate of return performance of an investment over time.

Answer: B Type: Concept Level of Difficulty: Medium LO: 8.1

6. Melanie bought a share of MPT Company for \$34.28 one year ago. The stock paid a quarterly dividend of \$0.60 throughout the year. What is the income yield if the stock is selling for \$37.50 today?

A. 1.60%

B. 1.75%

C. 6.40%

D. 7.00%

Answer: D Type: Calculation Level of Difficulty: Easy LO: 8.1

Explanation:

A. Single dividend payment / P_1

B. Single dividend / P_0

C. P_1 used as P_0 in the computation of IY in D)

D. Income yield, $IY = (\$0.60 \times 4) / \$34.28 = 7.00\%$

7. Laura purchased a share of MVP Company for \$26.43 one year ago. The stock paid a quarterly dividend of \$0.50 during the year. What is the capital gain yield if the current stock price is \$28.26?

A. 6.48%

B. 6.92%

C. 7.57%

D. 14.49%

Answer: B Type: Calculation Level of Difficulty: Easy LO: 8.1

Explanation:

$= \frac{\$28.26 - \$26.43}{\$26.43} = 6.92\%$

B. Capital gain yield

C. Income yield

D. Total return

8. Steve bought a share of Toronto Skates Inc. three years ago for \$45.00. He was paid two annual dividends of \$4.50 in the last two years. If the stock price today is \$ 48.50, what is the annual holding period return of the stock?

A. 7.78%

B. 15.56%

C. 27.78%

D. 9.26%

Answer: D Type: Calculation Level of Difficulty: Easy LO: 8.1

Explanation:

A. $45.0048.5-1=7.78\%$

B. $45.00+4.548.5-1=17.78\%$

$$\left[\frac{(48.5 - 45) + 4.5 + 4.5}{45} \right] \times \frac{1}{3} = 9.26\%$$

D.

9. Steve bought a share of Toronto Skates Inc. three years ago for \$45.00. He was paid two annual dividends of \$4.50 in the last two years. If the stock price today is \$ 48.50, calculate the three year's income yield, capital gain and total return.

- A. IY=7.78%, CGY=20.00%, TR=27.78
- B. IY=20.00% , CGY=9.26%, TR=29.26%
- C. IY=20.20%,CGY=7.78%, TR=27.78%
- D. IY=7.78%, CGY=9.26%, TR=17.04%

Answer: C Type: Calculation Level of Difficulty: Medium LO: 8.1

Explanation:

C. $IY=4.5+4.545=20.00\%$; $CGY=48.545-1=7.78\%$; $TR=IY+CGY=27.78\%$

10. Sandy paid \$47.38 for one share of EMH Company one year ago. The stock paid four quarterly dividends of \$1.00 each during the year, and is selling for \$49.50 now. What are the income yield and capital gain yield for EMH over the past year?

- A. Income yield = 4.28%; capital gain yield = 8.08%
- B. Income yield = 8.08%; capital gain yield = 4.28%
- C. Income yield = 4.47%; capital gain yield = 8.44%
- D. Income yield = 8.44%; capital gain yield = 4.47%

Answer: D Type: Calculation Level of Difficulty: Medium LO: 8.1

Explanation:

- A. Transpose IY with CGY in B)
- B. $IY = D/P_1$; $CGY = (P_1 - P_0)/P_1$
- C. Transpose IY with CGY in D)

$$CGY = \frac{\$49.5 - \$47.38}{\$47.38} = 4.47\%$$

D. Income yield,; and capital gain yield,

11. A stock selling for \$12.00 today and expected to pay a \$1.50 dividend and capital gain of 5% over a year is supposed to sell at:

- A. \$ 13.50
- B. \$ 14.10
- C. \$ 12.60
- D. \$ 15.18

Answer: C Type: Calculation Level of Difficulty: Easy LO: 8.1

Explanation:

- A. $\$12 + 1.5 = \$13.5$
- B. $\$12 (1 + 0.05) + 1.5 = \$14.10$
- C. $\$12(1 + 0.05) = \$12.6$
- D. $(12 + 1.5)(1 + 1.5/12) = \$15.18$

12. A stock selling for \$20.00 today and expected to have an income (dividend) yield of 3%, and a capital gain yield of 5% over a year is supposed to sell at:

- A. \$21.60
- B. \$20.60
- C. \$21.00
- D. \$20.40

Answer: C Type: Calculation Level of Difficulty: Easy LO: 8.1

Explanation:

- A. $[\$20(1 + 0.03) + \$20(1 + 0.05)] - \$20 = \$21.60$
- C. $\$20(1 + 0.05) = \$21.00$
- D. $\$20(1 + 0.05 - 0.03) = \$20.40$

13. Connie bought 400 shares of ABC Company for \$9,288 one year ago. ABC paid a quarterly dividend of \$0.40 per share throughout the year, and is currently trading at \$24.85 per share. What are the income yield, capital gain yield, and total return for Connie's investment?

- A. Income yield = 6.44%; capital gain yield = 6.56%; total return = 13.00%
- B. Income yield = 6.56%; capital gain yield = 6.44%; total return = 13.00%
- C. Income yield = 6.89%; capital gain yield = 7.02%; total return = 13.91%
- D. Income yield = 7.02%; capital gain yield = 6.89%; total return = 13.91%

Answer: C Type: Calculation Level of Difficulty: Medium LO: 8.1

Explanation:

A. $IY = D/P_1$; $CGY = (P_1 - P_0)/P_1$; and $TR = IY + CGY$

$$CGY = \frac{\$24.85 - \$23.22}{\$23.22} = 7.02\%$$

- C. Income yield, ; capital gain yield, ;
Total return, $TR = 6.89\% + 7.02\% = 13.91\%$
- D. Transpose IY with CGY in C)

14. Suppose you have a total return of 8 percent on the 500 shares of XYZ Company that you bought for \$9,590 last year. XYZ paid four equal quarterly dividends during the year. What would be the quarterly dividend if the current stock price is \$18.64 per share?

- A. \$0.50
- B. \$0.52
- C. \$0.54
- D. \$0.56

Answer: B Type: Calculation Level of Difficulty: Medium LO: 8.1

Explanation:

$$P_0 = \frac{\$9,590}{500} = \$19.18$$

$$CGY = \frac{\$18.64 - \$19.18}{\$19.18} = -2.8154\%$$

Capital gain yield, ,

$$D = \frac{\$19.18 \times 10.8154\%}{4} = \$0.5186$$

Quarterly dividend,

15. You made an investment in your RRSP account of \$3,000 in an ETF that pays quarterly dividends. The price of each unit the day of the investment is \$60. The following year you invested another \$2,000 in your RRSP account at a price of \$ 70 a unit. How much you hold in your account two years after your initial investment if you know that the income yield of the ETF is 5% and an ETF unit is trading at \$75 today?

- A. \$6500.00
- B. \$6292.86
- C. \$5992.86
- D. \$6042.86

Answer: B Type: Calculation Level of Difficulty: Medium LO: 8.1

Explanation:

A. $3000 \times 60 \times 75 + 2000 \times 60 \times 75 + 3000 + 2000 \times 0.05 = 6500$

B. $3000 \times 60 \times 75 + 2000 \times 70 \times 75 + 3000 + 5000 \times 0.05 = 6292.86$

C. $3000 \times 60 \times 75 + 2000 \times 60 \times 75 + 2000 \times 0.05 = 5992.86$

$$D. 300060 \times 75 + 200060 \times 75 + 3000 \times 0.05 = 6042.86$$

16. The capital gain yield of an equity security is 9.27 percent. The security paid a quarterly dividend of \$0.55 per share during the year. What is the current price of the security if the total return is 13.76 percent?

- A. \$12.25
- B. \$13.38
- C. \$49.00
- D. \$53.54

Answer: D Type: Calculation Level of Difficulty: Medium LO: 8.1

Explanation:

A. P_0 in B)

B. One dividend instead of 4 dividends used in the computation of P_0 , and then P_1

$$IY = 13.76\% - 9.27\% = 4.49\%$$

$$P_1 = \frac{\$0.55 \times 4}{4.49\%} = \$49$$

$$P_1 = \$49 \times (1 + 9.27\%) = \$53.54$$

Current price,

17. A year ago, you bought some shares of CIA Company, which pays equal quarterly dividends. The income yield and the capital gain yield are 4.38 percent and 9.5 percent, respectively. The current price of CIA is \$18. What was the quarterly dividend that CIA paid during the year?

- A. \$0.18
- B. \$0.41
- C. \$0.72
- D. \$1.64

Answer: A Type: Calculation Level of Difficulty: Medium LO: 8.1

$$P_0 = \frac{\$18}{(1 + 9.5\%)} = \$16.4384$$

$$= \frac{\$16.4384 \times 4.38\%}{4} = \frac{\$0.72}{4} = \$0.18$$

Quarterly dividend

- B. Transpose of IY and CGY in the computation
- C. 4 times the dividend computed in A)
- D. 4 times the dividend computed in B)

18. The income yield and capital gain yield of a stock are 4.90 percent and 7.37 percent, respectively. The stock paid a quarterly dividend of \$0.65 per share during the year. What should the stock sell for today?

- A. \$35.28
- B. \$37.01
- C. \$53.06
- D. \$56.97

Answer: D Type: Calculation Level of Difficulty: Medium LO: 8.2

Explanation:

A. P_0 in B)

B. Transpose CGY with IY in the computation of P_0 , and then P_1

$$P_0 = \frac{\$0.65 \times 4}{4.9\%} = \$53.06$$

$$P_1 = \$53.06 * (1 + 7.37\%) = \$56.97$$

Current price,

19. The following table shows the closing prices and daily returns of Toronto Skates, Inc. over a week:

Day	Closing Price	Returns
Monday	35.20	1.15%
Tuesday	34.90	-0.85%
Wednesday	37.00	6.02%
Thursday	35.00	-5.41%
Friday	35.10	0.29%

Calculate the weekly geometric and arithmetic returns of Toronto Skates, Inc. (your answer should be four decimals, margin of error is +/- 0.0050%)

- A. GM=0.2400% and AM=0.1728%
- B. GM=-0.2841% and AM=0.1728%
- C. GM=0.1728% and AM=-0.2841%
- D. GM=0.1728% and AM=0.2400%

Answer: D Type: Calculation Level of Difficulty: Easy LO: 8.2

Explanation:

$$GM = 1 + 1.15\% - 0.85\% + 6.02\%(1 - 5.41\%)(1 + 0.29\%) - 1 = 0.1728\%$$

$$AM = 1.15\% - 0.85\% + 6.02\% - 5.41\% + 0.29\% \div 5 = 0.24\%$$

20. La Maudite Corporation's annual returns for the past five years were: 11.5%, 18%, -12%, -16.5%, and 28%. What are the arithmetic and geometric average annual returns for La Maudite over the five-year period?

- A. Arithmetic mean = 5.80%; geometric mean = 4.35%
- B. Arithmetic mean = 4.35%; geometric mean = 5.80%
- C. Arithmetic mean = 17.20%; geometric mean = 17.05%
- D. Arithmetic mean = 17.05%; geometric mean = 17.20%

Answer: A Type: Calculation Level of Difficulty: Easy LO: 8.2

$$AM = \frac{11.5\% + 18\% - 12\% - 16.5\% + 28\%}{5} = 5.80\%$$

$$GM = [(1.115) * (1.18) * (0.88) * (0.835) * (1.28)]^{1/5} - 1 = 4.35\%$$

Geometric mean,

- B. Transpose AM with GM in A)
- C. Negative returns taken as positive returns in the computation of AM and GM
- D. Transpose AM with GM in C)

21. You have observed the following for Montreal Smoked Meat Corporation:

	Closing Price
May 4, 2007	\$25.09
May 11, 2007	\$26.37
May 18, 2007	\$25.68
May 25, 2007	\$26.95
June 1, 2007	\$27.50
June 8, 2007	\$26.77
June 15, 2007	\$27.45

What are the arithmetic and geometric average weekly returns over the 6-week period?

- A. Arithmetic mean = 3.317%; geometric mean = 3.309%
- B. Arithmetic mean = 3.309%; geometric mean = 3.317%
- C. Arithmetic mean = 1.559%; geometric mean = 1.510%
- D. Arithmetic mean = 1.510%; geometric mean = 1.559%

Answer: C Type: Calculation Level of Difficulty: Medium LO: 8.2

Explanation:

- A. Negative returns taken as positive returns in the computation of AM and GM
- B. Transpose AM with GM in A)
- C. Compute the 6 weekly returns from the closing prices: 5.102%, -2.617%, 4.945%, 2.041%, -2.655%, 2.540%

$$AM = \frac{5.102\% - 2.617\% + 4.945\% + 2.041\% - 2.655\% + 2.540\%}{6} = 1.559\%$$

$$GM = [(1.05102) * (0.97383) * (1.04945) * (1.02041) * (0.97345) * (1.0254)]^{1/6} - 1 = 1.510\%$$

D. Transpose AM with GM in C)

22. The geometric average quarterly return of ROM Company was 5 percent for the previous year. What is the return for the third quarter if the returns for the first, second and fourth quarters are 10 percent, -9.05 percent, and 8 percent, respectively?

- A. -6.18%
- B. -7.05%
- C. 11.05%
- D. 12.50%

Answer: D Type: Calculation Level of Difficulty: Medium LO: 8.2

Explanation:

- A. Negative return taken as positive return in the computation
- B. A and C combined

$$\text{The 3rd quarter return} = \frac{(1 + 5\%)^4}{(1 + 10\%) * (1 - 9.05\%) (1 + 8\%)} - 1 = 12.5\%$$

D.

23. The geometric average daily return for Grumpy, Inc. was 3 percent for this past week. Grumpy's stock was traded at \$18.82 when the market closed on Friday. The daily returns for Monday through Thursday are 5 percent, 2 percent, -10 percent, and 8 percent, respectively. What is the opening price of Grumpy on Friday?

- A. \$16.68
- B. \$16.90
- C. \$16.94
- D. \$17.11

Answer: B Type: Calculation Level of Difficulty: Difficult LO: 8.2

Explanation:

$$= \frac{(1 + 3\%)^5}{(1 + 5\%) * (1 + 2\%) * (1 - 10\%) * (1 + 8\%)} - 1 = 11.36\%$$

$$= \frac{\$18.82}{(1 + 11.36\%)} = \$16.90$$

Friday opening price

C. A) and D) combined

D. Arithmetic average approach used to compute Friday return

24. The arithmetic average daily return for Dopey, Inc. was 2 percent for this past week. Dopey's stock was traded at \$23.70 when the market closed on Friday. The daily returns for Monday, Tuesday, Thursday, and Friday are 4.8%, 5.6%, -4.0%, and 12.2%, respectively. What was Dopey's opening price on Monday?

- A. \$21.47
- B. \$21.55
- C. \$21.75
- D. \$22.80

Answer: C Type: Calculation Level of Difficulty: Difficult LO: 8.2

Explanation:

A. Friday closing price/(1+AM)⁵

$$= 2\% \times 5 - 4.8\% - 5.6\% + 4.0\% - 12.2\% = -8.6\%$$

$$= \frac{\$23.70}{(1+12.2\%) * (1-4\%) * (1-8.6\%) * (1+5.6\%) * (1+4.8\%)} = \$21.75$$

Monday opening price

D. Monday closing price

25. What is the expected return on a stock that has a 15 percent probability of a 35 percent return, a 20 percent probability of a 25 percent return, a 50 percent probability of a 15 percent, and a probability of 15 percent of -20 percent?

- A. 18.75%
- B. 14.75%
- C. 13.75%
- D. 20.75%

Answer: B Type: Calculation Level of Difficulty: Easy LO: 8.1

Explanation:

$$E(R) = 15\% * 35\% + 20\% * 25\% + 50\% * 15\% + 15\% * (-20\%) = 14.75\%$$

B.

C. Negative return taken as positive return in the computation

D. Returns are equally likely, negative taken as positive in computation

26. What is the expected return from an investment that has an equally likely probability to lose or double half of the investment?

- A. 50%
- B. 75%
- C. -50%
- D. 200%

Answer: B Type: Calculation Level of Difficulty: Easy LO: 8.1

Explanation:

B. $E(r) = 0.5 \times -0.5 + 0.5 \times 2 = 75\%$

27. You have done a thorough study of the economy and of Stock X and concluded the following probabilities: of having a boom next year is 20 percent, of having a stable economy is 55 percent, and of having a recession is 25 percent. You have also found the price of Stock X will be: \$45 if there is a boom, \$25 if the economy is stable, and \$15 if there is a recession. What is the ex ante expected return on Stock X if it is currently selling for \$24?

- A. -9.43%
- B. 10.42%
- C. 18.06%
- D. 26.50%

Answer: B Type: Calculation Level of Difficulty: Medium LO: 8.1

Explanation:

A. Transpose P_0 with P_1 in the computation of $E(r)$

$$E(R) = \frac{\$26.5 - \$24}{\$24} = 10.42\%$$

The ex ante expected return,

28. Given the information in the following table, what is the expected return of the security?

State of the Economy	Probability of Occurrence	Expected Return
High Growth	10%	35%
Moderate Growth	25%	20%
No Growth	50%	10%
Recession	15%	-15%

- A. 11.25%
- B. 12.50%
- C. 15.75%
- D. 25.00%

Answer: A Type: Calculation Level of Difficulty: Easy LO: 8.1

Explanation:

A. $ER = 10\% \times 35\% + 25\% \times 20\% + 50\% \times 10\% + 15\% \times (-15\%) = 11.25\%$

- B. Simple average of the 4 returns
- C. Negative return taken as positive return in the computation
- D. Simple average of the 4 probabilities

29. If the closing price of Stock Y was \$38.63 on Friday, which was after it had earned daily returns of 8 percent, 23 percent, -30 percent, 20 percent, and -5 percent during the week (Monday to Friday), what was the opening price of Stock Y on Monday?

- A. \$17.47
- B. \$17.75
- C. \$33.00
- D. \$36.44

Answer: D Type: Calculation Level of Difficulty: Medium LO: 8.1

Explanation:

A. B and C combined

B. Negative returns taken as positive returns in the computation

$$= \frac{\$38.63}{(1+8\%)*(1+23%)*(1-30%)*(1+20%)*(1-5\%)} = \$36.44$$

D) Monday opening price

30. On January 1, you forecasted that there is a 45 percent chance that the stock price of the Edward Bear, Inc. will be \$95 in one year while there is a 55 percent chance that the stock price will be \$35. Six months later, you revised the estimated probability to 25 percent chance of the high state (stock price of \$95). If the market agrees with your revised forecasts, what is the expected change in stock price from January 1 to July 1? Assume the discount rate is zero.

- A. Price goes up by 19.35%
- B. Price goes down by 19.35%
- C. Price goes up by 24%
- D. Price goes down by 24%

Answer: B Type: Calculation Level of Difficulty: Medium LO: 8.1

Explanation:

B. The expected price on January 1, $P_0 = \$95*45\% + \$35*55\% = \$62$

The expected price on July 1, $P_1 = \$95*25\% + \$35*75\% = \$50$

Percentage change in price = $(\$50 - \$62)/\$62 = -19.35\%$

D. Percentage change in price = $(P_1 - P_0)/P_1$

Section 8.2 – Measuring Risk

31. Which of the following statements is TRUE?

- A. The more stable the possible returns, the greater the risk.
- B. Risk means the probability that the actual return from an investment is less than the expected return.
- C. The range is a more accurate measure of risk than the standard deviation, because the range uses the maximum and minimum values, whereas the standard deviation uses all the observations.
- D. Securities offering lower expected rates of return tend to be riskier.

Answer: B Type: Concept Level of Difficulty: Medium LO: 8.3

32. Which of the following statements is FALSE?

- A. Risk measures the volatility of the returns of the asset.
- B. Risk measures are concerned only with the negative performance of the asset.
- C. The Standard deviation is not the only measure of risk.
- D. Risk and return are inversely related

Answer: B Type: Concept Level of Difficulty: Medium LO: 8.3

33. You have observed the following annual returns for Motherboard, Inc: 25%, 15%, -20%, 30%, and -15%. What are the variance and standard deviation of returns?

A. Variance = 0.00425; standard deviation = 0.06519

B. Variance = 0.06519; standard deviation = 0.00425

C. Variance = 0.05325; standard deviation = 0.23076

D. Variance = 0.23076; standard deviation = 0.05325

Answer: C Type: Calculation Level of Difficulty: Easy LO: 8.3

Explanation:

A. Negative returns taken as positive returns in the computation

$$= \frac{25\% + 15\% - 20\% + 30\% - 15\%}{5} = 7\%$$

$$\sigma = \sqrt{\frac{\sum_{i=1}^5 (r_i - 7\%)^2}{5 - 1}} = \sqrt{0.05325} = 0.23076$$

D. Transpose of variance with standard deviation in C)

34. Calculate the standard deviation of a portfolio that has \$1,500 invested in Stock A and \$4,500 invested in stock B.

A. 59.38%

B. 17.76%%

C. 3.15%

D. 44.49%

Answer: B Type: Calculation Level of Difficulty: Medium LO: 8.3

Explanation:

A. Not including probabilities in the calculation

B. 17.01 by excel

C. Calculating variance instead of standard deviation

D. Taking a weighted average of both stocks standard deviations.

35. The closing prices for Stock B from December to June are: \$42.90, \$44.20, \$51.50, \$49.60, \$45.50, \$46.30, and \$42.50. What is the standard deviation of returns over the six-month period?

A. 0.2955%

B. 0.8683%

C. 5.4362%

D. 9.3181%

Answer: D Type: Calculation Level of Difficulty: Medium LO: 8.3

Explanation:

A. Variance of C)

B. Variance of D)

C. Negative returns taken as positive returns in the computation

D. Compute monthly returns:

3.0303%, 16.5158%, -3.6893%, -8.2661%, 1.7582%, -8.2073%

$$= \frac{3.0303\% + 16.5158\% - 3.6893\% - 8.2661\% + 1.7582\% - 8.2073\%}{6} = 0.1903\%$$

$$\sigma = \sqrt{\frac{\sum_{i=1}^6 (r_i - 0.1903\%)^2}{6-1}} = \sqrt{0.008683} = 9.3181\%$$

36. What is the standard deviation of returns on a stock priced today at \$10 that has a 25 percent probability of increasing to \$13, a 50 percent probability of increasing to \$12, a 15 percent probability of increasing by 5 percent, and a 10 percent probability decreasing to \$ 7?

- A. 0.0094
- B. 0.0286
- C. 0.0968
- D. 0.1692

Answer: D Type: Calculation Level of Difficulty: Difficult LO: 8.3

Explanation:

A. Deviation computed as (Probability*Return – E®), instead of (Return ®(R))

$$\sigma^2 = \sum_{i=1}^4 (\text{Prob}_i) (r_i - 15.25\%)^2 = 0.0286$$

- C. Standard deviation from A)
- D. Standard deviation from B)

37. Given the following forecasts, what is the standard deviation of returns?

State of the Economy	Probability of Occurrence	Expected Return
Expansion	25%	45%
Normal	60%	20%
Recession	15%	-15%

- A. 18.4120%
- B. 11.3908%
- C. 3.3900%
- D. 1.2975%

Answer: A Type: Calculation Level of Difficulty: Medium LO: 8.3

$$E(R) = 45\% * 25\% + 20\% * 60\% + (-15\%) * 15\% = 21\%$$

$$\sigma = \sqrt{\sum_{i=1}^3 (\text{Prob}_i)(r_i - 21\%)^2} = \sqrt{0.0339} = 18.4120\%$$

- B. Negative return taken as positive return in the computation
 C. Variance of A)
 D. Variance of B)

38. Given the following forecasts, what is the variance of returns?

State of the Economy	Probability of Occurrence	Expected Return
Expansion	25%	45%
Normal	60%	20%
Recession	15%	-15%

A. 18.4120%

B. 11.3908%

C. 3.3900%

D. 1.2975%

Answer: C Type: Calculation Level of Difficulty: Medium LO: 8.3

$$E(R) = 45\% * 25\% + 20\% * 60\% + (-15\%) * 15\% = 21\%$$

$$\sigma = \sqrt{\sum_{i=1}^3 (\text{Prob}_i)(r_i - 21\%)^2} = \sqrt{0.0339} = 18.4120\%$$

- B. Negative return taken as positive return in the computation
 C. Variance of A)
 D. Variance of B)

39. You have given the following forecasts for the economy and Stock A: (1) the probability of having a recession next year is 30 percent, a normal economy is 55 percent, and an expansion is 15 percent, and (2) the price of Stock A will be \$9 if the economy is in recession, \$15 if the economy is normal, and \$18 if the economy is in expansion. What is the ex ante standard deviation of Stock A's returns if it is currently selling for \$12?

A. 7.1719%

B. 26.7804%

C. 29.4219%

D. 54.2419%

Answer: B Type: Calculation Level of Difficulty: Difficult LO: 8.3

Explanation:

A. Variance of B)

B. Compute conditional returns in different states of economy: -25%, 25%, 50%

$$\sigma = \sqrt{\sum_{i=1}^3 (\text{Prob}_i)(r_i - 13.75\%)^2} = \sqrt{0.071719} = 26.7804\%$$

C. Variance of D)

D. (Deviation)² instead of (probability*deviation²) used in the computation

40. You have given the following forecasts for the economy and Stock A: (1) the probability of having a recession next year is 30 percent, a normal economy is 55 percent, and an expansion is 15 percent, and (2) the price of Stock A will be \$9 if the economy is in recession, \$15 if the economy is normal, and \$18 if the economy is in expansion. What is the ex ante variance of Stock A's returns if it is currently selling for \$12?

- A. 7.1719%
- B. 26.7804%
- C. 29.4219%
- D. 54.2419%

Answer: A Type: Calculation Level of Difficulty: Difficult LO: 8.3

Explanation:

A. Compute conditional returns in different states of economy: -25%, 25%, 50%

$$\sigma = \sqrt{\sum_{i=1}^3 (\text{Prob}_i)(r_i - 13.75\%)^2} = \sqrt{0.071719} = 26.7804\%$$

- B. Variance of A)
- C. Variance of D)
- D. (Deviation)² instead of (probability*deviation²) used in the computation

Section 8.3 – Expected return and risk for portfolios

41. Which of the following is a TRUE statement of modern portfolio theory?

- A. It states that securities should be managed within a portfolio, rather than individually, to lower risk-reduction gains.
- B. It stipulates that investors should diversify their investments so as to be unnecessarily exposed to a single negative event.
- C. It shows how to form portfolios with the highest possible expected rate of return for any given level of risk.
- D. It demonstrates that by combining securities into portfolios, we can increase risk.

Answer: C Type: Concept Level of Difficulty: Medium LO: 8.4

$$\rho_{AB}$$

42. Maximum benefits of diversification with two stocks occur when ρ_{AB} is:

- A. 0
- B. 1
- C. -1
- D. 0.52

Answer: C Type: Concept Level of Difficulty: Easy LO: 8.4

43. Stocks A and B have a correlation of +1. If stock A went from \$ 10 to \$12 over the last month, what is the price of stock B, if its price one month ago was \$ 5?

- A. \$5
- B. \$4
- C. \$6

D. Cannot be determined

Answer: C Type: Concept Level of Difficulty: Medium LO: 8.4

44. Use the following two statements to answer this question:

I. The expected return on a portfolio is the equally weighted average of the expected returns on the individual securities in the portfolio.

II. The standard deviation of a portfolio reflects the weighted impact of the individual securities' standard deviations and the relationship among the co-movements of the returns on those individual securities.

A. I is incorrect, II is correct.

B. I is correct, II is incorrect.

C. I and II are incorrect.

D. I and II are correct.

Answer: A Type: Concept Level of Difficulty: Medium LO: 8.4

45. Which of the following is a FALSE statement of the correlation coefficient?

A. It measures how security returns move in relation to one another.

B. Positive correlation coefficients imply that the returns on Security A tend to move in the same direction as those on security B.

C. Negative correlation coefficients imply that the returns on Security A tend to move in the opposite direction to those on security B.

D. The closer the absolute value of the correlation coefficient is to one, the weaker the relationship between the returns on the two securities.

Answer: D Type: Concept Level of Difficulty: Medium LO: 8.4

$$\rho_{AB} = \pm 1$$

I. When we know the return on Security A, we can predict the return on Security B with certainty.

II. Generally, security returns display positive correlations with one another but they are less than one, because all securities tend not to follow the movements of the overall market.

III. Any value of correlation less than +1 provides a possibility of diversification.

A. I is incorrect, II is correct, III is correct.

B. I is correct, II is incorrect, III is correct.

C. I and II are incorrect, is incorrect.

D. I and II are correct, is incorrect.

Answer: B Type: Concept Level of Difficulty: Medium LO: 8.4

$$\rho_{AB} < +1$$

$$\rho_{AB} = -1$$

II. As long as, an equally weighted portfolio would be risk free.

III. Diversification can never eliminate the total risk of the portfolio.

A. I is correct, II is incorrect, III is correct

B. I is incorrect, II is correct, III is correct.

C. I and II are correct, III is incorrect.

D. I, II and III are incorrect.

Answer: A Type: Concept Level of Difficulty: Medium LO: 8.4

48. Which of the following is NOT a correct statement?

A. Risk adverse investors like expected returns and dislike risk, and therefore require compensation to assume additional risk.

B. Efficient portfolios are those portfolios that offer the highest expected return for a given level of risk, or offer the lowest risk for a given expected return.

C. The minimum variance portfolio is a portfolio that lies on the efficient frontier and has the minimum amount of portfolio risk available from any possible combination of available securities.

D. Portfolios on the lower segment of the minimum variance frontier dominate portfolios that lie above the minimum variance portfolio on the upper segment.

Answer: D Type: Concept Level of Difficulty: Medium LO: 8.4

49. Which of the following is TRUE about diversification?

A. By diversifying, portfolio risk can be reduced to zero.

B. There is no benefit from diversification if the correlation coefficient is 1.

C. The variance is the weighted average of the individual securities' variances when the correlation is equal to -1.

D. If the covariance between two securities is negative, then the portfolio's standard deviation can be reduced to zero.

Answer: B Type: Concept Level of Difficulty: Medium LO: 8.4

50. What is the expected return for a portfolio that has \$800 invested in Stock A and \$1,200 invested in Stock B, if the expected returns on Stock A and Stock B are 10% and 18%, respectively?

A. 14.00%

B. 14.80%

C. 13.20%

D. 12.60%

Answer: B Type: Calculation Level of Difficulty: Easy LO: 8.4

Explanation:

$$= \frac{\$800}{\$800 + \$1,200} = 40\%$$

B. Portfolio weight in A, portfolio weight in B = $1 - 40\% = 60\%$

$E(R) = 10\% \cdot 40\% + 18\% \cdot 60\% = 14.80\%$

C. Crisscross portfolio weights and returns

The information below is used to answer the next three questions:

State of the Economy	Probability of Occurrence	Stock A Expected Return	Stock B Expected Return
Expansion	20%	25%	35%

Stable	50%	15%	25%
Recession	30%	-5%	-15%

51. Given the following forecasts, what is the expected return for a portfolio that has \$1,500 invested in Stock A and \$4,500 invested in Stock B?

- A. 12.0%
- B. 12.5%
- C. 14.0%
- D. 14.2%

Answer: C Type: Calculation Level of Difficulty: Medium LO: 8.4

Explanation:

A. Crisscross weights and returns in C)

$$= \frac{\$1,500}{\$1,500 + \$4,500} = 0.25$$

C. Portfolio weight in A, portfolio weight in B = $1 - 0.25 = 0.75$

$$E(R_A) = 25\% \cdot 20\% + 15\% \cdot 50\% + (-5\%) \cdot 30\% = 11\%$$

$$E(R_B) = 35\% \cdot 20\% + 25\% \cdot 50\% + (-15\%) \cdot 30\% = 15\%$$

$$E(R_P) = 11\% \cdot 0.25 + 15\% \cdot 0.75 = 14\%$$

D. Simple average of A and B's returns used as expected returns of A and B

52. Calculate the correlation between the two stocks.

- A. -0.99
- B. 0
- C. 0.99
- D. -1.00

Answer: C Type: Calculation Level of Difficulty: Difficult LO: 8.4

Explanation:

A. The negative value of actual correlation

$$COV = .2(.25 - .11)(.35 - .15) + .5(.15 - .11)(.25 - .15) + .3(-.05 - .11)(-.15 - .15) = 0.022$$

$$0.022 / (0.1114 \cdot 0.2) = 0.9874$$

- C.
- D. -1.00

53. Suppose you own 100 shares of CyberChase Corporation and 200 shares of NetSurfer Corporation. At the time of purchase, the stocks of CyberChase and NetSurfer were trading at \$25 and \$15 per share, respectively. What is the expected value of the portfolio if CyberChase has an expected return of 8 percent and NetSurfer has an expected return of 13 percent?

- A. \$6,065
- B. \$6,090
- C. \$7,095
- D. \$7,270

Answer: B Type: Calculation Level of Difficulty: Medium LO: 8.4

Explanation:

A. Crisscross costs and returns in B)

B. Expected value of the portfolio =

$$\$25 \times 100 \times (1.08) + \$15 \times 200 \times (1.13) = \$2,700 + \$3,390 = \$6,090$$

C. A) and C) combined

D. Crisscross share prices in B)

54. What is the expected return for a portfolio that has \$1,000 invested in Stock X, \$1,500 invested in Stock Y, and \$2,500 invested in Stock Z, if the expected returns on Stock X, Stock Y, and Stock Z are 10%, 12%, and 15%, respectively?

A. 11.90%

B. 12.00%

C. 12.50%

D. 13.10%

Answer: D Type: Calculation Level of Difficulty: Easy LO: 8.4

Explanation:

A. Crisscross portfolio weights and returns

B. Crisscross portfolio weights and returns

$$w_X = \frac{\$1,000}{\$1,000 + \$1,500 + \$2,500} = 0.2, w_Y = \frac{\$1,500}{\$5,000} = 0.3, w_Z = 1 - 0.2 - 0.3 = 0.5$$

D.

$$E(R_P) = 10\% \times 0.2 + 12\% \times 0.3 + 15\% \times 0.5 = 13.10\%$$

55. A portfolio consists of two securities: Nervy and Goofy. The expected return of Nervy is 12 percent with a standard deviation of 15 percent. The expected return of Goofy is 9 percent with a standard deviation of 10 percent. What is the portfolio standard deviation if 35 percent of the portfolio is in Nervy and the two securities have a correlation of 0.6?

A. 9.02%

B. 10.52%

C. 11.75%

D. 12.18%

Answer: B Type: Calculation Level of Difficulty: Easy LO: 8.4

$$\sigma_i^2 w_i^2$$

$$\sigma_P = \sqrt{(0.35^2)(0.15^2) + (0.65^2)(0.10^2) + 2(0.35)(0.65)(0.15)(0.10)(0.6)} = 10.52\%$$

$$\sigma_i \times w_i$$

$$w_i^2 \text{ and } \sigma_i^2$$

D. Crisscross

56. You are contemplating investing in two stocks ABC and XYZ that have an expected return of 12 percent and 9 percent respectively. If your target expected return is 10 percent, what would be the weight in ABC?

- A. 50%
- B. 0.33%
- C. 0.67%
- D. 100%

Answer: B Type: Calculation Level of Difficulty: Difficult LO: 8.4

Explanation:

$$B. 0.09(1-x) + 0.12x = 0.1; x = 0.33\%$$

Use the following information to answer the next four questions:

State of the Economy	Probability of Occurrence	Stock X Expected Return	Stock Y Expected Return	Stock Z Expected Return
Recession	35%	25%	-10%	15%
Average	45%	14%	8%	25%
Boom	20%	4%	14%	-10%

57. Given the following forecasts, what is the expected return for a portfolio that has \$2,200 invested in Stock X, \$3,600 in Stock Y, and \$4,200 invested in Stock Z?

- A. 10.62%
- B. 14.82%
- C. 30.50%
- D. 33.25%

Answer: A Type: Calculation Level of Difficulty: Medium LO: 8.4

Explanation:

$$A. E(R_X) = 25\% \cdot 35\% + 14\% \cdot 45\% + 4\% \cdot 20\% = 15.85\%$$

$$E(R_Y) = (-10\%) \cdot 35\% + 8\% \cdot 45\% + 14\% \cdot 20\% = 2.90\%$$

$$w_X = \frac{\$2,200}{\$2,200 + \$3,600 + \$4,200} = 0.22$$

$$w_Y = \frac{\$3,600}{\$10,000} = 0.36$$

$$w_Z = \frac{\$4,200}{\$10,000} = 0.42$$

$$E(R_P) = 15.85\% \cdot 0.22 + 2.90\% \cdot 0.36 + 14.5\% \cdot 0.42 = 10.62\%$$

- B. Negative returns taken as positive returns in the computation of E(R)s
- D. Sum of E(R)s of X, Y and Z

58. What is the correlation between stocks X and Y?

- A. 0.26
- B. -0.96
- C. 0.96
- D. 0.51

Answer: B Type: Calculation Level of Difficulty: Medium LO: 8.4

Explanation:

$$\sigma_X = \sqrt{\frac{1}{13} \sum_{i=1}^{13} (r_{X,i} - 15.85\%)^2} = 0.77; \sigma_Y = \sqrt{\frac{1}{13} \sum_{i=1}^{13} (r_{Y,i} - 2.90\%)^2} = 0.097$$

$$\text{cov} = \frac{1}{13} \sum_{i=1}^{13} (r_{X,i} - 15.85\%)(r_{Y,i} - 2.9\%) = -0.07473; \rho = \frac{-0.07473}{0.77 \times 0.097} = -0.96$$

59. What is the correlation between stocks X and Z?

- A. 0.96
- B. 0.51
- C. -0.26
- D. 0.26

Answer: B Type: Calculation Level of Difficulty: Medium LO: 8.4

Explanation:

$$\sigma_X = \sqrt{\frac{1}{13} \sum_{i=1}^{13} (r_{X,i} - 15.85\%)^2} = 0.77; \sigma_Z = \sqrt{\frac{1}{13} \sum_{i=1}^{13} (r_{Z,i} - 14.5\%)^2} = 0.13;$$

$$\text{cov} = \frac{1}{13} \sum_{i=1}^{13} (r_{X,i} - 15.85\%)(r_{Z,i} - 15.4\%) = 0.010185; \rho = \frac{0.010185}{0.77 \times 0.13} = 0.509175$$

60. What is the correlation between stocks Y and Z?

- A. 0.96
- B. 0.51
- C. -0.26
- D. 0.26

Answer: C Type: Calculation Level of Difficulty: Medium LO: 8.4

Explanation:

$$\sigma_X = \sqrt{13 \text{pr} \{Y_i - 2.9\}^2} = 0.097; \sigma_Z = \sqrt{13 \text{pr} \{Z_i - 14.5\}^2} = 0.13;$$

$$\text{cov} = \sqrt{13 \text{pr} \{Z_i - 14.5\} \{Y_i - 15.4\}} = -0.00657; \rho = -0.00657 / (0.097 * 0.13) = -0.25688$$

61. Suppose you own a portfolio that has 500 shares of SHC Company and 1,000 shares of MHC Company. The stock prices of SHC and MHC at the time of purchase were \$40 and \$25 per share, respectively. Given the following forecasts, what is the expected return for the portfolio?

State of the Economy	Probability of Occurrence	SHC Expected Return	MHC Expected Return
Boom	10%	30%	20%
Average	60%	15%	10%
Recession	30%	-10%	-5%

- A. 7.61%
- B. 7.89%
- C. 11.94%
- D. 12.56%

Answer: A Type: Calculation Level of Difficulty: Medium LO: 8.4

Explanation:

$$A. E(R_{SHC}) = 30\% * 10\% + 15\% * 60\% + (-10\%) * 30\% = 9\%$$

$$w_{SHC} = \frac{\$40 * 500}{\$40 * 500 + \$25 * 1,000} = \frac{\$20,000}{\$45,000} = 0.4444$$

$$w_{MHC} = 1 - 0.4444 = 0.5556$$

$$E(R_P) = 9\% * 0.4444 + 6.5\% * 0.5556 = 7.61\%$$

- B. Crisscross weights and returns in A)
- C. Negative returns taken as positive returns in the computation
- D. B) and C) combined

62. Given the following forecasts, what is the covariance of the returns on securities A and B?

State of the Economy	Probability of Occurrence	Stock A Expected Return	Stock B Expected Return
Boom	15%	24%	30%
Normal	55%	12%	18%

Recession	30%	-8%	-20%

A. 0.0209

B. 0.1447

C. 0.2348

D. 0.9871

Answer: A Type: Calculation Level of Difficulty: Medium LO: 8.4

Explanation:

A. $E(R_A) = 24\% \cdot 15\% + 12\% \cdot 55\% + (-8\%) \cdot 30\% = 7.8\%$

$$COV_{AB} = \sum_{i=1}^3 Prob_i (r_{Ai} - 7.8\%)(r_{Bi} - 8.4\%) = 0.005249 + 0.002218 + 0.013462 = 0.020928$$

B. Square root of (A)

D. Correlation between A and B

63. Given the following forecasts, what is the correlation between securities X and Y?

State of the Economy	Probability of Occurrence	Stock X Expected Return	Stock Y Expected Return
Boom	30%	20%	-15%
Normal	45%	12%	20%
Bust	25%	-6%	18%

A. -0.0098

B. 0.0098

C. -41.38

D. -0.6371

Answer: D Type: Calculation Level of Difficulty: Difficult LO: 8.4

Explanation:

A. COV_{XY} B. $-COV_{XY}$

C. cov/product of variances

D. $E(R_X) = 20\% \cdot 30\% + 12\% \cdot 45\% + (-6\%) \cdot 25\% = 9.9\%$

$$COV_{xy} = \sum_{i=1}^3 Pr_i (r_{xi} - 9.9\%)(r_{yi} - 9.0\%) = -.00727 + .00104 - .00358 = -.00981$$

$$\rho_{xy} = \frac{COV_{xy}}{\sigma_x \sigma_y} = \frac{-0.00981}{0.09787 \cdot 0.15732} = -0.6371$$

64. What is the covariance of the daily returns on Hocus and Pocus?

	Return of Hocus	Return of Pocus
Monday	5%	-4%
Tuesday	-3%	3%
Wednesday	6%	10%
Thursday	-10%	-5%
Friday	8%	7%

A. 0.0031

B. 0.0235

C. 0.0368

D. 0.0449

Answer: A Type: Calculation Level of Difficulty: Difficult LO: 8.4

$$\bar{r}_H = \frac{5\% - 3\% + 6\% - 10\% + 8\%}{5} = 1.2\%$$

$$\bar{r}_P = \frac{-4\% + 3\% + 10\% - 5\% + 7\%}{5} = 2.2\%$$

$$COV_{HP} = \frac{\sum_{i=1}^5 (r_{H,i} - 1.2\%)(r_{P,i} - 2.2\%)}{5 - 1} = \frac{-0.0024 - 0.0003 + 0.0037 + 0.0081 + 0.0033}{4} = 0.0031$$

65. You have observed the following quarterly returns for companies: Humpty and Dumpty:

	Humpty	Dumpty
1 st Quarter	15%	-6%
2 nd Quarter	-3%	8%
3 rd Quarter	-8%	10%
4 th Quarter	11%	4%

What is the correlation between the returns on the two companies?

A. -0.007

B. -0.333

C. -0.667

D. -0.894

Answer: D Type: Calculation Level of Difficulty: Difficult LO: 8.4

Explanation:

$$\bar{r}_H = \frac{15\% - 3\% - 8\% + 11\%}{4} = 3.75\%$$

D.

$$\bar{r}_D = \frac{-6\% + 8\% + 10\% + 4\%}{4} = 4\%$$

$$\sigma_H = \sqrt{\frac{\sum_{i=1}^4 (r_i - 3.75\%)^2}{4-1}} = \sqrt{\frac{0.0127 + 0.0046 + 0.0138 + 0.0053}{3}} = 0.11$$

$$\sigma_D = \sqrt{\frac{\sum_{i=1}^4 (r_i - 4\%)^2}{4-1}} = \sqrt{\frac{0.01 + 0.0016 + 0.0036 + 0}{3}} = 0.0712$$

$$COV_{HD} = \frac{\sum_{i=1}^4 (r_{Hi} - 3.75\%)(r_{Di} - 4\%)}{4-1} = \frac{-0.0113 - 0.0027 - 0.0071 - 0}{3} = -0.007$$

$$\rho_{HD} = \frac{COV_{HD}}{\sigma_H \sigma_D} = \frac{-0.007}{0.11 * 0.0712} = -0.894$$

66. The expected returns for Hickory, Inc. and Dickory, Inc. are 8 percent and 13 percent, respectively. The standard deviation is 12 percent for Hickory and 18 percent for Dickory. What is the portfolio standard deviation if 40 percent of the portfolio is in Hickory and there is no relationship between the returns on the two securities?

- A. 0.7108%
- B. 1.3968%
- C. 8.4309%
- D. 11.8186%

Answer: D Type: Calculation Level of Difficulty: Medium LO: 8.4

Explanation:

- A. Variance of C)
- B. Variance of D)

$$\sigma_P = \sqrt{(w_H^2)(\sigma_H^2) + (w_D^2)(\sigma_D^2)} = \sqrt{0.002304 + 0.011664} = \sqrt{0.013968} = 0.118186$$

D.

67. The expected returns for ABC Company and XYZ Company are 12 percent and 9 percent, respectively. The standard deviation is 20 percent for ABC and 15 percent for XYZ. What is the portfolio standard deviation if one-third of the portfolio is in ABC and the two securities have perfect positive correlation?

- A. 16.67%
- B. 10.00%
- C. 2.78%
- D. 1.00%

Answer: A Type: Calculation Level of Difficulty: Medium LO: 8.4

$$\sigma = \sqrt{(w_{ABC} * \sigma_{ABC} + w_{XYZ} * \sigma_{XYZ})^2} = \sqrt{(0.3333 * 0.20 + 0.6667 * 0.15)^2} = 16.67\%$$

A.

- B. Security return mistaken as standard deviation in the computation
 C. Variance of A)
 D. Variance of B)

68. The expected returns for Bumpy, Inc. and Bouncy, Inc. are 20 percent and 8 percent, respectively. The standard deviation is 35 percent for Bumpy and 16 percent for Bouncy. What is the portfolio standard deviation if 45 percent of the portfolio is in Bumpy and the two securities have perfect negative correlation?

- A. 4.60%
 B. 6.95%
 C. 0.21%
 D. 0.48%

Answer: B Type: Calculation Level of Difficulty: Medium LO: 8.4

Explanation:

$$\sigma = \sqrt{(w_{\text{Bumpy}} * \sigma_{\text{Bumpy}} - w_{\text{Bouncy}} * \sigma_{\text{Bouncy}})^2} = \sqrt{(0.45 * 0.35 - 0.55 * 0.16)^2} = 6.95\%$$

- B.
 C. Variance of A)
 D. Variance of B)

69. Suppose you plan to create a portfolio with two securities: Rolie and Polie. Rolie has an expected return of 6 percent with a standard deviation of 5 percent. Polie has an expected return of 18 percent with a standard deviation of 15 percent. The correlation between the returns of these two securities is perfectly negative. What percentage of your investment should be in Polie to make the portfolio risk free? What would be the expected return on the portfolio?

- A. Portfolio weight in Polie = 25%; expected return on the portfolio = 9.00%
 B. Portfolio weight in Polie = 40%; expected return on the portfolio = 10.80%
 C. Portfolio weight in Polie = 60%; expected return on the portfolio = 13.20%
 D. Portfolio weight in Polie = 75%; expected return on the portfolio = 15.00%

Answer: A Type: Calculation Level of Difficulty: Medium LO: 8.4

$$\text{Portfolio weight in Polie} = \frac{\sigma_{\text{Rolie}}}{\sigma_{\text{Rolie}} + \sigma_{\text{Polie}}} = \frac{0.05}{0.05 + 0.15} = 25\%$$

A.

Expected return on the portfolio = 6%*75% + 18%*25% = 9%

70. Suppose you own a two-security portfolio. You have 25 percent of your funds invested in Security A and the balance of your funds invested in Security B. Security A has a standard deviation of 8 percent and Security B has a standard deviation of 12 percent. What is the covariance of the returns on Securities A and B if the portfolio standard deviation is 10 percent?

- A. 0.0040
 B. 0.0093
 C. 0.0147
 D. 0.0258

Answer: A Type: Calculation Level of Difficulty: Easy LO: 8.4

Explanation:

$$COV_{AB} = \frac{\sigma^2 - (w_A^2)(\sigma_A^2) - (w_B^2)(\sigma_B^2)}{2(w_A)(w_B)} = \frac{0.01 - 0.0004 - 0.0081}{0.375} = 0.004$$

A.

C. Crisscross weights and standard deviations of securities

71. Suppose you own a two-security portfolio. You have 35 percent of your money invested in Security X and the remainder in Security Y. The standard deviations of Securities X and Y are 10 percent and 15 percent. What is the correlation between the two securities if the portfolio variance is 0.013225?

A. 0.0055

B. 0.0137

C. 0.3654

D. 0.9148

Answer: C Type: Calculation Level of Difficulty: Medium LO: 8.4

Explanation:

A. Covariance of the portfolio

$$\rho_{XY} = \frac{\sigma_P^2 - (w_X^2)(\sigma_X^2) - (w_Y^2)(\sigma_Y^2)}{2(w_X)(w_Y)(\sigma_X)(\sigma_Y)} = \frac{0.013225 - 0.001225 - 0.00950625}{0.006825} = 0.3654$$

C.

D. Crisscross portfolio weights and standard deviations of the securities in the computation

72. The expected return on Alpha, Inc. is 8 percent and the expected return on Beta, Inc. is 24 percent. What is the trade-off between investing in Alpha and Beta if the portfolio weight in Alpha is increased by 1%?

A. -0.08%

B. -0.16%

C. -0.24%

D. -0.32%

Answer: B Type: Calculation Level of Difficulty: Medium LO: 8.4

$$= \frac{8\% - 24\%}{100} = -0.16\%$$

B. Trade-off

73. Indiana Jones intends to form a portfolio with two securities: Virtual and Real. Virtual has an expected return of 25 percent with a standard deviation of 5 percent. Real has an expected return of 12 percent with a standard deviation of 16 percent. The correlation between the two securities is 0.2. What is the portfolio standard deviation if the portfolio has an expected return of 20 percent?

A. 0.55%

B. 1.08%

C. 7.41%

D. 10.40%

Answer: C Type: Calculation Level of Difficulty: Medium LO: 8.4

Explanation:

A. Variance of C)

$$w_Y = \frac{ER_P - ER_R}{ER_Y - ER_R} = \frac{20\% - 12\%}{25\% - 12\%} = 0.6154$$

C. Portfolio weight in Virtual,

$$\sigma_P = \sqrt{(w_Y^2)(\sigma_R^2) + (w_V^2)(\sigma_R^2) + 2(w_Y)(w_R)(\sigma_Y)(\sigma_R)(\rho_{YR})}$$

$$= \sqrt{0.00095 + 0.00379 + 0.000757} = 7.41\%$$

D. Crisscross portfolio weights and standard deviation of securities in the computation

74. Cinderella plans to form a portfolio with two securities: Jaq and Gus. The correlation between the two securities is -1 . Given the following forecasts, what are the weights in Jaq and Gus that will set the standard deviation of the portfolio equal to zero?

State of the Economy	Probability of Occurrence	Jaq Expected Return	Gus Expected Return
High Growth	15%	25%	-10%
Moderate Growth	30%	13%	8%
Recession	55%	-5%	12%

A. Portfolio weights in Jaq and Gus are 74.37% and 25.63%, respectively

B. Portfolio weights in Jaq and Gus are 25.63% and 74.37%, respectively

C. Portfolio weights in Jaq and Gus are 60.51% and 39.49%, respectively

D. Portfolio weights in Jaq and Gus are 39.49% and 60.51% respectively

Answer: C Type: Calculation Level of Difficulty: Difficult LO: 8.4

Explanation:

A. Negative returns taken as positive returns in the computations

B. Weights in A reversed

C. Expected return on Jaq, $E(R_J) = 25\% \cdot 15\% + 13\% \cdot 30\% + (-5\%) \cdot 55\% = 4.9\%$

$$\sigma_G = \sqrt{\sum_{i=1}^3 \text{Pr}_i (r_i - 7.5\%)^2} = \sqrt{0.00459375 + 0.00000075 + 0.0011375} = 7.5598\%$$

$$w_J = \frac{\sigma_G}{\sigma_G + \sigma_J} = \frac{11.584\%}{11.584\% + 7.5598\%} = 60.51\%$$

The portfolio weight in Gus is $1 - \text{weight in Jaq} = 39.49\%$

D. Weights in C reversed

75. Suppose you observed the following data on two securities: Mars and Venus:

	Mars	Venus
Expected Return	6%	20%
Standard Deviation	8%	35%

You short sold 200 shares of Mars at \$20 per share and purchased 400 shares of Venus at \$25 per share to increase the possible return on the portfolio. The correlation between the securities is 0.30. What is the standard deviation of the portfolio?

- A. 7.06%
- B. 26.56%
- C. 32.45%
- D. 56.96%

Answer: D Type: Calculation Level of Difficulty: Difficult LO: 8.4

Explanation:

A. Variance of B)

B. Short selling of Mars shares taken as purchase of Mars shares

$$w_M = \frac{-200 * \$20}{-200 * \$20 + 400 * \$25} = \frac{-\$4,000}{\$6,000} = -0.6667$$

$$w_V = 1 - (-0.6667) = 1.6667$$

$$\begin{aligned}\sigma_P &= \sqrt{(w_M^2)(\sigma_M^2) + (w_V^2)(\sigma_V^2) + 2(w_M)(w_V)(\sigma_M)(\sigma_V)(\rho_{MV})} \\ &= \sqrt{0.002844 + 0.340278 - 0.018667} = 56.96\%\end{aligned}$$

76. A portfolio consists of three securities: Treachery (T), Sleazy (S), and Felony (F). The expected returns for Treachery, Sleazy, and Felony are 10 percent, 8 percent, and 16 percent, respectively. The standard deviation is 15 percent for Treachery, 20 percent for Sleazy, and 25 percent for Felony. The covariance of the returns on the three securities is: COVTS = 0.0144, COVTF = 0.0084, and COVSF = 0.03. What is the portfolio standard deviation if 20 percent of the portfolio is in Treachery and 35 percent is in Sleazy?

- A. 17.73%
- B. 13.91%
- C. 3.14%
- D. 1.93%

Answer: A Type: Calculation Level of Difficulty: Difficult LO: 8.4

$$\sigma_P = \sqrt{(w_T^2)(\sigma_T^2) + (w_S^2)(\sigma_S^2) + (w_F^2)(\sigma_F^2) + 2w_Tw_SCOV_{TS} + 2w_Tw_FCOV_{TF} + 2w_Sw_FCOV_{SF}}$$

$$\sigma_P = \sqrt{0.0009 + 0.0049 + 0.012656 + 0.002016 + 0.001512 + 0.009450} = 17.73\%$$

- B. Security returns mistaken as standard deviations in the computation
- C. Variance of A)

D. Variance of B)

77. Suppose you plan to create a portfolio with three securities: Dizzy (D), Lazy (L), and Crazy (C). The expected returns for Dizzy, Lazy and Crazy are 6 percent, 8 percent, and 10 percent, respectively. The standard deviation is 9 percent for Dizzy, 15 percent for Lazy, and 12 percent for Crazy. The correlation coefficients among the returns for the three securities are: $CORR_{DL} = 0.6$, $CORR_{DC} = -0.3$, and $CORR_{LC} = 0.4$. What is the portfolio standard deviation if 30 percent of the portfolio is in Dizzy and 40 percent is in Lazy?

- A. 0.34%
- B. 0.87%
- C. 5.82%
- D. 9.33%

Answer: D Type: Calculation Level of Difficulty: Difficult LO: 8.4

Explanation:

- A. Variance of C)
- B. Variance of D)

$$\sigma_P = \sqrt{w_D^2 \sigma_D^2 + w_L^2 \sigma_L^2 + w_C^2 \sigma_C^2 + 2w_D w_L \sigma_D \sigma_L \rho_{DL} + 2w_D w_C \sigma_D \sigma_C \rho_{DC} + 2w_L w_C \sigma_L \sigma_C \rho_{LC}}$$

$$= \sqrt{0.000729 + 0.0036 + 0.001296 + 0.001944 - 0.000583 + 0.001728} = 9.33\%$$

D.

Section 8.4 – The efficient frontier

78. The efficient frontier is constructed by:

- A. Maximizing expected portfolio return while holding portfolio variance constant.
- B. Minimizing portfolio variance while holding expected portfolio return constant.
- C. Either A or B
- D. None of the above will generate an efficient frontier.

Answer: C Type: Concept Level of Difficulty: Medium LO: 8.5

79. For the following efficient frontier, the standard-deviation of the minimum variance portfolio is:

- A. <2.5%
- B. Between 2.5% and 3.5%
- C. Between 3.5% and 4.5%
- D. 5.0%

Answer: B Type: Definition Level of Difficulty: Easy LO: 8.5

80. For the following efficient frontier, the expected return of the minimum variance portfolio is:

Explanation:

- A. <3.0%

- B. Between 3.0% and 4.0%
- C. Between 4.0% and 5.0%
- D. >5.0%

Answer: B Type: Concept Level of Difficulty: Easy LO: 8.5

81. The standard deviation and expected returns for 4 portfolios (A, B, C, and D) are graphed on the following efficient frontier:

Which of the following portfolios are attainable?

- A. A and B only
- B. B and D only
- C. B, A and D only
- D. All are attainable

Answer: A Type: Concept Level of Difficulty: Medium LO: 8.5

82. Which portfolio represents the minimum variance portfolio?

- A. B
- B. C
- C. A
- D. D

Answer: C Type: Concept Level of Difficulty: Medium LO: 8.5

83. The standard deviation and expected returns for 4 portfolios (A, B, C, and D) are graphed on the following efficient frontier:

Which of the following portfolios are efficient?

- A. A and C only
- B. B and D only
- C. B only
- D. All are efficient

Answer: C Type: Concept Level of Difficulty: Medium LO: 8.5

84. The standard deviation and expected returns for 4 portfolios (A, B, C, and D) are graphed on the following efficient frontier:

Which of the following portfolios are inefficient?

- A. A and D only
- B. B and C only

- C. C and D only
- D. All are inefficient

Answer: A Type: Concept Level of Difficulty: Medium LO: 8.5

85. Which of the following statements is FALSE?

- A. All portfolios on the efficient frontier are attainable.
- B. Every portfolio below the efficient portfolio can be improved.
- C. All portfolios on the efficient frontier have the same variance to return ratio.
- D. The minimum variance portfolio represents the lowest level of variance that an efficient portfolio can have.

Answer: C Type: Concept Level of Difficulty: Medium LO: 8.5

Section 8.5 – Diversification

86. Unsystematic risk is also called:

- A. market risk
- B. unique risk
- C. total risk
- D. any of the above

Answer: A Type: Definition Level of Difficulty: Easy LO: 8.6

87. If a company's stock price decreases due to the poor sales in one of its product lines, this is an example of:

- A. systematic risk
- B. total risk
- C. market risk
- D. unsystematic risk

Answer: D Type: Concept Level of Difficulty: Easy LO: 8.6

88. Which of the following is TRUE?

- A. Large numbers of securities are required to achieve diversification.
- B. Portfolio risk can always be reduced by adding additional securities.
- C. Systematic risk can never be eliminated.
- D. Unsystematic risk can never be reduced.

Answer: C Type: Concept Level of Difficulty: Medium LO: 8.6

89. Which one of the following is NOT an example of systematic risk?

- A. Jump in oil prices to new highs.
- B. Central bank decides to increase interest rates.
- C. Recall of a newly released product
- D. New regulations on industry subsidies.

Answer: C Type: Concept Level of Difficulty: Medium LO: 8.6

Practice Problems

90. Define the term "risk" and explain how it is related to the expected return.

Type: Definition Level of Difficulty: Medium LO: 8.1

Suggested answer:

Risk is the probability that the actual return from an investment is less than the expected return. The more variable the possible returns, the greater the risk.

91. Discuss the difference between expected returns using subjective probabilities and expected returns based on historical values.

Type: Concept Level of Difficulty: Medium LO: 8.1

Suggested answer:

Historical expected returns assume that, on average, the return of the next period will be similar to the past. On the other hand, subjective probabilities incorporate the actual information about the state of the stock to predict the future returns.

92. Distinguish between systematic and non-systematic risk.

Type: Definition Level of Difficulty: Medium LO: 8.3

Suggested answer:

Systematic risk, also called market risk, refers to how all securities in a portfolio tend to be directly related to overall movements in the general market or economy, so diversification cannot eliminate this risk.

Non-systematic risk, also called unique risk, is the part of the total risk that is company specific. This risk can be diversified away.

93. What are the components of total return and total risk?

Type: Definition Level of Difficulty: Easy LO: 8.3

Suggested answer:

Total return equals the income yield plus the capital gain (or loss) yield on the security.

Total risk can be viewed as the sum of market (systematic) risk and unique (non-systematic) risk.

94. Define and discuss expected return with regard to individual securities and a portfolio as a whole.

Type: Concept Level of Difficulty: Easy LO: 8.1

Suggested answer:

The expected return of an individual security is the weighted average of the most likely returns under various future scenarios, where the weights correspond to the probabilities of each scenario actually occurring.

The expected return on a portfolio is the weighted average of the expected returns on the individual securities in the portfolio, where each security's return is weighted by the security's value as a percentage of the overall portfolio.

95. Does diversification always reduce the overall risk?

Type: Concept Level of Difficulty: Medium LO: 8.3

Suggested answer:

As long as the individual securities are not perfectly positively correlated, portfolio risk is always less than a weighted average of the risk of the individual securities. Therefore, there are benefits of diversifying. The only case in which there are no risk-reduction benefits to be obtained from diversification is when the correlation coefficient is +1.0; in this case the portfolio standard deviation is simply the weighted average of the standard deviations of the individual securities.

96. Discuss the validity of the following statement: “diversification benefits decreased because correlation between stocks increased”

Type: Concept Level of Difficulty: Difficult LO: 8.6

Suggested answer:

Diversification benefits come from the low correlation between stocks. As the number of stocks in the market with a high correlation increases, the benefit from holding a portfolio that includes different stocks to decrease risk exposure decreases. So, this statement is true.

97. Suppose you are given the following information on The Doc & Company:

Year	Opening Price	Dividend	Closing Price
2006	\$53.48	\$5.00	\$54.90
2007	\$54.90	\$5.50	\$63.12
2008	\$63.12	\$6.00	\$41.34
2009	\$41.34	\$6.50	\$47.24
2010	\$47.24	\$7.00	\$49.69

A. Calculate the total annual returns for each one of the five years

B. Calculate the arithmetic average annual return

C. Calculate the geometric average annual return

D. Calculate the variance of annual returns

E. Calculate the standard deviation of annual returns

Type: Calculation Level of Difficulty: Medium

LO: 8.1, 8.2, 8.3

Suggested answer:

A. The total annual returns for each one of the five years:

Year	Annual return
2006	$\frac{\$5 + \$54.9}{\$53.48} - 1 = 12\%$
2007	$\frac{\$5.5 + \$63.12}{\$54.90} - 1 = 25\%$
2008	$\frac{\$6 + \$41.34}{\$63.12} - 1 = -25\%$
2009	$\frac{\$6.5 + \$47.24}{\$41.34} - 1 = 30\%$

201 0	$\frac{\$7 + \$49.69}{\$47.24} - 1 = 20\%$

$$= \frac{12\% + 25\% - 25\% + 30\% + 20\%}{5} = 12.4\%$$

$$= [(1 + 12\%)(1 + 25\%)(1 - 25\%)(1 + 30\%)(1 + 20\%)]^{1/5} - 1 = 10.37\%$$

$$\sigma^2 = \frac{\sum_{i=1}^5 (r_i - 12.4\%)^2}{5 - 1} = \frac{0.192486}{4} = 0.048122$$

$$\sigma = \sqrt{0.048122} = 0.2194$$

E. The standard deviation of returns,

98. Suppose you are given the following forecasts for the economy and the Sneezy Company at the beginning of the year:

State of the Economy	Probability of Occurrence	Expected Return
Expansion	20%	20%
Normal	60%	12%
Recession	20%	-10%

During the year, you observed the following:

Quarter	Opening Price	Dividend	Closing Price
January - March	\$14.72	\$0.50	\$15.32
April - June	\$15.32	\$0.50	\$16.50
July - September	\$16.50	\$0.50	\$16.18
October - December	\$16.18	\$0.50	\$16.76

- Calculate the ex-ante expected return
- Calculate the ex-ante standard deviation of returns
- Calculate the ex-post average return
- Calculate the ex-post standard deviation of returns

Type: Calculation Level of Difficulty: Medium LO: 8.1, 8.2, 8.3

Suggested answer:

- The ex-ante expected return = $20\% \cdot 20\% + 12\% \cdot 60\% + (-10\%) \cdot 20\% = 9.2\%$
- The ex-ante standard deviation of returns

$$\sigma = \sqrt{\sum_{i=1}^3 \text{Pr}_i (r_i - 9.2\%)^2} = \sqrt{0.002333 + 0.0047 + 0.007373} = 10.0876\%$$

$$\begin{aligned} \text{1st quarter return} &= \frac{\$0.5 + \$15.32}{\$14.72} = 7.473\%, & \text{2nd quarter return} &= \frac{\$0.5 + \$16.5}{\$15.32} = 10.966\%, \\ \text{3rd quarter return} &= \frac{\$0.5 + \$16.18}{\$16.5} = 1.091\%, & \text{4th quarter return} &= \frac{\$0.5 + \$16.76}{\$16.18} = 6.675\% \end{aligned}$$

$$= \frac{7.473\% + 10.966\% + 1.091\% + 6.675\%}{4} = 6.55\%$$

The ex-post average return

$$= \sqrt{\frac{\sum_{i=1}^4 (r_i - 6.55\%)^2}{4-1}} = \sqrt{\frac{0.000085 + 0.001949 + 0.002981 + 0.000002}{3}} = 4.0894\%$$

99. Suppose you have \$20,000 to invest in two securities: Spot and Dot. After you have done an extensive analysis of the economy and the two securities, you have the following forecasts:

State of the Economy	Probability of Occurrence	Spot Expected Return	Dot Expected Return
Boom	15%	-6%	35%
Normal	60%	12%	20%
Bust	25%	18%	-10%

- What are the expected returns on Spot and Dot?
- What are the standard deviations of the returns on Spot and Dot?
- What is the covariance of the returns on Spot and Dot?
- What is the correlation between Spot and Dot?
- What is the composition of the portfolio if you wish to have an expected return of 12 percent on the portfolio?
- What is the standard deviation of the portfolio?

Type: Calculation Level of Difficulty: Medium LO: 8.1, 8.2, 8.3, 8.4

Suggested answer:

A. Expected return on Spot = $-6\% \times 15\% + 12\% \times 60\% + 18\% \times 25\% = 10.8\%$

$$\sigma_S = \sqrt{\sum_{i=1}^3 \text{Pr}_i (r_i - 10.8\%)^2} = \sqrt{0.004234 + 0.000086 + 0.001296} = 7.49\%$$

$$\sigma_D = \sqrt{\sum_{i=1}^3 \text{Pr}_i (r_i - 14.75\%)^2} = \sqrt{0.006151 + 0.001654 + 0.015314} = 15.20\%$$

Dot's standard deviation,

$$COV_{SD} = \sum_{i=1}^3 Pr_i (r_{S,i} - 10.8\%) (r_{D,i} - 14.75\%) = -.0051 + .000378 - .00446 = -0.00918$$

$$\rho_{SD} = \frac{COV_{SD}}{\sigma_S \sigma_D} = \frac{-0.00918}{0.07494 * 0.152049} = -0.80565$$

$$w_S = \frac{ER_P - ER_D}{ER_S - ER_D} = \frac{12\% - 14.75\%}{10.8\% - 14.75\%} = 69.62\%$$

E. Portfolio weight in Spot,

Portfolio weight in Dot, $w_D = 1 - 69.62\% = 30.38\%$

$$\sigma_P = \sqrt{w_S^2 \sigma_S^2 + w_D^2 \sigma_D^2 + 2w_S w_D COV_{SD}} = \sqrt{0.002722 + 0.002134 - 0.003883} = 3.1186\%$$

100. Christopher Robin purchased 500 shares of Pooh, Inc. at \$48 per share and 1,000 shares of Piglet, Inc. at \$35 per share one year ago. Pooh and Piglet paid quarterly dividends of \$0.80 and \$0.50 per share, respectively, during the year. One year later, he sold both securities at \$45 per share. The two securities have a correlation of 0.6, and the standard deviations of Pooh and Piglet are 15 percent and 12 percent, respectively.

A. What fraction of Christopher Robin's portfolio is invested in Pooh? What fraction is invested in Piglet?

B. What are the income yields of Pooh, Piglet, and the portfolio?

C. What are the capital gain yields of Pooh, Piglet, and the portfolio?

D. What are the total return of Pooh, Piglet, and the portfolio?

E. What is the standard deviation of the portfolio?

Type: Calculation Level of Difficulty: Medium LO: 8.1, 8.2, 8.3, 8.4

Suggested answer:

A. Total amount invested = $500 * 48 + 1000 * 35 = \$59,000$

Fraction invested in Pooh (weight in Pooh) = $500 * 48 / 59000 = 40.678\%$

$$IY_{Pooh} = \frac{\$0.8 * 4}{\$48} = 6.67\%$$

$$IY_{Piglet} = \frac{\$0.5 * 4}{\$35} = 5.71\%$$

$$IY_P = \frac{\$0.8 * 4 * 500 + \$0.5 * 4 * 1,000}{\$48 * 500 + \$35 * 1,000} = \frac{\$3,600}{\$59,000} = 6.1\%$$

$$CGY_{Pooh} = \frac{\$45 - \$48}{\$48} = -6.25\%$$

$$CGY_{Piglet} = \frac{\$45 - \$35}{\$35} = 28.57\%$$

$$CGY_P = \frac{\$45 * 500 + \$45 * 1,000 - \$59,000}{\$59,000} = 14.41\%$$

The capital gain yield of the portfolio,

D. The total return on Pooh = 6.67% - 6.25% = 0.42%

The total return on Piglet = 5.71% + 28.57% = 34.28%

The total return on the portfolio = 6.1% + 14.41% = 20.51%. Alternatively we can calculate this

$$w_{pooh} 0.42\% + w_{piglet} * 34.28\% = 20.51\%$$

E. The standard deviation of the portfolio,

$$\begin{aligned}\sigma_P &= \sqrt{w_{Pooh}^2 \sigma_{Pooh}^2 + w_{Piglet}^2 \sigma_{Piglet}^2 + 2w_{Pooh}w_{Piglet}\sigma_{Pooh}\sigma_{Piglet}\rho_{PoohPiglet}} \\ &= \sqrt{0.003723 + 0.005068 + 0.005212} = 11.8334\%\end{aligned}$$

101. Suppose you plan to create a portfolio with two securities: Tobin and Bino, with weights to be greater than or equal to zero. The expected return of Tobin is 10 percent with a standard deviation of 12 percent. The expected return of Bino is 16 percent with a standard deviation of 20 percent. The correlation between the two securities is 0.30.

A. What percentage of your investment should be invested in Tobin to obtain a portfolio standard deviation of 12.2638 percent?

B. What is the expected return of the portfolio?

Type: Calculation Level of Difficulty: Difficult

LO: 8.1, 8.2, 8.3, 8.4

Suggested answer:

$$\begin{aligned}0.122638 &= \sqrt{w_T^2 \sigma_T^2 + (1 - w_T)^2 \sigma_B^2 + 2w_T(1 - w_T)\sigma_T\sigma_B\rho_{TB}} \\ 0.01504 &= 0.0144w_T^2 + 0.04 - 0.08w_T + 0.04w_T^2 + 0.0144w_T + 0.0144w_T^2 \\ 0.01504 &= 0.04w_T^2 - 0.0656w_T + 0.04 \\ 0 &= 0.04w_T^2 - 0.0656w_T + 0.02496 \\ w_T &= \frac{-(-0.0656) \pm \sqrt{(-0.0656)^2 - 4(0.04)(0.02496)}}{2(0.04)} = \frac{0.0656 \pm 0.0176}{0.08} \\ w_T &= 1.04 \text{ or } 0.60\end{aligned}$$

The portfolio weight in Tobin should be 60%. If Tobin's portfolio weight were 1.04, Bino's portfolio weight would have to be -.04, which violates the requirement that "...weights to be greater than or equal to zero."

B. Portfolio's expected return = 0.6*10% + 0.4*16% = 12.4%

102. The standard deviation and expected returns for 4 portfolios (A, B, C, and D) are graphed on the following efficient frontier:

Which of the following portfolios (or combinations) are likely to be preferred by a risk-averse investor? Which of the following portfolios (or combinations) are likely to be preferred by a risk-loving investor? Explain your reasoning.

Type: Concept Level of Difficulty: Difficult LO: 8.6

Suggested answer:

Regardless of the risk-preferences of the investor, she will only be interested in portfolios B and C. A is inefficient and D is unattainable.

The risk adverse investor will tend to prefer less risk so is more likely to choose C; while the risk loving investor is willing to take more risk to get more return so is more likely to choose B.

Unauthorized

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Chapter 9: The Capital Asset Pricing Model (CAPM)

Multiple Choice Questions

Section 9.1 The New Efficient Frontier

1. Use the following two statements to answer this question:

- I. The risk premium is the expected payoff needed to get out of a risky situation.
- II. The insurance premium is the payment needed to get into a risky situation.
- III. Risk averse investors willingly take fair gambles.

- A. I, II and III are correct.
- B. I, II and III are incorrect.
- C. I, II are correct, and II is incorrect.
- D. I, II are incorrect, III is correct.

Answer: B Type: Definition Difficulty: Easy LO: 9.1

2. Which of the following is **NOT** a correct statement?

- A. Risk averse investors will not willingly undertake fair gambles.
- B. Risk averse investors prefer to gamble on a risky situation where there is an equal probability of winning or losing the same amount of money.
- C. Risk averse investors require a risk premium to bear risk; the more risk averse they are, the higher the risk premium they require.
- D. Risk averse investors are willing to pay an insurance premium to get out of a risky situation.

Answer: B Type: Concept Difficulty: Medium LO: 9.1

3. Which one of the following is NOT true?

- A. Insurance premiums change with the level of risk aversion of the investor.
- B. Risk premiums change with the level of risk aversion of the investor.
- C. All investors are sitting at the same point on the efficient frontier.
- D. T-bills represent the lowest level of return that an investor expects to get.

Answer: C Type: Concept Difficulty: Medium LO: 9.1

4. Which of the following is a **TRUE** statement?

- A. The tangent portfolio is the risky portfolio on the efficient frontier whose tangent line cuts the horizontal axis at the risk-free rate.
- B. The new (or super) efficient frontier represents the portfolios composed of the risk-free rate and the tangent portfolio that offers the highest expected rate of return for any given level or risk.
- C. Separation theorem states that the investment decision, (how to construct the portfolio of risky assets), is not separate from the financing decision, (how much should be invested or borrowed in the risk-free asset).
- D. The market portfolio is a portfolio that contains some risky securities in the market.

Answer: B Type: Concept Difficulty: Medium LO: 9.1

5. Which of the following investments would a risk averse investor prefer if the risk free rate is zero?

Investment	Cost Today	Value of Investment if:	
		Market Return > 0% Probability: 40%	Market Return < 0% Probability: 60%
I	\$20	\$20	\$20
II	\$15	\$30	\$0
III	\$0	-\$10	\$10

- A. I only
B. II only
C. III only
D. I and III only

Answer: C

Type: Concept

Difficulty: Medium

LO: 9.1

Explanation:

- A. Arbitrary
B. Arbitrary
C.

Investment	E(Value)	E(Payoff)
I	$\$20 \cdot 40\% + \$20 \cdot 60\% = \$20$	$\$20 - \$20 = \$0$
II	$\$30 \cdot 40\% + \$0 \cdot 60\% = \$12$	$\$12 - \$15 = -\$3$
III	$-\$10 \cdot 40\% + \$10 \cdot 60\% = \$2$	$\$2 - \$0 = \$2$

A risk averse investor prefers investment III because to be induced to enter a risky situation, (s)he needs a risk premium.

- D. Arbitrary

6. What is the expected value from an investment that is equally likely to move from \$100 to \$180 or \$100 to \$70?

- A. \$ 140
B. \$ 115
C. \$ 85
D. \$ 125

Answer: D

Type: Calculation

Difficulty: Medium

LO: 9.1

Explanation:

- A. $100 + (180 - 100) \cdot 0.5 = 140$
B. $100 + (100 - 70) \cdot 0.5 = 115$
C. $100 + (70 - 100) \cdot 0.5 = 85$
D. $100 + 0.5 \cdot (180 - 100) + 0.5 \cdot (70 - 100) = 125$

7. What is the expected payoff from an investment that is equally likely to move from \$100 to \$180 or \$100 to \$70?

A. 40
B. 15
C. -15
D. 25

Answer: D Type: Calculation Difficulty: Medium LO: 9.1

Explanation:

A. $(180-100)*0.5=40$
B. $(100-70)*0.5=15$
C. $(70-100)*0.5=-15$
D. $0.5*(180-100)+0.5(70-100)=25$

8. A risk averse investor has an opportunity to invest in the following securities: Security A costs \$10 today and will have a value \$25 if the market goes up and \$0 if the market goes down; Security B costs \$8 today and will have a value of \$12 if the market goes up and \$6 if the market goes down; and Security C costs \$5 today and will have a value of \$20 if the market goes up and -\$20 if the market goes down. If there is a 40 percent chance that the market will go up and the risk free rate is zero, which security(ies) will the investor prefer?

A. A only
B. B only
C. C only
D. A and B only

Answer: B Type: Concept Difficulty: Medium LO: 9.1

Explanation:

A. Arbitrary
B.

Investment	E(Value)	E(Payoff)
A	$\$25*40\% + \$0*60\% = \$10$	$\$10 - \$10 = \$0$
B	$\$12*40\% + \$6*60\% = \$8.4$	$\$8.4 - \$8 = \$0.4$
C	$\$20*40\% - \$20*60\% = -\$4$	$-\$4 - \$5 = -\$9$

A risk averse investor prefers investment B because to be induced to enter a risky situation, (s)he needs a risk premium.

C. Arbitrary
D. Arbitrary

9. Given the following information, which investment(s) would risk averse investors prefer if the risk free rate is 5 percent?

Investment	Cost Today	Value of Investment after one year if:	
		Market Return > 0% Probability: 40%	Market Return < 0% Probability: 60%
I	\$18	\$36	\$8
II	\$14	\$12	\$16
III	\$15	\$30	\$5

- A. I only
B. II only
C. III only
D. I and II only

Answer: A

Type: Concept

Difficulty: Difficult

LO: 9.1

Explanation:

A.

Investment	$E_0(\text{Value})$	$E(\text{Payoff})$
I	$(\$36 \cdot 40\% + \$8 \cdot 60\%) / 1.05 = \$18.29$	$\$18.29 - \$18 = \$0.29$
II	$(\$12 \cdot 40\% + \$16 \cdot 60\%) / 1.05 = \$13.71$	$\$13.71 - \$14 = -\$0.29$
III	$(\$30 \cdot 40\% + \$5 \cdot 60\%) / 1.05 = \$14.29$	$\$14.29 - \$15 = -\$0.71$

A risk averse investor prefers investment I because to be induced to enter a risky situation, he needs a risk premium.

- B. Arbitrary
C. Arbitrary
D. Arbitrary

10. What is the expected return for a portfolio that has \$2,500 invested in a risk-free asset with 5 percent rate of return, and \$7,500 invested in a risky asset with a 17 percent rate of return and a 28 percent standard deviation?

- A. 8.00%
B. 10.75%
C. 14.00%
D. 22.25%

Answer: C

Type: Calculation

Difficulty: Easy

LO: 9.1

Explanation:

- A. Crisscross weights and returns
B. A) and D) combined
C. Portfolio expected return, $E(R_p) = 5\% \cdot 0.25 + 17\% \cdot 0.75 = 14\%$
D. Standard deviation of risky asset used as return in the computation

11. What is the standard deviation for a portfolio that has \$3,500 invested in a risk-free asset with 5 percent rate of return, and \$6,500 invested in a risky asset with a 15 percent rate of return and a 22 percent standard deviation?

A. 7.70%
 B. 9.75%
 C. 5.25%
 D. 14.30%

Answer: D Type: Calculation Difficulty: Easy LO: 9.1

Explanation:

A. Crisscross weights and standard deviation
 B. Risky asset return used as standard deviation in the computation
 C. A) and B) combined

D. Weight in risky asset, $w = \frac{\$6,500}{\$3,500 + \$6,500} = 0.65$

Portfolio standard deviation, $\sigma_p = 22\% * 0.65 = 14.3\%$

12. What are the expected return and standard deviation for a portfolio that has \$2,000 invested in a risk-free asset with 5.25 percent rate of return, \$8,000 invested in a risky asset with a 21 percent rate of return and a 35 percent standard deviation?

A. Expected return = 17.85%; standard deviation = 28.00%
 B. Expected return = 28.00%; standard deviation = 17.85%
 C. Expected return = 7.00%; standard deviation = 8.40%
 D. Expected return = 8.40%; standard deviation = 7.00%

Answer: A Type: Calculation Difficulty: Easy LO: 9.1

Explanation:

A. Weight in risky asset, $w = \frac{\$8,000}{\$2,000 + \$8,000} = 0.8$

Portfolio expected return, $E(R_p) = 5.25\% * 0.2 + 21\% * 0.8 = 17.85\%$

Portfolio standard deviation, $\sigma_p = 35\% * 0.8 = 28\%$

B. Reverse expected returns and standard deviations in A.
 C. Reverse expected returns and standard deviations in D.
 D. Crisscross weights and returns/standard deviations

13. A portfolio consists of two securities: a 90-day T-bill and S&P/TSX Composite. The expected return on the 90-day T-bill is 4.5 percent. The expected return on Stock S&P/TSX Composite is 12 percent with a standard deviation of 20 percent. What is the portfolio standard deviation if the expected return for this portfolio is 15 percent?

A. 8.13%
 B. 12.00%
 C. 16.80%
 D. 28.00%

Answer: D Type: Calculation Difficulty: Medium LO: 9.1

Explanation:

- A. Transpose X's standard deviation with return in the computation of portfolio weight and portfolio standard deviation
- B. Borrowing at risk free rate treated as investing in the computation of portfolio weights
- C. Stock return used as standard deviation in the computation of portfolio standard deviation

D. Weight in stock X, $w = \frac{15\% - 4.5\%}{12\% - 4.5\%} = 1.4$, weight in risk free asset = $1 - 1.4 = -0.4$

$$\sigma_P = 20\% * 1.4 = 28\%$$

14. A portfolio consists of two securities: a 90-day T-bill and Stock S&P/TSX Composite. The expected return on the 90-day T-bill is 4.5 percent. The expected return of Stock S&P/TSX Composite is 18 percent with a standard deviation of 30 percent. What is the portfolio expected return if the standard deviation for this portfolio is 50 percent?

- A. 12.60%
- B. 27.00%
- C. 30.00%
- D. 47.00%

Answer: B Type: Calculation Difficulty: Medium LO: 9.1

Explanation:

- A. Standard deviations of stock Y and portfolio inverted in the computation of portfolio weights.

B. Weight in stock Y, $w = \frac{50\%}{30\%} = 1.6667$, weight in risk free asset = $1 - 1.6667 = -0.6667$

$$\text{Portfolio expected return, } E(R_P) = 4.5\% * -0.6667 + 18\% * 1.6667 = 27\%$$

C. $18\% * 1.6667 = 30\%$

- D. Stock Y's standard deviation used as return in the computation of portfolio return

15. Which one of the following is NOT true?

- A. The separation theorem states that the borrowing decision and investment decision are separate.
- B. Investors should look at investments in terms of their prospective return not their cost
- C. The separation theorem states that you cannot separate your risk free and stock investments.
- D. The market portfolio is the tangent line that goes through the risk free rate.

Answer: C Type: Definition Difficulty: Medium LO: 9.1

16. A portfolio consists of two securities: a risk-free asset and an equity security. The expected return on the risk-free asset is 4.25 percent. The expected return of the equity security is 16 percent with a standard deviation of 22 percent. What is the portfolio standard deviation if the expected return for the portfolio is 12 percent?

A. 6.99%
 B. 7.49%
 C. 10.55%
 D. 14.51%

Answer: D Type: Calculation Difficulty: Medium LO: 9.1

Explanation:

- A. Transpose equity return with standard deviation in the computation of portfolio weights and portfolio standard deviation
 B. Crisscross weights and standard deviations
 C. Equity return used as standard deviation in the computation of portfolio standard deviation
 D. Weight in equity, $w = \frac{12\% - 4.25\%}{16\% - 4.25\%} = 0.6596$, weight in risk free asset = $1 - 0.6596 = 0.3404$

$$\text{Portfolio standard deviation, } \sigma_P = 22\% * 0.6596 = 14.51\%$$

17. Theoretically, what is meant by the market portfolio?

A. The market index portfolio similar to the S&P 500 or S&P/TSX Composite
 B. The world index portfolio similar to the MSCI AC World index
 C. All risky assets in the world with their own proportions
 D. All risky assets except real assets like real estate.

Answer: C Type: Concept Difficulty: Medium LO: 9.1

18. A portfolio consists of two securities: a risk-free asset and an equity security. The expected return on the risk-free asset is 4.75 percent. The expected return of the equity security is 17 percent with a standard deviation of 23 percent. What is the portfolio expected return if the standard deviation for the portfolio is 18 percent?

A. 7.41%
 B. 14.34%
 C. 18.00%
 D. 20.40%

Answer: B Type: Calculation Difficulty: Medium LO: 9.1

Explanation:

- A. Crisscross weights and returns
 B. Weight in equity, $w = \frac{18\%}{23\%} = 0.7826$, weight in risk free asset = $1 - 0.7826 = 0.2174$

$$\text{Portfolio expected return, } E(R_P) = 4.75\% * 0.2174 + 17\% * 0.7826 = 14.34\%$$

- C. Equity standard deviation taken as return in the computation of portfolio return
 D. Standard deviations of equity and portfolio inverted in the computation of portfolio weights

Section 9.2: The Capital Asset Pricing Model (CAPM)

19. The CML relates:

- A. expected return to beta.
- B. the risk-free rate to the market portfolio's rate of return.
- C. risk to beta.
- D. expected return to standard deviation.

Answer: D Type: Concept Difficulty: Easy LO: 9.2

20. Which of the following is a **NOT** an assumption of the CAPM?

- A. All investors have different expectations about expected returns, standard deviations, and correlation coefficients for all securities.
- B. All investors can borrow or lend money at the risk-free rate of return.
- C. There are no transaction costs.
- D. There are no personal income taxes so that investors are indifferent between capital gains and dividends.

Answer: A Type: Concept Difficulty: Medium LO: 9.2

21. By combining the risk-free asset and the efficient frontier, the _____ will be created.

- A. capital market line
- B. efficient frontier
- C. security market line
- D. attainable set

Answer: A Type: Concept Difficulty: Medium LO: 9.2

22. What does the capital market line represent?

- A. The highest attainable expected return for any given risk level that includes only efficient portfolios.
- B. The frontier of efficient portfolios of risky assets.
- C. The best return portfolio.
- D. The lowest variance portfolios.

Answer: A Type: Concept Difficulty: Medium LO: 9.2

23. Which of the following is **NOT** an implication resulting from the assumption that capital markets are in equilibrium?
- A. All assets are assumed to be bought and sold at the equilibrium price established by supply and demand.
 - B. All assets are not correctly priced to adequately compensate investors for the associated risks.
 - C. The price for an overpriced asset would eventually fall to an equilibrium level so that the asset is held by all investors.
 - D. The market portfolio will be the most efficient portfolio, with respect to the weights attached to the individual securities composing it.

Answer: B Type: Concept Difficulty: Medium LO: 9.2

24. Which of the following is a **FALSE** statement of the market price of risk?
- A. It is the incremental risk divided by the incremental expected return.
 - B. It is the slope of the capital market line.
 - C. It is the equilibrium price of risk in the capital market.
 - D. It indicates the additional expected return that the market demands for an increase in a portfolio's risk.

Answer: A Type: Concept Difficulty: Medium LO: 9.2

25. Use the following two statements to answer this question:
- I. The CML must always be upward sloping, and it predicts required returns.
 - II. The CML is based on expected rates of return, so it is ex post.
 - III. The CML slope is the Sharpe ratio.
- A. I and II, III are correct.
 - B. I and II, III are incorrect.
 - C. I, III are correct and II is incorrect.
 - D. I is incorrect, II, III is correct.

Answer: C Type: Concept Difficulty: Medium LO: 9.2

26. Which of the following is a **FALSE** statement about the Sharpe ratio?
- A. It is used to assess the performance of portfolios.
 - B. It describes how well an asset's return compensates investors for the risk taken.
 - C. It is the slope of the CML when the portfolio is not the market portfolio.
 - D. It is a "risk-adjusted" measure of portfolio performance.

Answer: C Type: Concept Difficulty: Medium LO: 9.2

27. The risk free rate is 5.25 percent. The expected return on the market is 12 percent with a standard deviation of 18 percent. What is the standard deviation of an efficient portfolio with a 16 percent expected return?

A. 7.33%
 B. 10.12%
 C. 19.11%
 D. 28.67%

Answer: D Type: Calculation Difficulty: Easy LO: 9.2

Explanations:

- A. Borrowing at risk free rate treated as investing in the computation of portfolio weights
 B. Transpose market return with standard deviation in the computation of portfolio weights and portfolio standard deviation
 C. Market return used as standard deviation

D. Weight in market portfolio, $w = \frac{16\% - 5.25\%}{12\% - 5.25\%} = 1.5926$

Weight in risk free asset = $1 - 1.5926 = -0.5926$

Portfolio standard deviation, $\sigma_P = 18\% * 1.5926 = 28.67\%$

28. The expected return on the market is 12.5 percent with a standard deviation of 25 percent. The risk free rate is 5.5 percent. What is the expected return on an efficient portfolio with a standard deviation of 30 percent?

A. 4.10%
 B. 11.33%
 C. 13.90%
 D. 28.90%

Answer: C Type: Calculation Difficulty: Easy LO: 9.2

Explanations:

- A. Crisscross weights and returns
 B. Standard deviations inverted in the computation of portfolio weight in market portfolio

C. Weight in market portfolio, $w = \frac{30\%}{25\%} = 1.20$, weight in risk free asset = $1 - 1.20 = -0.20$

Portfolio expected return, $E(RP) = 5.5\% * -0.2 + 12.5\% * 1.20 = 13.90\%$

D. Market portfolio standard deviation used as return in the computation of portfolio return

29. The expected return of a portfolio on the CML is 14 percent with a standard deviation of 25 percent. The risk free rate is 6 percent. What is the expected return on an efficient portfolio with a standard deviation of 30 percent?

A. 9.6%
 B. 15.6%
 C. 22.8%
 D. 16.8%

Answer: B Type: Calculation Difficulty: Medium LO: 9.2

Explanations:

A. $\frac{14-6}{25} \times 30 = 9.6\%$

B. $\frac{14-6}{25} \times 30 + 6 = 15.6\%$

C. $\frac{14}{25} \times 30 + 6 = 22.8\%$

D. $\frac{14}{25} \times 30 = 16.8\%$

30. The expected return of the market portfolio is 14 percent with a standard deviation of 25 percent. The risk free rate is 6 percent. What is the weight of the market portfolio in an efficient portfolio with a standard deviation of 30 percent?

A. 120%

B. 83.33%

C. 20%

D. 16.78%

Answer: A

Type: Calculation

Difficulty: Medium

LO: 9.2

Explanations:

A. $\frac{30}{25} = 120\%$

B. $\frac{25}{30} = 83.33\%$

C. $\frac{30}{25} - 1 = 20\%$

D. $\frac{25}{30} - 1 = 16.77\%$

31. The expected return of the market portfolio is 14 percent with a standard deviation of 25 percent. The risk free rate is 6 percent. What would be the weight of the market portfolio in an efficient portfolio with a standard deviation of 30 percent, if borrowing is not allowed?

A. 16.78%

B. 83.33%

C. 20%

D. Cannot be constructed

Answer: D

Type: Calculation

Difficulty: Difficult

LO: 9.2

Explanations:

A. $\frac{25}{30} - 1 = 16.77\%$

B. $\frac{25}{30} = 83.33\%$

C. $\frac{30}{25} - 1 = 20\%$

32. What is the standard deviation of an efficient portfolio with an 8 percent expected return? Assume the risk free rate is 3.75 percent and the expected return on the market portfolio is 10 percent with a standard deviation of 20 percent.

A. 2.62%
 B. 6.40%
 C. 6.80%
 D. 13.60%

Answer: D Type: Calculation Difficulty: Easy LO: 9.2

Explanations:

- A. Transpose market return with standard deviation in the computation of portfolio weights and portfolio standard deviation
 B. Crisscross weights and standard deviations
 C. Market return used as standard deviation in the computation of portfolio standard deviation

D. Weight in market portfolio, $w = \frac{8\% - 3.75\%}{10\% - 3.75\%} = 0.68$

Weight in risk free asset = $1 - 0.68 = 0.32$

Portfolio standard deviation, $\sigma_P = 20\% * 0.68 = 13.6\%$

33. What is the expected return on an efficient portfolio with a standard deviation of 15 percent? Assume the risk free rate is 6 percent and the expected return on the market portfolio is 14.8 percent with a standard deviation of 20 percent.

A. 8.20%
 B. 12.60%
 C. 16.50%
 D. 17.73%

Answer: B Type: Calculation Difficulty: Easy LO: 9.2

Explanations:

- A. Crisscross weights and returns

B. Weight in market portfolio, $w = \frac{15\%}{20\%} = 0.75$, weight in risk free asset = $1 - 0.75 = 0.25$

Portfolio expected return, $E(R_P) = 6\% * 0.25 + 14.8\% * 0.75 = 12.6\%$

- C. Market standard deviation used as return in the computation of portfolio return
 D. Standard deviations of market and portfolio inverted in the computation of portfolio weights

34. If the market portfolio's return is 15 percent and its standard deviation is 20%, which one of the following is NOT efficient, if the risk free rate is 5%?

- A. $E(r) = 15\%$ $\sigma = 12.5\%$
- B. $E(r) = 20\%$ $\sigma = 30\%$
- C. $E(r) = 13\%$ $\sigma = 17\%$
- D. $E(r) = 12\%$ $\sigma = 14\%$

Answer: C

Type: Calculation

Difficulty: Medium

LO: 9.2

Explanations:

$$\text{Sharpe Ratio} = \frac{15\% - 5\%}{20\%} = 0.5$$

$$E(r) = 5\% + 0.5 \times \sigma$$

35. If the market portfolio's return is 15 percent and its standard deviation is 20%, which one of the following efficient portfolios requires borrowing, if the risk free rate is 5%?

- A. $E(r) = 15\%$ $\sigma = 12.5\%$
- B. $E(r) = 20\%$ $\sigma = 30\%$
- C. $E(r) = 11.5\%$ $\sigma = 13\%$
- D. $E(r) = 12\%$ $\sigma = 14\%$

Answer: B

Type: Concept

Difficulty: Medium

LO: 9.2

Explanations:

The only way to exceed the market return is to borrow and invest more than 100% of wealth in the market portfolio.

36. Greg has \$10,000 to invest in a risk-free asset and the market portfolio. The risk free rate is 4.8 percent. The market portfolio has an expected return of 13.6 percent with a standard deviation of 15 percent. What are the expected return and standard deviation for a portfolio with 30 percent of the funds invested in the risk free asset?

A. Expected return = 10.50%; standard deviation = 10.96%
 B. Expected return = 10.96%; standard deviation = 10.50%
 C. Expected return = 4.50%; standard deviation = 7.44%
 D. Expected return = 7.44%; standard deviation = 4.50%

Answer: B Type: Calculation Difficulty: Easy LO: 9.2

Explanations:

A. Reverses (B's) expected returns and standard deviations

B. Portfolio expected return, $E(R_p) = 4.8\% * 0.30 + 13.6\% * 0.70 = 10.96\%$

Portfolio standard deviation, $\sigma_p = 15\% * 0.70 = 10.50\%$

C. Reverses (D's) expected returns and standard deviations

D. Crisscross weights and returns/standard deviations

37. The expected return on the market is 12 percent with a standard deviation of 20 percent. The risk free rate is 4.5 percent. What is the Sharpe ratio of a portfolio with an expected return of 10.5 percent and a standard deviation of 12 percent?

A. 0.38
 B. 0.50
 C. 0.70
 D. 0.88

Answer: B Type: Calculation Difficulty: Easy LO: 9.2

Explanations:

A. Market price of risk

B. Sharpe ratio = $\frac{10.5\% - 4.5\%}{12\%} = 0.5$

C. arbitrary

D. Portfolio return/portfolio standard deviation

38. The expected return on the market is 12 percent with a standard deviation of 15 percent and the risk free rate is 5 percent. What is the required return on an efficient portfolio that has a standard deviation of 18 percent?

A. 10.83%
 B. 12.67%
 C. 13.40%
 D. 14.40%

Answer: C Type: Calculation Difficulty: Easy LO: 9.2

Explanations:

- A. Standard deviations of portfolio and market inverted in the computation
- B. Arbitrary

C. Portfolio expected return, $E(R_P) = 5\% + \left(\frac{12\% - 5\%}{15\%}\right)18\% = 13.4\%$

- D. Market return taken as market risk premium in the computation

39. Min has \$5,000 to invest. The expected return on the market portfolio is 11 percent with a standard deviation of 15 percent. What are the expected return and standard deviation for the portfolio if she borrowed an additional \$2,000 at the risk free rate of 4 percent to invest in the market portfolio?

- A. Expected return = 19.40%; standard deviation = 15.40%
- B. Expected return = 15.40%; standard deviation = 19.40%
- C. Expected return = 13.80%; standard deviation = 21.00%
- D. Expected return = 21.00%; standard deviation = 13.80%

Answer: C Type: Calculation Difficulty: Medium LO: 9.2

Explanations:

- A. Transpose market return with standard deviation in the computations
- B. Reverses (A's) expected returns and standard deviations

C. Portfolio expected return, $E(R_P) = 4\% * -0.4 + 11\% * 1.40 = 13.80\%$

Portfolio standard deviation, $\sigma_P = 15\% * 1.40 = 21\%$

- D. Reverses (C's) expected returns and standard deviations

40. Suppose you have \$5,000 to invest in a risk-free asset and the market portfolio. The expected return on the market portfolio is 13.5 percent with a standard deviation of 18 percent. The risk free rate is 4.25 percent. How much of your funds should be in the risk-free asset if the portfolio has an expected return of 10 percent?

- A. \$1,892
- B. \$2,091
- C. \$2,909
- D. \$3,108

Answer: A Type: Calculation Difficulty: Medium LO: 9.2

Explanations:

A. Weight in risk free asset, $w = \frac{10\% - 13.5\%}{4.25\% - 13.5\%} = 0.3784$

Amount invested in risk free asset = \$5,000 * 0.3784 = \$1,892

- B. Amount invested in market portfolio in C)
- C. Market standard deviation used as return in the computation of portfolio weights
- D. Amount invested in market portfolio in A)

41. Suppose you have \$2,000 to invest. The market portfolio has an expected return of 10.5 percent and a standard deviation of 16 percent. The risk free rate is 3.75 percent. How much should you invest in the risk-free asset if you wish to have a 15 percent return on the portfolio?

A. \$667
 B. -\$667
 C. \$1,333
 D. -\$1,333

Answer: D Type: Calculation Difficulty: Medium LO: 9.2

Explanations:

A. Answer in B) with sign reversed
 B. weight in risk free asset * 1,000
 C. Answer in D) with sign reversed

D. Weight in risk free asset, $w = \frac{15\% - 10.5\%}{3.75\% - 10.5\%} = -0.6667$

Amount invested in risk free asset = \$2,000 * (-0.6667) = -\$1,333

42. Marie has \$10,000 to invest. She decided to borrow some funds at the risk-free rate of 6 percent to increase her investment in a portfolio with an expected return of 25 percent and a standard deviation of 30 percent. What is the expected return and standard deviation for her portfolio if she borrowed 50 percent of the portfolio value?

A. Expected return = 34.50%; standard deviation = 45.00%
 B. Expected return = 45.00%; standard deviation = 34.50%
 C. Expected return = 44.00%; standard deviation = 60.00%
 D. Expected return = 60.00%; standard deviation = 44.00%

Answer: C Type: Calculation Difficulty: Medium LO: 9.2

Explanations:

A. -0.5/1.5 in risk free asset and risky asset
 B. A's answers reversed

C. Weight in risk free asset = $\frac{-50\%}{1 - 50\%} = -1$, weight in risky asset = $1 - (-1) = 2$

Portfolio expected return, $E(R_p) = 6\% * (-1) + 25\% * 2 = 44\%$

Portfolio standard deviation, $\sigma_p = 30\% * 2 = 60\%$

D. C's answers reversed

43. The expected return on the market portfolio is 13 percent with a standard deviation of 16 percent. What are the expected return and standard deviation for a portfolio with 40 percent of the investment in the market portfolio borrowed at the risk free rate of 5 percent?

A. Expected return = 26.67%; expected return = 18.33%
 B. Expected return = 18.33%; standard deviation = 26.67%
 C. Expected return = 22.40%; standard deviation = 16.20%
 D. Expected return = 16.20%; standard deviation = 22.40%

Answer: B Type: Calculation Difficulty: Difficult LO: 9.2

Explanations:

A. reverses answers in B

B. Weight in risk free asset, $w = \frac{-40\%}{1-40\%} = -0.6667$

Weight in market portfolio = $1 + 0.6667 = 1.6667$

Portfolio expected return, $E(R_p) = 5\% * -0.667 + 13\% * 1.667 = 18.33\%$

Portfolio standard deviation, $\sigma_p = 16\% * 1.667 = 26.67\%$

C. Reverses answers in D

D. $-0.4/1.4$ in risk free asset and market portfolio

44. The expected return of Security A is 12 percent with a standard deviation of 15 percent. The expected return of Security B is 9 percent with a standard deviation of 10 percent. Securities A and B have a correlation of 0.4. The market return is 11 percent with a standard deviation of 13 percent and the risk free rate is 4 percent. What is the Sharpe ratio of a portfolio if 35 percent of the portfolio is in Security A and the remainder in Security B?

- A. 0.54
B. 0.61
C. 0.86
D. 1.02

Answer: B Type: Calculation Difficulty: Difficult LO: 9.2

Explanations:

A. Market price of risk

B. Portfolio standard deviation, $\sigma_p = \sqrt{0.002756 + 0.004225 + 0.002730} = 9.85\%$

Portfolio expected return, $E(R_p) = 12\% * 0.35 + 9\% * 0.65 = 10.05\%$

Sharpe ratio of portfolio = $\frac{10.05\% - 4\%}{9.85\%} = 0.61$

C. arbitrary

D. Portfolio return/portfolio standard deviation

45. The expected return of Security A is 12 percent with a standard deviation of 15 percent. The expected return of Security B is 9 percent with a standard deviation of 10 percent. Securities A and B have a correlation of 0.4. The market return is 11 percent with a standard deviation of 13 percent and the risk free rate is 4 percent. Which one of the following is not an efficient portfolio, as determined by the lowest Sharpe ratio?

- A. 100% invested in A is efficient
B. 100% invested in B is efficient
C. 41% in A and 59% B is efficient
D. 59% in A and 41% B is efficient

Answer: B Type: Calculation Difficulty: Difficult LO: 9.2

Explanations:

A. Arbitrary

B. Arbitrary

C. Solve for $\omega_A; \omega_B$ subject to: $\frac{12\omega_A + 9\omega_B - 4}{\sqrt{(15\omega_A)^2 + (10\omega_B)^2}} = \frac{11-4}{13}$ and $\omega_A + \omega_B = 1$

D. Inversed values

Use the market's sharpe ratio to compare the sharpe ratio of each portfolio and find the

lowest Sharpe ratio $\frac{11\% - 4\%}{13\%} = 0.5385$ is the market sharpe ratio. The Sharpe ratio for A:

$\frac{12\% - 4\%}{15\%} = 0.5333$ The Sharpe ratio for B: $\frac{9\% - 4\%}{10\%} = 0.50$ The Sharpe ratio for C:

$\frac{10.23\% - 4\%}{8.528\%} = 0.7305$ The Sharpe ratio for D: $\frac{10.77 - 4\%}{11.14\%} = 0.6077$

46. The expected returns for Securities ABC and XYZ are 8 percent and 13 percent, respectively. The standard deviation is 12 percent for ABC and 18 percent for XYZ. There is no relationship between the returns on the two securities. The market return is 12.5 percent with a standard deviation of 16 percent. The risk free rate is 5 percent. What is the Sharpe ratio of a portfolio with 40 percent of the funds in ABC and 60 percent in XYZ?

A. 0.47

B. 0.51

C. 0.75

D. 0.93

Answer: B Type: Calculation Difficulty: Difficult LO: 9.2

Explanations:

A. Market price of risk

B. Portfolio standard deviation, $\sigma_P = \sqrt{0.4^2 \times 0.12^2 + 0.6^2 \times 0.18^2} = 11.82\%$

Portfolio expected return, $E(R_P) = 8\% \times 0.4 + 13\% \times 0.6 = 11\%$

Sharpe ratio of portfolio $= \frac{11\% - 5\%}{11.82\%} = 0.51$

C. Arbitrary

D. Portfolio return/portfolio standard deviation

47. The expected returns for Securities ABC and XYZ are 8 percent and 13 percent, respectively. The standard deviation is 12 percent for ABC and 18 percent for XYZ. There is no relationship between the returns on the two securities. The market return is 12.5 percent with a standard deviation of 16 percent. The risk free rate is 5 percent. Which of the following is not an efficient portfolio as determined by the lowest Sharpe ratio?

A. 100% invested in ABC is efficient

B. 100% invested in XYZ is efficient

C. 52% in ABC and 48% XYZ is efficient

D. 48% in ABC and 52% XYZ is efficient

Answer: A Type: Calculation Difficulty: Difficult LO: 9.2

Explanations:

A. Arbitrary

B. Arbitrary

C. Inversed values

D. Solve for ω_A, ω_B subject to: $\frac{8\omega_{ABC} + 13\omega_{XYZ} - 5}{\sqrt{(12\omega_{ABC})^2 + (18\omega_{XYZ})^2}} = \frac{12.5 - 5}{16}$ and $\omega_{ABC} + \omega_{XYZ} = 1$

Use the market's sharpe ratio to compare the sharpe ratio of each portfolio and find the

lowest Sharpe ratio $\frac{12.5\% - 5\%}{16\%} = 0.4688$ is the market sharpe ratio. The Sharpe ratio for A:

$\frac{8\% - 5\%}{12\%} = 0.25$ The Sharpe ratio for B: $\frac{13\% - 5\%}{18\%} = 0.4444$ The Sharpe ratio for C:

$\frac{10.4\% - 5\%}{10.65\%} = 0.507$ The Sharpe ratio for D: $\frac{10.6 - 5\%}{10.99\%} = 0.5096$

48. The expected return on the market is 11.5 percent with a standard deviation of 13 percent and the risk free rate is 4 percent. Which of the following portfolios are undervalued?

Portfolio	Expected Return	Standard Deviation
1	9%	7%
2	10%	15%
3	15%	20%
4	18%	24%

A. 1 and 2 only

B. 1 and 4 only

C. 2 and 3 only

D. 3 and 4 only

Answer: B Type: Calculation Difficulty: Medium LO: 9.2

Explanations:

A. Portfolio expected return less than market

B. Market price of risk $\frac{11.5\% - 4.0\%}{13\%} = 0.577$

Price of risk for Portfolio 1 = $\frac{9\% - 4\%}{7\%} = 0.714 > 0.577$, undervalued

Price of risk for Portfolio 2 = $\frac{10\% - 4\%}{15\%} = 0.400 < 0.577$, overvalued

Price of risk for Portfolio 3 = $\frac{15\% - 4\%}{20\%} = 0.550 < 0.577$, overvalued

Price of risk for Portfolio 4 = $\frac{18\% - 4\%}{24\%} = 0.583 > 0.577$, undervalued

C. Arbitrary

D. Portfolio expected return greater market

49. The expected return on the market is 15 percent with a standard deviation of 12.5 percent and the risk free rate is 5 percent. Which of the following portfolios are correctly priced?

Portfolio	Expected Return	Standard Deviation
1	30.00%	28.75%
2	25.00%	25.00%
3	10.00%	6.25%
4	9.00%	5.50%

- A. 1 and 3 only
 B. 1 and 4 only
 C. 2 and 3 only
 D. 3 and 4 only

Answer: C Type: Calculation Difficulty: Medium LO: 9.2

Explanations:

A. Arbitrary

B. Arbitrary

C. Market price of risk = $\frac{15\% - 5\%}{12.5\%} = 0.80$

Price of risk for Portfolio 1 = $\frac{30\% - 5\%}{28.75\%} = 0.87 > 0.80$, underpriced

Price of risk for Portfolio 2 = $\frac{25\% - 5\%}{25\%} = 0.80 = 0.80$, correctly priced

Price of risk for Portfolio 3 = $\frac{10\% - 5\%}{6.25\%} = 0.80 = 0.80$, correctly priced

Price of risk for Portfolio 4 = $\frac{9\% - 5\%}{5.5\%} = 0.73 < 0.8$, overpriced

D. Portfolio returns less than market

50. The expected return on the market is 12 percent with a standard deviation of 15 percent and the risk free rate is 4.5 percent. Which of the following portfolios are overvalued?

Portfolio	Expected Return	Standard Deviation
1	19%	20%
2	18%	19%
3	10%	13%
4	9%	12%

- A. 1 and 2 only
 B. 1 and 4 only
 C. 2 and 3 only
 D. 3 and 4 only

Answer: D Type: Calculation Difficulty: Medium LO: 9.2

Explanations:

A. Arbitrary

B. Arbitrary

C. Arbitrary

D. Market price of risk $= \frac{12\% - 4.5\%}{15\%} = 0.50$

Price of risk for Portfolio 1 $= \frac{19\% - 4.5\%}{20\%} = 0.73 > 0.50$, undervalued

Price of risk for Portfolio 2 $= \frac{18\% - 4.5\%}{19\%} = 0.71 > 0.50$, undervalued.

Price of risk for Portfolio 3 $= \frac{10\% - 4.5\%}{13\%} = 0.42 < 0.50$, overvalued

Price of risk for Portfolio 4 $= \frac{9\% - 4.5\%}{12\%} = 0.38 < 0.50$, overvalued

Section 9.3 The CAPM and Market Risk

51. The _____ measures the sensitivity of the portfolio to changes in the overall market.

A. risk-free rate

B. beta

C. risk

D. market premium

Answer: B

Type: Concept

Difficulty: Easy LO: 9.3

52. Under the CAPM, an investor should be compensated for bearing:

A. total risk

B. diversifiable risk

C. systematic risk

D. unsystematic risk

Answer: C

Type: Concept

Difficulty: Easy LO: 9.3

53. Beta is a measure of :

A. Total risk.

B. Diversifiable risk.

C. Systematic risk.

D. Unsystematic risk.

Answer: C

Type: Concept

Difficulty: Easy LO: 9.3

54. Assume that the CAPM holds. If a security has a beta of 1, its expected return is:

A. the risk-free rate

B. 0 percent

C. the return on the market portfolio

D. Can't be determined with the above information

Answer: C

Type: Concept

Difficulty: Easy LO: 9.3

55. Use the following three statements to answer this question:

- I. The capital market line (CML) depicts the highest attainable expected return for any given risk level that includes only efficient portfolios.
- II. The security market line (SML) depicts the required rate of return for any given risk level that includes only individual securities.
- III. The Security Market Line (SML) measures the price of systematic risk.

- A. I, II and III are correct.
- B. I, II and III are incorrect.
- C. I and III are correct, II is incorrect.
- D. I is incorrect, II and III is correct.

Answer: C Type: Concept Difficulty: Medium LO: 9.3

56. Use the following three statements to answer this question:

- I. The CAPM points out that rational investors should be compensated for unique risk.
- II. The CAPM implies that unsystematic risk is the appropriate measure of risk to determine the risk premium required by investors for holding a risky security.
- III. The expected return from unsystematic risk is zero.

- A. I, II and II are correct.
- B. I and II are incorrect, III is correct.
- C. I, II are correct, III is incorrect.
- D. I, II are incorrect, II is correct.

Answer: B Type: Concept Difficulty: Medium LO: 9.3

57. Use the following three statements to answer this question:

- I. A security with a beta of zero implies that all of the variability in this security's return is diversifiable by any investor holding a well-diversified portfolio.
- II. A security with a beta of 1 implies that if the market increased (or decreased) by 1 percent, the return on the security would increase (decrease) by more than 1 percent on average.
- III. A security that has a beta cannot be priced.

- A. I, II and III are correct.
- B. I, II and III are incorrect.
- C. I is correct, II and III are incorrect.
- D. I, II are incorrect, III is correct.

Answer: C Type: Concept Difficulty: Medium LO: 9.3

58. Which of the following is **NOT** a correct statement of beta?

- A. It is a measure of market risk.
- B. It measures the risk of an individual stock or portfolio relative to the market portfolio.
- C. It is the slope of the capital market line.
- D. It changes through time as the risk of the underlying security or portfolio changes.

Answer: C Type: Concept Difficulty: Medium LO: 9.3

59. Which of the following is a FALSE statement about the security market line (SML)?
- A. It is upward sloping, which indicates that investors require a higher expected return on riskier securities.
 - B. It represents the trade off between total risk and the required rate of return for any risky security.
 - C. It indicates that the size of risk premium varies directly with a security's market risk, as measured by beta.
 - D. It implies that securities with betas less than the market beta of 1.0 are less risky than the "average" stock and will therefore have lower required rates of return.

Answer: B Type: Concept Difficulty: Medium LO: 9.3

60. Use the following two statements to answer this question:

I. In equilibrium, the expected return on all properly priced securities will lie on the SML.

II. Securities that are undervalued will lie below the SML.

- A. I and II are correct.
- B. I and II are incorrect.
- C. I is correct, II is incorrect.
- D. I is incorrect, II is correct.

Answer: C Type: Concept Difficulty: Medium LO: 9.3

61. Assuming the CAPM is valid, _____ securities lie _____ the Security Market Line.

- A. undervalued, below
- B. overvalued, on
- C. undervalued, on
- D. overvalued, below

Answer: D Type: Concept Difficulty: Medium LO: 9.3

62. _____ is a measure of the risk of a security that cannot be avoided through diversification.

- A. Variance
- B. Standard deviation
- C. Total risk
- D. Beta

Answer: D Type: Concept Difficulty: Medium LO: 9.3

63. The beta of a portfolio can be calculated as:

- A. A sum of the betas of the stocks in the portfolio.
- B. The weighted sum of the betas in the portfolio.
- C. The average of the betas in the portfolios.
- D. The weighted sum of the betas plus the correlation between betas.

Answer: B Type: Definition Difficulty: Medium LO: 9.3

64. Given the following information, what is the beta of Stock X?

Month	Stock X Return	S&P/TSX Return
January	10%	8%
February	8%	12%
March	-5%	5%
April	-10%	-2%
May	9%	5%
June	15%	10%

- A. 0.08
- B. 0.41
- C. 0.62
- D. 1.61

Answer: D Type: Calculation Difficulty: Difficult LO: 9.3

Explanations:

- A. $COV_{X,M} / \sigma_M$
- B. $COV_{X,M} / \sigma_X^2$
- C. $\sigma_M^2 / COV_{X,M}$

D. Stock X average return, $\bar{r}_X = \frac{10\% + 8\% - 5\% - 10\% + 9\% + 15\%}{6} = 4.5\%$

S&P/TSE (market) average return, $\bar{r}_M = \frac{8\% + 12\% + 5\% - 2\% + 5\% + 10\%}{6} = 6.33\%$

S&P/TSE (market) variance, $\sigma_M^2 = \sum_{i=1}^6 \frac{(r_{M,i} - 6.33\%)^2}{6-1} = 0.002427$

$COV_{X,M} = \sum_{i=1}^6 \frac{(r_{X,i} - 4.50\%)(r_{M,i} - 6.33\%)}{6-1} = 0.0039$

Beta of stock X, $\beta_X = \frac{0.0039}{0.002427} = 1.61$

65. Use the following two statements to answer this question:

- I. The characteristic line is a statistical approximation of the SML.
- II. The SML ignores the unsystematic risk of a security.
- A. I and II are correct
- B. I is correct, II is incorrect
- C. I and II are incorrect
- D. I is incorrect and II is correct

Answer: D Type: Concept Difficulty: Medium LO: 9.3

66. Stock A has a standard deviation of 20 percent and a correlation coefficient of 0.64 with market returns. The expected return of the market is 12 percent with a standard deviation of 15 percent. The risk-free rate is 5 percent. What is the beta of Stock A?

- A. 0.48
- B. 0.75
- C. 0.85
- D. 1.33

Answer: C Type: Calculation Difficulty: Easy LO: 9.3

Explanations:

A. Standard deviations of Stock A and market inverted in the computation

B. $.15/.20 = .75$

C. Beta of stock A, $\beta_A = \frac{0.64 * 20\%}{15\%} = 0.85$

D. $0.20/.15 = 1.33$

67. What is the difference between the Security Market Line (SML) and the Capital Market Line (CML)?

- A. SML prices total risk where CML prices **unsystematic** risk
- B. SML prices systematic risk where CML prices **total** risk
- C. SML prices total risk where CML prices **unsystematic** risk
- D. SML prices systematic risk where CML prices **unsystematic** risk

Answer: B Type: Calculation Difficulty: Easy LO: 9.3

68. Stock X has a standard deviation of 25 percent and a correlation coefficient of 0.7 with market returns. The expected return of the market is 12 percent with a standard deviation of 15 percent. The risk-free rate is 5 percent. What is the required return of Stock X?

- A. 7.94%
- B. 9.56%
- C. 13.17%
- D. 15.28%

Answer: C Type: Calculation Difficulty: Medium LO: 9.3

Explanations:

- A. Standard deviation of stock X and market inverted in the computation of portfolio weights
- B. Arbitrary

C. Beta of stock X, $\beta_X = \frac{0.7 * 25\%}{15\%} = 1.1667$

Required return of stock X, $r_X = 5\% + 1.1667(12\% - 5\%) = 13.17\%$

- D. Arbitrary

69. Use the following two statements to answer this question:

- I. Beta is constant over time.
- II. Empirically beta is never negative.
- III. Negative beta implies a negative standard deviation.
- A. I, II and III are correct.
- B. I, II and III are incorrect.
- C. I is correct, II and III are incorrect.
- D. I, II are incorrect, III is correct.

Answer: B

Type: Concept

Difficulty: Difficult LO: 9.3

70. According to the Capital Asset Pricing Model (CAPM), which one of the following statements is **NOT true**?

- A. The expected rate of return of a security decreases proportionally with a decrease in the risk-free rate.
- B. The expected rate of return of a security increases as its beta increases.
- C. A fairly priced security has an alpha of zero.
- D. In equilibrium, all securities lie on the security market line.

Answer: A

Type: Concept

Difficulty: Easy

LO: 9.3

71. Stock Y has a standard deviation of 22 percent and a covariance with the market of 0.081.

The expected return of the market is 14 percent with a standard deviation of 18 percent. The risk-free rate is 5.25 percent. What is the beta of Stock Y?

- A. 0.37
- B. 0.45
- C. 1.67
- D. 2.50

Answer: D

Type: Calculation

Difficulty: Medium

LO: 9.3

Explanations:

- A. Covariance/standard deviation of Y
- B. Covariance/standard deviation of market
- C. Covariance/variance of Y

D. Beta of stock Y, $\beta_Y = \frac{0.081}{18\% * 18\%} = 2.5$

72. Which one of the following stocks does NOT have a beta close to 1?

- A. A stock that is part of the most dominant industry.
- B. A stock that has a very high capitalization.
- C. A newly listed stock.
- D. The stock of well-established firm.

Answer: C Type: Concept Difficulty: Medium LO: 9.3

73. Stock Z has a standard deviation of 18 percent and a covariance with the market of 0.0625.

The expected return of the market is 13 percent with a standard deviation of 20 percent. The risk-free rate is 5 percent. What is the required return of Stock Z?

- A. 7.50%
- B. 7.78%
- C. 17.50%
- D. 20.43%

Answer: C Type: Calculation Difficulty: Medium LO: 9.3

Explanations:

A. Market standard deviation used as market variance in the computation of Z's beta

B. Stock Z standard deviation used as market variance in the computation of Z's beta

C. Beta of stock Z, $\beta_Z = \frac{0.0625}{20\% * 20\%} = 1.5625$

Required return of stock Z, $r_Z = 5\% + 1.5625 * (13\% - 5\%) = 17.5\%$

D. Stock Z variance used as market variance in the computation of Z's beta

74. The current price of Stock Y is \$12. It is expected that the stock will pay an annual dividend of \$0.60 and sell for \$13.5 in one year. The risk-free rate is 6 percent. The expected return on the market portfolio is 14 percent with a standard deviation of 17 percent. Assume the market is in equilibrium. What is the beta of Stock Y?

- A. 0.70
- B. 0.96
- C. 1.25
- D. 1.44

Answer: D Type: Calculation Difficulty: Difficult LO: 9.3

Explanations:

A. $\frac{r_Y - r_f}{r_M - r_f}$ inverted in the computation of Y's beta

B. Arbitrary

C. Arbitrary

D. Return on stock Y, $r_Y = \frac{\$0.6 + \$13.5}{\$12} - 1 = 17.5\%$

Beta of stock Y, $\beta_Y = \frac{r_Y - r_f}{r_M - r_f} = \frac{17.5\% - 6\%}{14\% - 6\%} = 1.44$

75. What is the beta of a portfolio if 40 percent of the funds are invested in a risk-free asset and the balance of the funds is invested in the market portfolio?

- A. 0.4
- B. 0.6
- C. 0.8
- D. 1.0

Answer: B Type: Calculation Difficulty: Easy LO: 9.3

Explanations:

- A. Crisscross weights and betas
- B. Beta of portfolio, $\beta_P = 1 * 0.6 = 0.6$
- C. Arbitrary
- D. Arbitrary

76. What is the beta of a portfolio if 40 percent of the funds invested in the market portfolio are borrowed at the risk-free rate?

- A. 0.60
- B. 0.83
- C. 1.40
- D. 1.67

Answer: D Type: Calculation Difficulty: Medium LO: 9.3

Explanations:

- A. 0.4/0.6 in risk free asset and market portfolio
- B. Arbitrary
- C. -0.4/1.4 in risk free asset and market portfolio

D. Weight in risk free asset = $\frac{-40\%}{1 - 40\%} = -0.67$, weight in market portfolio = $1 - (-0.67) = 1.67$

Portfolio beta, $\beta_P = 1 * 1.67 = 1.67$

77. What is the beta of a portfolio if 30 percent of the funds are invested in a risk-free asset, 40 percent in the market portfolio, and the balance in a portfolio that has three times the risk of the market portfolio?

- A. 0.4
- B. 0.7
- C. 1.3
- D. 1.8

Answer: C Type: Calculation Difficulty: Easy LO: 9.3

Explanations:

- A. $.4 * 1$
- B. $.7 * 1$
- C. Portfolio beta, $\beta_P = 1 * 0.4 + 3 * 0.3 = 1.3$
- D. $0.6 * 3 = 1.8$

78. What is the beta of a portfolio if 20 percent of the funds are invested in Stock A with a beta of 2, 30 percent in Stock B with a beta of 0.8, 15 percent in Stock C with a beta of 2.2, and the remainder in Stock D with a beta of 1.4?

- A. 1.23
- B. 1.46
- C. 1.74
- D. 1.98

Answer: B

Type: Calculation

Difficulty: Easy

LO: 9.3

Explanations:

- A. Arbitrary
- B. Portfolio beta, $\beta_P = 2 * 0.2 + 0.8 * 0.3 + 2.2 * 0.15 + 1.4 * 0.35 = 1.46$
- C. Arbitrary
- D. Arbitrary

79. Suppose the beta of a four-asset portfolio is 1.8. The portfolio is composed of \$1,500 invested in Stock W, \$2,000 in Stock X, \$2,500 in Stock Y, and \$3,000 in Stock Z. What is the beta of Stock Z if the betas of Stock W, X, and Y are 0.7, 1.3, and 2.5, respectively?

- A. 0.7
- B. 1.1
- C. 1.6
- D. 2.1

Answer: D

Type: Calculation

Difficulty: Medium

LO: 9.3

Explanations:

- A. Arbitrary
- B. Portfolio beta – sum (beta*wt) of W, X, and Y
- C. Arbitrary
- D. Total portfolio value = \$1,500 + \$2,000 + \$2,500 + \$3,000 = \$9,000

$$\text{Stock Z's beta, } \beta_Z = \frac{1.8 - 0.7 \times \frac{\$1,500}{\$9,000} - 1.3 \times \frac{\$2,000}{\$9,000} - 2.5 \times \frac{\$2,500}{\$9,000}}{\frac{\$3,000}{\$9,000}} = 2.1$$

80. A portfolio is composed of \$2,000 invested in Stock A, \$3,000 in Stock B, \$4,000 in Stock C, and \$5,000 in Stock D. What is the beta of the portfolio if the betas of Stock A, B, C, and D are 0.9, 1.6, 1.8 and 1.2, respectively?

A. 1.03
 B. 1.26
 C. 1.41
 D. 1.65

Answer: C Type: Calculation Difficulty: Easy LO: 9.3

Explanations:

A. Arbitrary

B. Arbitrary

C. Total portfolio value = \$2,000 + \$3,000 + \$4,000 + \$5,000 = \$14,000

$$\text{Portfolio beta, } \beta_P = 0.9 \times \frac{\$2,000}{\$14,000} + 1.6 \times \frac{\$3,000}{\$14,000} + 1.8 \times \frac{\$4,000}{\$14,000} + 1.2 \times \frac{\$5,000}{\$14,000} = 1.41$$

D. Arbitrary

81. Suppose you have \$4,000 to invest in Stock X and Y. Stock X has an expected return of 13.5 percent and a beta of 1.2. Stock Y has an expected return of 18 percent and a beta of 2. How much should you invest in Stock X if you wish to have a portfolio beta of 1.5?

A. \$1,500
 B. \$1,750
 C. \$2,250
 D. \$2,500

Answer: D Type: Calculation Difficulty: Medium LO: 9.3

Explanations:

A. Weight in Stock Y in D)

B. Arbitrary

C. Arbitrary

D. Weight in stock X, $w = \frac{1.5 - 2}{1.2 - 2} = 0.625$

$$\text{Amount in stock X} = \$4,000 \times 0.625 = \$2,500$$

82. Suppose you have \$3,600 to invest in Securities A and B. Security A has an expected return of 6 percent and a beta of 0.5. Stock B has an expected return of 20 percent and a beta of 1.8. What is the expected return on the portfolio if the portfolio beta is 2.0?

A. 24.00%
 B. 23.65%
 C. 22.15%
 D. 22.22%

Answer: C Type: Calculation Difficulty: Medium LO: 9.3

Explanations:

A. Arbitrary

B. Arbitrary

C. Portfolio weight in A, $w = \frac{2-1.8}{0.5-1.8} = -0.1538$, weight in B = $1 - (-0.1538) = 1.1538$

Portfolio expected return, $E(R_p) = 6\% * -0.1538 + 20\% * 1.1538 = 22.15\%$

D. Arbitrary

83. The expected return on the market is 12 percent with a standard deviation of 16 percent and the risk free rate is 4.5 percent. Which of the following portfolios are overpriced?

Portfolio	Expected Return	Beta
1	15%	1.2
2	12%	1.1
3	10%	0.9
4	9%	0.6

A. 1 and 3 only

B. 1 and 4 only

C. 2 and 3 only

D. 2 and 4 only

Answer: C

Type: Calculation

Difficulty: Medium

LO: 9.3

Explanations:

A. Arbitrary

B. Arbitrary

C. Market risk premium = $12\% - 4.5\% = 7.5\%$

Port.	Beta	Required Return		E(R)	
1	1.2	$4.5\% + 1.2*(7.5\%) = 13.50\%$	<	15%	Underpriced
2	1.1	$4.5\% + 1.1*(7.5\%) = 12.75\%$	>	12%	Overpriced
3	0.9	$4.5\% + 0.9*(7.5\%) = 11.25\%$	>	10%	Overpriced
4	0.6	$4.5\% + 0.6*(7.5\%) = 9.00\%$	=	9%	Correctly priced

D. Arbitrary

84. The expected return on the market is 14 percent with a standard deviation of 18 percent and the risk free rate is 5 percent. Which of the following portfolios are underpriced?

Portfolio	Expected Return	Beta
1	18%	1.3
2	14%	1.1
3	12%	0.7
4	8%	0.6

A. 1 and 2 only

B. 1 and 3 only

C. 2 and 3 only

D. 3 and 4 only

Answer: B

Type: Calculation

Difficulty: Medium

LO: 9.3

Explanations:

A. Arbitrary

B. Market risk premium = $14\% - 5\% = 9\%$

Portfolio	Beta	Required Return		E(R)	
1	1.3	$5\% + 1.3 \times 9\% = 16.7\%$	<	18%	Underpriced
2	1.1	$5\% + 1.1 \times 9\% = 14.9\%$	>	14%	Overpriced
3	0.7	$5\% + 0.7 \times 9\% = 11.3\%$	<	12%	Underpriced
4	0.6	$5\% + 0.6 \times 9\% = 10.4\%$	>	8%	Overpriced

C. Arbitrary

D. Arbitrary

85. The expected return on the market is 12 percent with a standard deviation of 20 percent and the risk free rate is 4 percent. Which of the following portfolios are correctly priced?

Portfolio	Expected Return	Beta
1	8%	0.9
2	14%	1.2
3	16%	1.5
4	20%	2.0

A. 1 and 2 only

B. 1 and 4 only

C. 2 and 3 only

D. 3 and 4 only

Answer: D

Type: Calculation Difficulty: Medium LO: 9.3

Explanations:

A. Arbitrary

B. Arbitrary

C. Arbitrary

D. Market risk premium = $12\% - 4\% = 8\%$

Portfolio	Beta	Required Return		E(R)	
1	0.9	$4\% + 0.9 \times 8\% = 11.2\%$	>	8%	Overpriced
2	1.2	$4\% + 1.2 \times 8\% = 13.6\%$	<	14%	Underpriced
3	1.5	$4\% + 1.5 \times 8\% = 16.0\%$	=	16%	Correctly priced
4	2.0	$4\% + 2.0 \times 8\% = 20.0\%$	=	20%	Correctly priced

86. The risk free rate is 4.5 percent. The expected return on the market is 13 percent with a standard deviation of 15 percent. What is the required rate of return for Stock X if it has a beta of 1.4?

A. 16.40%

B. 18.20%

C. 20.50%

D. 22.70%

Answer: A

Type: Calculation Difficulty: Easy LO: 9.3

Explanations:

A. Required return for stock X, $r_X = 4.5\% + 1.4 \times (13\% - 4.5\%) = 16.4\%$

B. Beta of X*market return

C. Arbitrary

D. Beta of X*market return + risk free rate

87. Stock Y has a beta of 0.8 and a required rate of return of 10 percent. What is the market risk premium if the risk free rate is 5 percent?

A. 5.00%

B. 4.75%

C. 6.25%

D. 7.50%

Answer: C Type: Calculation Difficulty: Easy LO: 9.3

Explanations:

A. Stock Y return – risk free rate

B. Arbitrary

C. Market risk premium = $\frac{10\% - 5\%}{0.8} = 6.25\%$

D. (Stock Y return/Y's beta) – risk free rate

88. Stock Z has a beta of 0.9 and a required rate of return of 12 percent. What is the market expected return if the risk free rate is 5.25 percent?

A. 7.50%

B. 12.75%

C. 13.33%

D. 18.58%

Answer: B Type: Calculation Difficulty: Medium LO: 9.3

Explanations:

A. Market risk premium

B: Market risk premium = $\frac{12\% - 5.25\%}{0.9} = 7.5\%$

Market return = $7.5\% + 5.25\% = 12.75\%$

C: Stock Z return/Z's beta

D: Stock Z return/Z's beta + risk free rate

89. Stock XYZ has a beta of 1.6 and a required rate of return of 15.75 percent. What is the risk free rate if the market return is 12 percent?

A. 3.25%

B. 3.75%

C. 4.50%

D. 5.75%

Answer: D Type: Calculation Difficulty: Medium LO: 9.3

Explanations:

A. Arbitrary

B. Stock XYZ return – market return

C. Arbitrary

D. Risk free rate = $\frac{15.75\% - 12\% * 1.6}{1 - 1.6} = 5.75\%$

90. The market expected return is 14 percent with a standard deviation of 18 percent. The risk free rate is 6 percent. Security XYZ has just paid a dividend of \$1 and has a current price of \$13.95. What is the beta of Security XYZ if its dividend is expected to grow at 6 percent per year indefinitely?

A. 0.85

B. 0.90

C. 0.95

D. 1.05

Answer: C Type: Calculation Difficulty: Difficult LO: 9.3

Explanations:

A. Arbitrary

B. D_0 treated as D_1 in the computation of XYZ's return

C. Stock XYZ's expected return = $\frac{\$1 * 1.06}{\$13.95} + 6\% = 13.6\%$

Stock XYZ's beta = $\frac{13.6\% - 6\%}{14\% - 6\%} = 0.95$

D. Arbitrary

91. The market expected return is 14 percent with a standard deviation of 12 percent. The risk free rate is 5.5 percent. Security A has just paid a dividend of \$1.5, which is expected to grow at a rate of 10 percent per year indefinitely. What is the current price of Security A if it has a beta of 1.4?

A. \$9.93

B. \$10.93

C. \$20.27

D. \$22.30

Answer: D Type: Calculation Difficulty: Difficult LO: 9.3

Explanations:

A. B) and C) combined

B. Market return treated as market risk premium in the computation of A's return

C. D_0 treated as D_1 in the computation of A's current price

D. Security A's return = $5.5\% + 1.4 * (14\% - 5.5\%) = 17.4\%$

Security A's current price = $\frac{\$1.5 * (1.10)}{17.4\% - 10\%} = \$22.30$

Section 9.4 Alternative Asset Pricing Models

92. What is the main criticism of the Roll's critique?

- A. The stock market is not efficient.
- B. The CAPM does not hold because beta is not a good measure of risk.
- C. The market portfolio is impossible to estimate.
- D. The CAPM does not hold empirically.

Answer: C Type: Concept Difficulty: Medium LO: 9.4

93. Suppose the returns on Security A are linearly related to four risk factors: F1, F2, F3, and F4. The required rate of return on Security A can be determined as follows:

$E(R_A) = a_0 + b_1F_1 + b_2F_2 + b_3F_3 + b_4F_4$. The risk free rate is 4.5 percent. What is the required rate of return of Security A, where b1, b2, b3, and b4 are 0.4, 0.8, 0.6, and 0.7, respectively, and F1, F2, F3, and F4 are 5 percent, 6 percent, 10 percent, and 8 percent, respectively?

- A. 18.40%
- B. 20.60%
- C. 22.90%
- D. 24.30%

Answer: C Type: Calculation Difficulty: Medium LO: 9.4

Explanations:

- A. risk free rate not included in the computation
- B. Arbitrary
- C. Security A's required return = 4.5% + 0.4*5% + 0.8*6% + 0.6*10% + 0.7*8% = 22.90%
- D. Arbitrary

94. Which one of the following is not part of the Fama French factor model?

- A. Market portfolio
- B. Book to market value
- C. Growth of the stock
- D. Size of stock

Answer: C Type: Definition Difficulty: Easy LO: 9.4

95. Which one of the following is NOT a difference between APT and CAPM models?

- A. Risk factors
- B. Arbitrage principle
- C. Market portfolio
- D. Pricing risk

Answer: D Type: Concept Difficulty: Medium LO: 9.4

96. Suppose the returns on Security B are linearly related to four risk factors: F1, F2, F3, and F4. The required rate of return on Security B can be determined as follows:

$E(R_B) = a_0 + b_1F_1 + b_2F_2 + b_3F_3 + b_4F_4$. The risk free rate is 5 percent. What is the risk premium for F4, if the required return of Security B is 20 percent, b_1 , b_2 , b_3 , and b_4 are 0.5, 0.7, 0.6, and 0.9, respectively, and F1, F2, and F3 are 4.25 percent, 5.75 percent, and 6.5 percent, respectively?

- A. 4.95%
- B. 5.50%
- C. 7.42%
- D. 11.06%

Answer: B Type: Calculation Difficulty: Medium LO: 9.4

Explanations:

A. Same as B) except not divided by 0.9

B. Risk premium for F4 = $\frac{20\% - 5\% - 0.5 * 4.25\% - 0.7 * 5.75\% - 0.6 * 6.5\%}{0.9} = 5.5\%$

C. Arbitrary

D. Risk free rate not included in the computation

Practice Problems

97. Explain the separation theorem.

Type: Definition Level of Difficulty: Medium LO: 9.1

Suggested Answer:

The separation theorem states that the investment decision, (how to construct the portfolio of risky assets) is separate from the financing decision, (how much should be invested or borrowed in the risk-free asset). In other words, the risky portfolio is optimal for every investor regardless of his or her degree of risk aversion.

98. What is the role of the risk-free asset in the efficient portfolio?

Type: Concept Level of Difficulty: Medium LO: 9.1

Suggested Answer:

With the risk-free asset, investors can invest part of their wealth in this asset and the remainder in the risky market portfolio, resulting in a new efficient frontier. By combining the risk-free asset with a portfolio on the efficient frontier, a higher expected return can be achieved for a given risk level and a lower risk level can be achieved for a given expected return. New portfolios are possible that were not available before the risk-free asset was introduced.

99. Is it possible to invest more than 100 percent of your available funds?

Type: Concept Level of Difficulty: Medium LO: 9.1

Suggested Answer:

If investors are able to borrow funds, then they can extend the possible portfolios available to them beyond the 100 percent in the risky portfolio. These borrowed funds can be used to lever the portfolio position beyond the tangency point that represents 100 percent of an investor's wealth in the risky asset portfolio. It is important to note that risk increases as the amount of borrowing increases.

100. How do you explain a stock that earns a return higher than the required rate of return from the CAPM?

Type: Concept Level of Difficulty: Medium LO: 9.2

Suggested Answer:

The CAPM shows only the relationship between equity and the market return. There may be some other factors that are not taken in consideration like the ones shown in the Fama French model. If we believe Roll's critique, the CAPM is not empirically possible. Hence, the return that we estimate using the market return is different than what we should expect to get.

101. "There may be some truth in the CAPM, but my sister-in-law bought a stock last year that earned 20 percent return, much higher than what was expected using the CAPM." Evaluate this criticism.

Type: Concept Level of Difficulty: Difficult LO: 9.2

Suggested Answer:

The CAPM does not claim to describe the relationship between actual returns and risk. It only shows the relationship between expected returns and risk. Therefore, the criticism is not valid.

102. What is the difference between the Capital Market Line (CML) and the Security Market Line (SML)?

Type: Definition Level of Difficulty: Medium LO: 9.2

Suggested Answer:

The CML depicts the highest attainable expected return for any given risk level (measured by standard deviation). It applies only to efficient portfolios and not to individual securities. The SML represents the trade-off between market risk (measured by beta) and the required rate of return for any risky security, whether it be an individual security or a portfolio.

103. What is beta?

Type: Definition Level of Difficulty: Easy LO: 9.3

Suggested Answer:

Beta is a measure of a security's market (systematic) risk, or performance volatility that cannot be diversified away. It measures the risk of an individual security or portfolio relative to the market portfolio.

104. You have two portfolios, A and B. Portfolio A has an expected return of 20 percent and a beta of 1.4. Portfolio B has an expected return of 25 percent and a beta of 1.2. Is this scenario consistent with the CAPM? Why or why not?

Type: Concept Level of Difficulty: Medium LO: 9.2

Suggested Answer:

This is not consistent with the CAPM. The CAPM would predict that the portfolio with the higher beta should have the higher return.

105. If two stocks had the same beta, but Stock A had high unsystematic risk and Stock B had low unsystematic risk, would rational investors expect a higher return from holding one of these securities?

Type: Concept Level of Difficulty: Difficult LO: 9.2

Suggested Answer:

Rational investors would expect the same return on both Stock A and B. They should not be compensated for assuming unsystematic risk, because it can be eliminated through diversification.

106. What is the difference between CAPM and APT?

Type: Definition Level of Difficulty: Easy LO: 9.4

Suggested Answer:

The major difference between the CAPM and APT lies in the assumption used to derive the two models. CAPM requires more assumptions than APT. Moreover, APT is based on the arbitrage principle, which assumes that two assets with the same risk sensitivities should have the same return. On the other hand, CAPM is based on an equilibrium principle.

107. After you have done an extensive analysis of the economy, Stock X, and Stock Y, you make the following forecasts:

State of Economy	Probability of Occurrence	Stock X Expected Return	Stock Y Expected Return
Boom	30%	20%	-12%
Normal	45%	12%	20%
Bust	25%	-8%	30%

Suppose you plan to invest in a portfolio with 40 percent of the funds in Stock X and 60 percent in Stock Y. The market return is 12 percent with a standard deviation of 16 percent. The risk free rate is 5 percent.

- What are the expected returns of Stock X and Stock Y?
- What are the standard deviation of the returns of Stock X and Stock Y?
- What is the covariance of the returns on Stock X and Stock Y?
- What is the correlation between Stock X and Stock Y?
- What is the expected return on the portfolio?
- What is the standard deviation of the portfolio?
- What is the Sharpe ratio of the portfolio?

Type: Calculation Level of Difficulty: Medium LO: 9.1, 9.2, 9.3

Suggested Answer:

A. Expected return on Stock X = $20\% \cdot 0.3 + 12\% \cdot 0.45 + (-8\%) \cdot 0.25 = 9.4\%$

Expected return on Stock Y = $(-12\%) \cdot 0.3 + 20\% \cdot 0.45 + 30\% \cdot 0.25 = 12.9\%$

B. Standard deviation of Stock X

$$\sigma_X = \sqrt{\sum_{i=1}^3 Pr_i (r_{X,i} - 9.4\%)^2} = \sqrt{0.003371 + 0.000304 + 0.007569} = 10.60\%$$

Standard deviation of Stock Y

$$\sigma_Y = \sqrt{\sum_{i=1}^3 Pr_i (r_{Y,i} - 12.9\%)^2} = \sqrt{0.018600 + 0.002268 + 0.007310} = 16.79\%$$

C. Covariance of the returns on Stock X and Y

$$COV_{xy} = \sum_{i=1}^3 Pr_i (r_{x_i} - 9.4\%) (r_{y_i} - 12.9\%) = -0.007918 + 0.000831 - 0.007439 = -0.014526$$

D. Correlation between Stock X and Y, $\rho_{xy} = \frac{-0.014526}{10.6\% \cdot 16.79\%} = -0.8162$

E. Expected return on the portfolio, $E(R_P) = 9.4\% \cdot 0.4 + 12.9\% \cdot 0.6 = 11.5\%$

F. Standard deviation of the portfolio

$$\sigma_P = \sqrt{(0.4)^2 (10.6\%)^2 + (0.6)^2 (16.79\%)^2 + 2(0.4)(0.6)(-0.014526)} = 7.05\%$$

G. Sharpe ratio of the portfolio = $\frac{11.5\% - 5\%}{7.05\%} = 0.92$

108. Stock ABC is currently selling for \$16.72. It has just paid an annual dividend of \$0.80 per share, which is expected to grow at 4.5 percent indefinitely. The risk-free rate is 6 percent. The expected return on the market portfolio is 14 percent with a standard deviation of 17 percent.

- A. What is the expected return on Stock ABC?
 B. Is Stock ABC overpriced, underpriced, or correctly priced if it has a beta of 0.6?
 C. Is Stock ABC above, below, or on the SML?
 D. What is the equilibrium price of Stock ABC? Assume the dividend grow rate remains at 4.5 percent.

Type: Calculation Level of Difficulty: Difficult LO: 9.1, 9.2, 9.3

Suggested Answer:

A. Expected return on Stock ABC = $\frac{\$0.8 * 1.045}{\$16.72} + 4.5\% = 9.5\%$

B. Required return on Stock ABC = $6\% + 0.6 * (14\% - 6\%) = 10.8\%$
 Since Stock ABC's required return > expected return, ABC is overpriced.

C. Since Stock ABC is overpriced, it lies below the SML

D. In equilibrium, the price of Stock ABC = $\frac{\$0.8 * 1.045}{10.8\% - 4.5\%} = \$13.27$

109. The risk-free rate is 4 percent. The expected return on the market portfolio is 12 percent with a standard deviation of 16 percent. Which security is over, under, or correctly priced?

Security	P ₀	D ₁	P ₁	Beta
ABC	\$25.00	\$1.50	\$28.46	1.6
DEF	\$12.00	\$0.60	\$13.80	2.0
GHI	\$18.00	\$0.80	\$19.25	1.3

Type: Calculation Level of Difficulty: Difficult LO: 9.3

Suggested Answer:

Security	Expected Return		Required Return	
ABC	$\frac{\$1.5 + \$28.46}{\$25} - 1 = 19.84\%$	>	$4\% + 1.6(12\% - 4\%) = 16.8\%$	Underpriced
DEF	$\frac{\$0.6 + \$13.8}{\$12} - 1 = 20\%$	=	$4\% + 2(12\% - 4\%) = 20\%$	Correctly priced
GHI	$\frac{\$0.8 + \$19.25}{\$18} - 1 = 11.39\%$	<	$4\% + 1.3(12\% - 4\%) = 14.4\%$	Overpriced

110. Given the following information:

Month	Stock X Return	S&P/TSX Return
January	10%	12%
February	8%	7%
March	12%	8%
April	-5%	10%
May	-8%	-5%
June	4%	8%
July	9%	11%
August	8%	-7%
September	-4%	6%
October	6%	8%
November	3%	5%
December	2%	6%

- What are the average monthly returns on Stock X and S&P TSX?
- What are the standard deviations of the monthly returns on Stock X and S&P TSX?
- What is the covariance of the returns on Stock X and S&P TSX?
- What is the beta of Stock X?
- What is the implied risk free rate?

Type: Calculation Level of Difficulty: Medium LO: 9.1, 9.2, and 9.3

Suggested Answer:

- A. Stock X average monthly return

$$\bar{r}_X = \frac{10\% + 8\% + 12\% - 5\% - 8\% + 4\% + 9\% + 8\% - 4\% + 6\% + 3\% + 2\%}{12} = 3.75\%$$

S&P/TSX average monthly return

$$\bar{r}_M = \frac{12\% + 7\% + 8\% + 10\% - 5\% + 8\% + 11\% - 7\% + 6\% + 8\% + 5\% + 6\%}{12} = 5.75\%$$

$$\text{B. Stock X standard deviation, } \sigma_X = \sqrt{\frac{\sum_{i=1}^{12} (r_{X,i} - 3.75\%)^2}{12 - 1}} = \sqrt{\frac{0.045425}{11}} = \sqrt{0.004130} = 6.43\%$$

$$\text{S\&P/TSX standard deviation, } \sigma_M = \sqrt{\frac{\sum_{i=1}^{12} (r_{M,i} - 5.75\%)^2}{12 - 1}} = \sqrt{\frac{0.038025}{11}} = \sqrt{0.003457} = 5.88\%$$

- C. Covariance of returns on Stock X and S&P TSX

$$COV_{X,M} = \frac{\sum_{i=1}^{12} (r_{X,i} - 3.75\%)(r_{M,i} - 5.75\%)}{12 - 1} = 0.001175$$

$$\text{D. Beta of stock X, } \beta_X = \frac{0.001175}{0.003457} = 0.3399$$

E. The implied risk free rate = $\frac{3.75\% - 0.3399 * 5.75\%}{1 - 0.3399} = 2.72\%$

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Chapter 10: Market Efficiency

Multiple Choice Questions

Section 10.1 The Importance of Market Efficiency

1. What does operational efficiency refer to?
 - A. Prices that quickly reflect important information.
 - B. Low transaction costs.
 - C. Sufficient securities to efficiently allocate risk
 - D. Both A and B are correct.Answer: B Type: Definition Difficulty: Easy LO: 10.1

2. What does informational efficiency refer to?
 - A. Cheap information costs.
 - B. Prices that quickly reflect important information.
 - C. Low number of transactions.
 - D. Both A and B are correct.Answer: B Type: Definition Difficulty: Easy LO: 10.1

3. The Kumquat Exchange is characterized by high transaction costs and very infrequent trading. This exchange is likely to have:
 - A. Information efficiency and operational efficiency
 - B. Information inefficiency and operational efficiency
 - C. Information efficiency and operational inefficiency
 - D. Information inefficiency and operational inefficiencyAnswer: D Type: Concept Difficulty: Medium LO: 10.1

4. In many emerging markets, stock exchanges do not have big capitalizations. This refers to which type of inefficiency?
 - A. Operational efficiency
 - B. Allocational efficiency
 - C. Information efficiency
 - D. Liquidity efficiencyAnswer: B Type: Concept Difficulty: Medium LO: 10.1

5. Which one of the following is NOT an example of market efficiency?
 - A. Stock price changes after earning announcements.
 - B. Stock price increases every third day by an increase of a 1% from the opening price.
 - C. Stock price has a beta of 1.
 - D. Stock price decreases when the market goes up.Answer: B Type: Concept Difficulty: Difficult LO: 10.1

6. Prices of securities trading on The Grenadines Exchange react rapidly to information; however, firms listed on the exchange cannot completely hedge their risks. The Grenadines Exchange is likely to have:
- A. Information efficiency and allocational efficiency
 - B. Information inefficiency and allocational efficiency
 - C. Information efficiency and allocational inefficiency
 - D. Information inefficiency and allocational inefficiency
- Answer: C Type: Concept Difficulty: Medium LO: 10.1

Section 10.2 Defining Market Efficiency

7. Which of the following is **NOT** an underlying assumption of the existence of an efficient market?
- A. A large number of rational, profit-maximizing investors exist.
 - B. Information is costless and widely available to market participants.
 - C. Information arrives at predetermined times.
 - D. Investors react quickly and fully to new information.
- Answer: C Type: Definition Difficulty: Easy LO: 10.2
8. Use the following statements to answer the question:
- I. Increasing disclosure of information about the firm enhances transparency in the market.
 - II. Disclosure enhances the understanding of a firm's action hence it increases the efficiency of the market.
- A. I is incorrect, II is correct
 - B. I is correct, II is incorrect
 - C. I and II are incorrect
 - D. I and II are correct
- Answer: D Type: Concept Difficulty: Medium LO: 10.2
9. What does the concept of an efficient market imply?
- A. All shares of stock have the same expected returns.
 - B. Selecting stocks by throwing darts at a page of stocks prices will yield the same return as a carefully selected portfolio.
 - C. Prices reflect all available information.
 - D. Stock prices do not fluctuate.
- Answer: C Type: Definition Difficulty: Easy LO: 10.2

10. According to John Keynes, what do small investors' reactions in the financial market increase?

- A. Allocational inefficiency
- B. Liquidity constraints
- C. Market inefficiency
- D. Excessive volatility

Answer: C Type: Concept Difficulty: Medium LO: 10.2

Section 10.3 The Efficient Markets Hypothesis (EMH)

11. If markets were strong form efficient, which of the following situations would yield abnormal returns?

- A. Analyzing a company's earnings report.
- B. Identifying a pattern in a company's stock price
- C. Obtaining insider information.
- D. None of the above would yield abnormal returns.

Answer: D Type: Definition Difficulty: Easy LO: 10.3

12. If markets were semi-strong form efficient, which of the following situations would yield abnormal returns?

- A. Analyzing a company's earnings report.
- B. Identifying a pattern in a company's stock price.
- C. Obtaining insider information.
- D. None of the above would yield abnormal returns.

Answer: C Type: Definition Difficulty: Easy LO: 10.3

13. How are abnormal returns defined?

- A. Returns in excess of the market return
- B. Returns in excess of the initial investment
- C. Returns in excess of the risk adjusted expected return
- D. Positive return

Answer: C Type: Definition Difficulty: Medium LO: 10.3

14. If markets were weak form efficient, which of the following situations would **NOT** yield abnormal returns?

- A. Analyzing a company's earnings report.
- B. Identifying a pattern in a company's stock price.
- C. Obtaining insider information.
- D. All of the above would yield abnormal returns.

Answer: B Type: Definition Difficulty: Easy LO: 10.3

15. The price of a certain stock rises every Monday and falls every Thursday. Which form of efficiency is contradicted?

- A. Weak form
- B. Semi-strong form
- C. Strong form
- D. No form of efficiency is contradicted

Answer: A Type: Concept Difficulty: Easy LO: 10.3

16. A senior manager can consistently earn excess profits by trading her company's stock. Which form of efficiency is contradicted?

- A. Weak form
- B. Semi-strong form
- C. Strong form
- D. No form of efficiency is contradicted

Answer: C Type: Concept Difficulty: Easy LO: 10.3

17. An investor can consistently make excess profits by following the advice provided on the Financial Guru public website. Which form of efficiency is contradicted?

- A. Weak form
- B. Semi-strong form
- C. Strong form
- D. No form of efficiency is contradicted

Answer: B Type: Concept Difficulty: Easy LO: 10.3

18. The announcement of a large long-term project causes the stock price to rise 10 percent two days before the announcement takes place. Which form of efficiency is contradicted?

- A. Weak form
- B. Semi-strong form
- C. Strong form
- D. No form of efficiency is contradicted

Answer: C Type: Concept Difficulty: Easy LO: 10.3

19. The announcement of the sudden accidental death of the CEO and principal scientist of a corporation is associated with a 12% decrease in the company's stock price. Which form of market efficiency is contradicted?

- A. Weak form
- B. Semi-strong form
- C. Strong form
- D. No form of efficiency is contradicted

Answer: D Type: Concept Difficulty: Easy LO: 10.3

20. Technical analysis, which is defined as the analysis of historical trends of prices, is an important field in finance. Which form of efficiency is this field based on?

- A. Weak form inefficiency
- B. Semi-strong form inefficiency
- C. Strong form inefficiency
- D. It has nothing to do with efficiency

Answer: A Type: Concept Difficulty: Medium LO: 10.3

21. Which of the following is **FALSE**? Market efficiency implies:

- A. new information disseminates quickly.
- B. investors can take advantage of temporary time lags in information dissemination.
- C. new information is instantly reflected in share prices.
- D. the prices of securities are considered “right” at any time given their risk profile.

Answer: B Type: Concept Difficulty: Medium LO: 10.3

22. Which of the following is **NOT** true about the efficient market hypothesis?

- A. Market prices reflect all available information at any given time.
- B. Market prices do not fluctuate dramatically.
- C. Market prices are considered fair.
- D. Investors cannot continuously earn an excess return over and above the risk-adjusted return.

Answer: B Type: Concept Difficulty: Medium LO: 10.3

23. The Andrews Sisters Music Corp has just released its financial statements showing an unexpectedly high earnings number. We observe that the stock price of the company does not respond. This observation is consistent with:

- A. Semi-strong form market efficiency
- B. Semi-strong form market inefficiency
- C. Strong form market efficiency
- D. Strong form market inefficiency

Answer: B Type: Concept Difficulty: Medium LO: 10.3

24. You have observed that every time Toronto Skaters’ Corp. stock falls by 2% in one week, it rises by 8% the next week. What is this observation is consistent with?

- A. Semi-strong form market efficiency
- B. Semi-strong form market inefficiency
- C. Weak form market efficiency
- D. Weak form market inefficiency

Answer: D Type: Concept Difficulty: Medium LO: 10.3

25. Which of the following statements is a violation of semi-strong form market efficiency?

- I. Executives trade their stock holdings before major announcements.
- II. Day traders base their trading decisions on daily, weekly and monthly trends.

- A. I only
- B. II only
- C. Both I and II
- D. Neither of these statements

Answer: D Type: Concept Difficulty: Difficult LO: 10.3

26. A university professor is researching the impact of non-public information on the marketplace. She finds that investors who do have access to material, non-public information are consistently earning above-average risk-adjusted returns, and that the market price of the targeted securities are partially reflecting the new information. This is a violation of:

- I. Strong form market efficiency
- II. Semi-strong market efficiency
- III. Weak form market efficiency

- A. I. only
- B. I and II
- C. I and III
- D. II and III

Answer: A Type: Concept Difficulty: Medium LO: 10.3

27. You purchased shares of a company in the automotive industry a year ago. Over the course of the last year, the economy began to slow down and the company faced declining sales. As a result, the stock price declined over your holding period. Which of the following is true?

- A. This is a violation of strong form market efficiency.
- B. This is a violation of semi-strong form market efficiency.
- C. This is a violation of weak form market efficiency.
- D. This is not a violation of the efficient market hypothesis.

Answer: D Type: Concept Difficulty: Difficult LO: 10.3

28. If security markets are efficient, then:

- A. the net present value of all securities should be positive.
- B. the net present value of all securities should be zero.
- C. the net present value of all securities should be negative.
- D. there are no implications on the net present value of securities.

Answer: B Type: Concept Difficulty: Difficult LO: 10.3

Section 10.4 Empirical Evidence Regarding Market Efficiency

29. The random walk theory suggests:

- A. All stocks have an expected return of zero.
- B. Stock price changes are random.
- C. Stock prices are random.
- D. Diversification is pointless.

Answer: B Type: Definition Difficulty: Easy LO: 10.4

30. The statement that “stock prices follow a random walk” implies that:

- A. stock prices are unpredictable.
- B. the best estimate of tomorrow’s stock price is today’s price.
- C. stock prices follow a chaotic process.
- D. the best estimate of tomorrow’s return is today’s return.

Answer: B Type: Definition Difficulty: Medium LO: 10.4

31. If information does **not** arrive randomly and the market rapidly and accurately adjusts to any new information, stock prices will

- A. follow a random walk.
- B. not follow a random walk.
- C. behave in a deterministic manner.
- D. behave in a completely random manner.

Answer: B Type: Concept Difficulty: Difficult LO: 10.4

32. Which one of the following is NOT a market anomaly?

- A. Monday effect
- B. January effect
- C. Internet bubble
- D. Unexpected earning spikes

Answer: D Type: Concept Difficulty: Medium LO: 10.4

33. Jane Wong has developed a technical trading rule that has consistently made a risk adjusted return of 15% per month for the last 10 years. This is evidence of:

- A. Semi-strong form efficiency
- B. Semi-strong form inefficiency
- C. Weak-form efficiency
- D. Weak-form inefficiency

Answer: D Type: Concept Difficulty: Easy LO: 10.4

34. Jimmy Khan has developed a trading rule where he buys firms with relatively high dividend yields. This trading rule has consistently earned a risk adjusted return of 15% per month for the last 10 years. This is evidence of:

- A. Semi-strong form efficiency
- B. Semi-strong form inefficiency
- C. Weak-form efficiency
- D. Weak-form inefficiency

Answer: B Type: Concept Difficulty: Easy LO: 10.4

35. Melanie has observed that stocks that have earned high returns over the last year tend to earn high returns over the next year. She has also observed that stocks that earned low returns over the last year tended to earn low returns over the next year. This is an example of:

- A. The January effect
- B. Mean reversion in stock prices
- C. Stock price momentum
- D. Size effect

Answer: C Type: Definition Difficulty: Easy LO: 10.4

36. Ahmed developed a trading strategy based on historical prices that would give him an excess risk adjusted return of 1.5% per trade. However, when he implemented his strategy, he noticed that the transaction costs were about 2%. Which form of market efficiency does this example show?

- A. Operational inefficiency
- B. Strong form efficiency
- C. Allocational inefficiency
- D. Weak-form efficiency

Answer: D Type: Concept Difficulty: Medium LO: 10.4

37. Empirical support for market efficiency is strongest for:

- A. Weak form
- B. Semi-strong form
- C. Strong form
- D. No form of market efficiency is supported by the data

Answer: A Type: Concept Difficulty: Easy LO: 10.4

38. Michel has developed a trading strategy for the Abitibi-Témiscamingue Market. He has observed that his strategy earns returns that are statistically significantly greater than the market. Should Michel start applying his trading strategy?
- A. Yes, the tests show that its returns are statistically significantly greater than the market.
 - B. Not necessarily, the tests show that its returns are statistically significantly greater than the market.
 - C. Yes, the tests show that its returns are economically significantly greater than the market.
 - D. Not necessarily, the tests do not show whether the returns are economically significantly greater than the market.

Answer: D Type: Concept Difficulty: Medium LO: 10.4

Section 10.6 Implications of Market Efficiency

39. If markets were strong form efficient, which of the following situations would yield abnormal returns?
- A. Analyzing a company's earnings report
 - B. Identifying a pattern in a company's stock price
 - C. Obtaining insider information
 - D. None of the above

Answer: D Type: Definition Difficulty: Easy LO: 10.6

40. Use the following statements to answer this question:
- I. Strong form efficiency is practically impossible to prove
 - II. On average, you can make money using technical analysis
 - III. Market efficiency is a myth that does not exist in any of its forms.
- A. I, II, and III are correct
 - B. I, II, and III are incorrect
 - C. I and II are correct and III is incorrect
 - D. I is correct, II and III are incorrect

Answer: D Type: Concept Difficulty: Medium LO: 10.6

41. Which of the following is **NOT** an implication of the Efficient Markets Hypothesis for corporate financial officers?
- A. They should ignore dramatic changes in their company's stock price.
 - B. There is no point in timing the issue of new securities.
 - C. It does not make sense to "play" interest rates by rolling over short-term debt until long-term rates fall.
 - D. There is no point in timing stock repurchases in an efficient market

Answer: A Type: Concept Difficulty: Medium LO: 10.6

45. Liam, the manager of the Snoring Gryphon, your local Irish pub, is very confused. He has observed that stock of the Gryphon earns higher returns in January than in March. He expected the stock to do better around St. Patrick's Day when the pub's sales are the highest. Explain these two observations to Liam.

Type: Concept

Difficulty: Difficult

LO: 10.3

Suggested Answer:

The St. Patrick's Day non-effect: as the increased sales in an Irish pub on St. Patrick's Day are predictable, the stock price should not react. Rational investors will anticipate the increased sales and price the stock accordingly. We would expect to see a stock price reaction to an unexpected change in sales (e.g. The Snoring Gryphon had unusually low sales on St. Patrick's Day). The January effect is a possible explanation for the higher returns in January. We know that, on average, the stock returns, especially of smaller firms, are higher in January.

Answer

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Chapter 11: Forwards, Futures and Swaps

Multiple Choice Questions

Section 11.1 Forward Contracts

1. A tailor-made contract with a price that is established today for future delivery is called a

- _____.
- A. futures contract
 - B. forward contract
 - C. spot contract
 - D. call option

Answer: B Type: Definition Difficulty: Easy LO: 11.1

2. Forward contracts:

- A. trade in an open market.
- B. establish a price paid tomorrow for something today.
- C. offer delivery of a commodity by sellers in the future.
- D. are traded on OTC markets.

Answer: D Type: Definition Difficulty: Easy LO: 11.1

3. What condition is necessary to create a synthetic forward contract?

- A. A hedging position.
- B. Exposure to changes in exchange rates
- C. Interest rate parity
- D. Speculating in the market

Answer: C Type: Concept Difficulty: Easy LO: 11.1

4. Which of the following carries storage costs?

- A. Futures on stocks
- B. Futures on exchange rates
- C. Futures on commodities
- D. Futures on interest rates

Answer: C Type: Definition Difficulty: Easy LO: 11.1

5. Profit from a long position in a forward:

- A. $(X - S_T)$
- B. $[S_T - F] \times n$
- C. $(S_T - X)$
- D. $[F - S_T] \times n$

Answer: B Type: Definition Difficulty: Easy LO: 11.1

6. Graph a short position in a forward contract:

I

II

III

IV

- A. I
- B. II
- C. III
- D. IV

Answer: C Type: Definition Difficulty: Medium LO: 11.1

7. When does counter party risk arise?

- A. When the spot price increases.
- B. When the investor takes a naked position.
- C. When the speculator loses to the counter party.
- D. When the counter party defaults.

Answer: D Type: Definition Difficulty: Easy LO: 11.1

8. Marie has done some research and found that the spot rate is C\$1.4039 per euro. Her neighbour told her that the three month forward rate is C\$1.44 per euro. If Marie assumes a euro 1,000 long position in the forward contract what will be her profit (loss) if the spot rate in 3 months is C\$1.45 per euro?

- A. 46.10
- B. 10.00
- C. -10.00
- D. 36.10

Answer: B Type: Calculation Difficulty: Easy LO: 11.1

How each option was determined:

- A. 46.10 $(S_T - S_0) \times n = (1.45 - 1.4039) 1000 = 46.10$
- B. 10.00 $(S_T - F) \times n = (1.45 - 1.44) 1000 = 10$
- C. -10.00 $(F - S_T) \times n = (1.44 - 1.45) 1000 = -10$
- D. 36.10 $(F - S_0) \times n = (1.44 - 1.4039) 1000 = 36.10$

9. The six month forward rate is C\$ 1.00 per US\$. Ahmed assumes a 1,000 long position in the forward contract and his profit in six months is C\$30.00. What is the spot rate in six months?

- A. C\$ 1.030 per US\$
- B. C\$ 1.031 per US\$
- C. C\$ 1.029 per US\$
- D. C\$ 0.970 per US\$

Answer: A Type: Calculation Difficulty: Medium LO: 11.1

How each option was determined:

- A. C\$ 1.030 per US\$ $S_T = (\text{Profit}/n) + F = (30/1000) + 1.00 = 1.030$
- B. C\$ 1.031 per US\$ $S_T = (\text{Profit} + F) / n + 1 = (30 + 1.00) / 1000 + 1.00 = 1.031$
- C. C\$ 1.029 per US\$ $S_T = (\text{Profit} - F) / n + 1 = (30 - 1.00) / 1000 + 1.00 = 1.029$
- D. C\$ 0.970 per US\$ $S_T = F - (\text{Profit}/n) = 1.00 - (30/1000) = 0.970$

10. What is the “cost of carry” equivalent for exchange rates?

- A. The forward rate

- B. The interest rate on the host country
- C. The interest rate on the foreign country
- D. The interest rate difference between host and foreign countries

Answer: D Type: Concept Difficulty: Difficult LO: 11.1

11. Magdalena assumes a US\$ 2,000 short position in a 1-year US forward contract ($F = \text{C\$}1.0312$ per US). If the spot rate in one year is (a) C\$1.04 per US (b) C\$1.03 per US, what will her profit (loss) be in each case?

- A. -8.8, 1.2
- B. 20, 2.4
- C. 17.6, -2.4
- D. -17.6, 2.4

Answer: D Type: Calculation Difficulty: Medium LO: 11.1

How each option was determined:

- A. $(F - S_T) n = (1.0312 - 1.04) 1000 = -8.8$; $(F - S_T) n = (1.0312 - 1.03) 1000 = 1.2$
- B. $(S_T - S_T) n = (1.04 - 1.03) 2000 = 20$; $(F - S_T) n = (1.0312 - 1.03) 2000 = 2.4$
- C. $(S_T - F) n = (1.04 - 1.0312) 2000 = 17.6$; $(S_T - F) n = (1.03 - 1.0312) 2000 = -2.4$
- D. $(F - S_T) n = (1.0312 - 1.04) 2000 = -17.6$; $(F - S_T) n = (1.0312 - 1.03) 2000 = 2.4$

12. Assume perfect foresight. The current spot rate is C\$2.037 per British pound. The 3-month forward rate is C\$2.0383. The spot rate in three months will be C\$2.04 per pound. What position must an investor assume in order to make a profit of \$17.00?

- A. Pound 13,077 short position
- B. Pound 10,000 long position
- C. Pound 10,000 short position
- D. Pound 13,077 long position

Answer: B Type: Calculation Difficulty: Easy LO: 11.1

How each option was determined:

- A. Pound 13,077 short position $n = \text{Profit} / (S_0 - F) = 17 / (2.037 - 2.0383)$
- B. Pound 10,000 long position $n = \text{Profit} / (S_T - F) = 17 / (2.04 - 2.0383)$
- C. Pound 10,000 short position $n = \text{Profit} / (F - S_T) = 17 / (2.0383 - 2.04)$
- D. Pound 13,077 long position $n = \text{Profit} / (F - S_0) = 17 / (2.0383 - 2.037)$

13. Suppose a Montreal Import company has to pay a foreign supplier 400,000 euros in one year and decides to hedge their position by entering into a forward contract. What is the appropriate forward position?

- A. 400,000 short euro forward contract
- B. 200,000 euro forward contract
- C. 400,000 long euro forward contract
- D. not enough information provided to identify an answer

Answer: C Type: Calculation Difficulty: Medium LO: 11.1

14. Given: the future Spot Rate C\$0.00965 per yen; the current Spot Rate C\$0.0088 per yen and the Forward Rate C\$0.009721 per yen. Determine the cost (proceeds) in Canadian dollars to eliminate foreign exchange exposure for 100,000 yen to be paid to a foreign supplier.

- A. Cost C\$965.00
- B. Cost C\$880.00
- C. Cost C\$972.10
- D. Proceeds C\$880.00

Answer: C Type: Calculation Difficulty: Medium LO: 11.1

How each option was determined:

- A. Cost C\$965.00 $n \times S_T = 100,000 \times 0.00965 = 965.00$
- B. Cost C\$880.00 $n \times S_0 = 100,000 \times 0.0088 = 880.00$
- C. Cost C\$972.10 $n \times F = 100,000 \times 0.009721 = 972.10$
- D. Proceeds C\$880.00 $n \times S_0 = 100,000 \times 0.0088 = 880.00$

15. Assume the spot exchange rate today is C\$1.02 per 1 USD, while the three-month forward rate is C\$1.06 per USD. What will be the profit for an investor who takes a 100,000-USD short position in the forward contract if the spot rate in three months equals 1.05?

- A. 1000
- B. -1000
- C. 4000
- D. -4000

Answer: A Type: Calculation Difficulty: Medium LO: 11.1

How each option was determined:

- A. $(1.06 - 1.05) \times 100,000 = 1000$
- B. $(1.05 - 1.06) \times 100,000 = -1000$
- C. $(1.02 - 1.06) \times 100,000 = -4000$
- D. $(1.06 - 1.02) \times 100,000 = 4000$

16. Xin is selling his transformer over the internet for C\$500.00. An interested buyer says he is willing to pay 360 euro in six months. What position should Xin take to eliminate his foreign exchange exposure?

- A. 500 long Canadian forward contract
- B. 500 short Canadian forward contract
- C. 360 long euro forward contract
- D. 360 short euro forward contract

Answer: D Type: Calculation Difficulty: Easy LO: 11.1

17. Assume the following: Current Spot Rate C\$1.10 per \$US; Future Spot Rate C\$1.1063 per \$US; Forward Rate C\$1.1044 per \$US; Exposure \$100,000 US. What are the profits in Canadian dollars of covering the long position?

- A. 110,000
- B. 110,630
- C. 110,440
- D. 190

Answer: D Type: Calculation Difficulty: Medium LO: 11.1

How each option was determined:

- A. 110,000 $S_0 \times n = 1.10 \times 100,000 = 110,000$
- B. 110,630 $S_T \times n = 1.1063 \times 100,000 = 110,630$
- C. 110,440 $F \times n = 1.1044 \times 100,000 = 110,440$

D. 190 $(S_T - F) * n = (1.1063 - 1.1044) * 100,000 = 190$

18. Assume the following: Current 1-year Japanese interest rate 3.0%; Current 1-year Canadian interest rate 5.0%; Current spot rate C\$0.01 per yen. Estimate the 1-year forward exchange rate using the interest rate parity.

- A. C\$0.0102 per year
- B. C\$0.0098 per year
- C. C\$1.0194 per year
- D. C\$0.9810 per year

Answer: A Type: Calculation Difficulty: Medium LO: 11.1

How each option was determined:

- A. C\$0.0102 per year $F = S \times (1 + K_D) / (1 + K_F) = 0.01 \times (1.05) / 1.03$
- B. C\$0.0098 per year $F = S \times (1 + K_F) / (1 + K_D) = 0.01 \times (1.03) / 1.05$
- C. C\$1.0194 per year $F = (1 + K_D) / (1 + K_F) = 1.05 / 1.03$
- D. C\$0.9810 per year $F = (1 + K_F) / (1 + K_D) = 1.03 / 1.05$

19. David estimated a six-month forward rate of C\$1.01 per US\$. The six-month US\$ interest rate is currently 4%. If David's estimate is based on IRP, what was the observed current six-month Canadian interest rate, if the spot rate is 1.02?

- A. 5.03%
- B. 2.03%
- C. 2.98%
- D. 2.05%

Answer: C Type: Calculation Difficulty: Difficult LO: 11.1

How each option was determined:

- A. 5.03% $K_D = [S \times (1 + K_F) / F] - 1 = [(1.02 * 1.04) / 1.01] - 1$
- B. 2.03% $K_D = [F \times (1 + K_F) / S] + 1 = [(1.01 * 1.04) / 1.02] + 1$
- C. 2.98% $K_D = [F \times (1 + K_F) / S] - 1 = [(1.01 * 1.04) / 1.02] - 1$
- D. 2.05% $K_D = [S \times (1 + K_F) / F] + 1 = [(1.02 * 1.04) / 1.01] + 1$

20. Montreal First bank is selling forward contracts on the USD/CAD exchange rate. What exchange rate would they require for a three month forward rate, if the spot rate is C\$ 1.0200/USD and the interest rates are 3% and 2.5% in Canada and the US respectively? .

- A. 1.02498
- B. 1.02127
- C. 1.01873
- D. 1.0200

Answer: B Type: Calculation Difficulty: Difficult LO: 11.1

How each option was determined:

A. $1.0200 \times 1 + 3\% \times 1 + 2.5\% = 1.02498$

$$1.0200 \times \left(\frac{\frac{1+2.5\%}{4}}{\frac{1+3\%}{4}} \right) = 1.01874$$

C.

D. 1.0200

21. Montreal First bank is selling forward contracts on the CAD/USD exchange rate. What exchange rate will they require for a three month forward rate, if the spot rate is C\$0.9800/USD, and the interest rates are 3% and 2.5% in Canada and the US respectively?

A. 0.9752

B. 0.9788

C. 0.9812

D. 0.9800

Answer: B Type: Calculation Difficulty: Difficult LO: 11.1

How each option was determined:

$$0.98 \times \left(\frac{\frac{1+2.5\%}{4}}{\frac{1+3\%}{4}} \right) = 0.9788$$

$$0.98 \times \left(\frac{\frac{1+3\%}{4}}{\frac{1+2.5\%}{4}} \right) = 0.9812$$

C.

22. Which of the following refers to the cost or benefits from a forward position in a storable commodity?

I. storage cost

II. convenience yield

III. cost of carry

A. I, II, III

B. I, II

C. II, III

D. I, III

Answer: A Type: Definition Difficulty: Medium LO: 11.1

23. By definition LIBOR is the

- A. Long term Inter-Bank Option Rate
- B. London Inter-Bank Optimal Rate
- C. Limited Inter-Bank Offer Rate
- D. London Inter-Bank Offered Rate

Answer: D Type: Definition Difficulty: Medium LO: 11.1

24. Assume the following: underlying asset spot \$200, storage cost \$20 and financing costs 5% per year. Calculate the cost of carry.

- A. \$20
- B. 0.15
- C. 0.105
- D. 0.10

Answer: B Type: Calculation Difficulty: Medium LO: 11.1

How each option was determined:

- A. \$20 Storage cost only
- B. 0.15 $C = [(K*S) + \text{storage}] / S = [(0.05*200) + 20] / 200$
- C. 0.105 $C = \text{Storage} (1 + K) / S = 20 (1.05)/200$
- D. 0.10 $C = \text{Storage} / S = 20 / 200$

25. Wheat is selling for \$25 spot. Storage costs are \$2 for the year, financing costs are 5% per year. What is the forward price for a one-year forward contract for wheat?

- A. \$25.00
- B. \$26.25
- C. \$25.13
- D. \$28.25

Answer: D Type: Calculation Difficulty: Difficult LO: 11.1

How each option was determined:

- A. \$25.00 $F = S = 25$
- B. \$26.25 $F = S * (1 + \text{financing}) = 25 * 1.05$
- C. \$25.13 $C = [(0.05*25) + 2] / 25; F = S + C$
- D. \$28.25 $C = [(0.05*25) + 2] / 25; F = S (1 + C)$

Section 11.2 Futures Contracts

26. What is a relatively small (in terms of the contract value) deposit made with the clearing house?

- A. maintenance margin
- B. margin call
- C. initial margin
- D. daily resettlement

Answer: C Type: Definition Difficulty: Medium LO: 11.2

27. The dollar amount upon which a contract is valued is referred to as:

- A. settlement price
- B. initial margin
- C. strike price
- D. notional amount

Answer: D Type: Definition Difficulty: Easy LO: 11.2

28. Which of the following are classified as commodities for the purpose of futures contracts?

- I. Silver
- II. Wheat
- III. Weather derivatives

- A. I, II
- B. II, III
- C. I, III
- D. I, II, III

Answer: A Type: Definition Difficulty: Easy LO: 11.2

29. Use the following statements to answer this question:

- I. Forward contracts are more affected with credit risk than future contracts.
- II. Clearing houses improve the level of risk associated with futures transactions.

- A. I and II are correct
- B. I and II are incorrect
- C. I is correct and II is incorrect
- D. I is incorrect and II is correct

Answer: A Type: Concept Difficulty: Medium LO: 11.2

30. Open interest refers to:

- A. the number of long contracts
- B. the number of long plus short contracts
- C. the number of long minus short contracts
- D. the number of transactions recorded with the exchange

Answer: A Type: Definition Difficulty: Medium LO: 11.2

31. An investor enters into a long position in 10,000 futures contracts of oil with a \$50,000 initial margin and has a maintenance margin that is 75 percent of this amount. The futures price associated with this contract is \$100. Assume the price of the underlying asset decreases to \$98, what is the margin call?

- A. \$50,000
- B. \$37,500
- C. \$7,500
- D. No margin required

Answer: C Type: Calculation Difficulty: Difficult LO: 11.2

How each option was determined:

- A. Initial margin
- B. $75\% \times 50000 = \$37,500$
- C. $(50000 \times .75) - [(50000 - (100 - 98) \times 1000)] = \$7,500$

32. LONG SHORT
 A – 1 F – 2
 B – 1 G – 3
 C – 2
 D – 1

What is the open interest in the market above?

- A. 5
 B. 10
 C. 0

D. more information required

Answer: A Type: Calculation Difficulty: Easy LO: 11.2

How each option was determined:

- A. sum of long or sum of short
 B. long plus short
 C. long minus short
 D. more information required

33. Future Characteristics includes

- I. traded on an exchange
 II. settled on maturity date
 III. initial margin and maintenance margin required
 IV. standardized contracts

- A. I, II, III, IV
 B. II, III, IV
 C. I, III, IV
 D. I, II, III, IV

Answer: C Type: Definition Difficulty: Medium LO: 11.2

Section 11.3 Swaps

34. A “fixed for floating” interest rate swap is also referred to as:

- A. plain vanilla
 B. fixed swap
 C. currency swap
 D. plain swap

Answer: A Type: Definition Difficulty: Easy LO: 11.3

35. Use the following statements to answer this question:

- I. Credit default swaps (CDS) are insurance on the default of issuers of the debt.
 II. The CDS market is heavily regulated to limit excessive exposure to risk.

- A. I is correct, II is incorrect
 B. I and II are correct
 C. I and II are incorrect
 D. I is incorrect, and II is correct

Answer: A Type: Concept Difficulty: Medium LO: 11.3

36. An exchange of an interest rate return for the total return on an equity index, plus or minus a spread is called a(n)

- A. total return swap
- B. interest rate swap
- C. currency swap
- D. return forward

Answer: A Type: Definition Difficulty: Medium LO: 11.3

Section Appendix 11A Forward Interest Rates and Forward Rate Agreements (FRAs)

37. The interest rate parity formula can be written as

- I. $(1 + c) = (1 + K_{\text{foreign}}) / (1 + K_{\text{domestic}})$
- II. $(1 + K_{\text{foreign}}) (1 + K_{\text{domestic}}) = (1 + c)$
- III. $(1 + c) (1 + K_{\text{domestic}}) = (1 + K_{\text{foreign}})$
- IV. $(1 + c) - (1 + K_{\text{domestic}}) = (1 + K_{\text{foreign}})$

- A. II
- B. III
- C. I
- D. IV

Answer: C Type: Definition Difficulty: Medium Section: Appendix 11A

38. In order to estimate the forward rate for year six one needs

- I. 5-year zero
- II. 6-year zero
- III. 4-year zero
- A. I, III
- B. I, II, III
- C. I, II
- D. II, III

Answer: C Type: Definition Difficulty: Easy Section: Appendix 11A

39. Find the one-year forward rate for year four given the following zero coupon rates:

Maturity	Rate
One year	2.00 %
Two year	2.75 %
Three year	3.25 %
Four year	3.65 %

- A. 3.51%
- B. 4.26%
- C. 4.86%
- D. 4.56%

Answer: C Type: Calculation Difficulty: Difficult Section: Appendix 11A

How each option was determined:

A. $1 + 2.75\% \times 2 + 2.00\% - 1 = 3.51\%$

B. $1 + 3.25\% \times 3 + 2.75\% \times 2 - 1 = 4.26\%$

C. $1 + 3.65\% \times 4 + 3.25\% \times 3 - 1 = 4.86\%$

D. $1 + 3.65\% \times 4 + 3.25\% \times 2 - 1 = 4.56\%$

40. Estimate the year 1 forward rate given:

2 year zero will earn 3%

1 year zero will earn 2.5%

A. 2.0%

B. 0.5%

C. 3.5%

D. -3.4%

Answer: C Type: Calculation Difficulty: Medium Section: Appendix 11A

How each option was determined:

A. $F = (1 + 0.025) - (0.03 - 0.025) - 1 = 0.02$

B. $F = (1 + 0.3) / (1 + 0.025) - 1 = 0.004878$

C. $F = (1 + R_t)^t / (1 + R_{t-1})^{t-1} - 1 = 0.035$

D. $F = (1 + R_{t-1})^{t-1} / (1 + R_t)^t - 1 = -0.0338$

41. Francis enters into an FRA with the local bank. The current one year forward rate is 4%. If the yield on a one year T-Bill in one year is 3.5%, what payment will be made to settle the agreement?

A. Matthew would pay the bank 0.5%

B. Matthew will use the market rate rather than the FRA rate

C. The bank would pay Matthew 0.5%

D. Matthew would not exercise his option

Answer: A Type: Definition Difficulty: Medium Section: Appendix 11A

Explanation:

A. As the actual T-bill rate in one year is less than the 4% of Matthew's contract, he pays the bank the difference (0.5%).

Practice Problems

42. Nanci enters into a long position in 6,000 futures contracts that require \$6,000 initial margin and has a maintenance margin that is 75% of this amount. The futures price associated with this contract is \$10. Assume that the spot price of the underlying asset closes at the following prices for the next five days: \$10.50, \$10.75, \$11.00, \$9.75 and \$9.25. Estimate the daily profit (loss) for Nanci as well as her equity position. (Assume no cash deposits or withdrawals are made from the account.)

Type: Calculation

Level: Medium

LO: 11.2

Suggested answer:

Day	Spot	Daily Profit	Equity Position
0	10.00	-	\$6,000
1	10.50	$(10.5 - 10) \times 6000 = 3000$	$6000 + 3000 = \$9,000$
2	10.75	$(10.75 - 10.5) \times 6000 = 1500$	$1500 + 9000 = \$10,500$
3	11.00	$(11 - 10.75) \times 6000 = 1500$	$1500 + 10500 = \$12,000$
4	9.75	$(9.75 - 11.00) \times 6000 = -7500$	$-7500 + 12000 = \$4,500$
5	9.25	$(9.25 - 9.75) \times 6000 = -3000$	$-3000 + 4500 = \$1,500$

43. An investor enters a short position worth \$10,000 in futures contracts that require a maintenance margin that is 50% of this amount. The spot price of the underlying asset closes at the following prices for the next five days: \$20.50, \$20.75, \$21.00, \$20.75 and \$20.00, and the current spot is \$21.00. On what days will the investor receive a margin call and why? (Assume no deposits or withdrawals.)

Type: Calculation

Level: Medium

LO: 11.2

Suggested answer:

Maintenance margin = 50% of 10,000 = \$5,000 = MM

Day	Spot	Profit	Margin Balance
0	21.00	-	\$10,000 > MM
1	20.50	$(21 - 20.5) \times 10000 = 5000$	$10000 + 5000 = \$15,000 > MM$
2	20.75	$(20.5 - 20.75) \times 10000 = -2500$	$15000 - 2500 = \$12,500 > MM$
3	21.00	$(20.75 - 21) \times 10000 = -2500$	$12500 - 2500 = \$10,000 > MM$
4	20.75	$(21 - 20.75) \times 10000 = 2500$	$10000 + 2500 = \$12,500 > MM$
5	20.00	$(20.75 - 20) \times 10000 = 7500$	$12500 + 7500 = \$20,000 > MM$

The investor will not receive a margin call because the margin balance never drops below the maintenance margin.

44. Explain how derivatives led to the worst recession in the post second world war era.

Type: Concept Difficulty: Medium LO: 11.5

Suggested answer:

The excessive use of derivatives caused one of the worst financial crises in the world. Many financial firms were investing in CDS; these instruments represent swaps on the creditworthiness of funds that backed them up. The increase in interest rates increased the percentage of defaults leading to an important decrease in the funds backed up by the CDS. This resulted in an understanding that greater supervision from the regulatory services is needed.

45. What are the differences between forwards and futures contracts?

Type: Concept Difficulty: Medium Section: Appendix 11A

Suggested answer:

Characteristic	Forwards	Futures
Contracts	Customized	Standardized
Trading	Dealer or OTC markets	Exchanges
Default (credit) risk	Important	Unimportant – Guaranteed by clearinghouse
Initial Deposit	Not required	Initial and maintenance margin required
Settlement	On maturity date	Mark to market daily

46. Assume company L wants to pay a floating rate and company N wants to pay a fixed rate. Company L is quoted 11% fixed rate financing or a floating rate of LIBOR + 0.3%. In contrast, company N is quoted a fixed rate financing at 14% and a floating rate financing at LIBOR + 0.75%. Please calculate the net savings (%) to both parties if a swap is entered into between L and N if N pays L 12.0% and L pays N LIBOR

Type: Calculation Difficulty: Difficult LO: 11.3

Suggested answer:

	L	N
Quotes (%)		
Floating	LIBOR + 0.3%	LIBOR + 0.75%
Fixed	11%	14%
Initial		
Floating		-(LIBOR + 0.75)
Fixed	-11	
Swap	N pays L fixed	L pays N floating
	+12	- 12
	-LIBOR	+ LIBOR
NET	- (LIBOR – 1)	- 12.75
Savings	(LIBOR + 0.3%) - (LIBOR – 1)	14% - 12.75%

	1.3%	1.25%

Net Savings = (Floating or Fixed) + Initial (Floating or Fixed) + Swap

Net Savings L = Floating + Initial Fixed + Swap

47. Company JH enters a swap to pay a fixed rate of 12% and the counterparty MI will pay a floating rate of LIBOR + 0.2%. What are the net payments (in %) from JH's point of view given that LIBOR for the next five periods equals: 8.0, 9.0, 11.0, 12.0, 12.3

Type: Calculation

Difficulty: Easy

LO: 11.3

Suggested answer:

Period	LIBOR	Floating %	Fixed %	Net Payment%
1	8.0	8.2	-12	-3.8
2	9.0	9.2	-12	-2.8
3	11.0	11.2	-12	-0.8
4	12.0	12.2	-12	0.2
5	12.3	12.5	-12	0.5

Payments are negative.

Floating = LIBOR + 0.2

48. Ronald's company enters a 3 year, \$10,000 plain vanilla interest rate swap and agrees to pay LIBOR and receive a fixed rate of 5%. Payments are to be exchanged every six months.

Determine the semi annual payments that Ronald must receive assuming LIBOR has the following values for each six-month period beginning now: 5%, 5.5%, 6%, 4.75%, 4.25%, 4%.

Type: Calculation

Difficulty: Medium

LO: 11.3

Suggested answer:

After	Payment
6 months	$10,000 (0.05 - 0.05) \times \frac{1}{2} = \$0$
12 months	$10,000 (0.05 - 0.055) \times \frac{1}{2} = -\$25$ (Ronald Pays)
18 months	$10,000 (0.05 - 0.06) \times \frac{1}{2} = -\$50$ (Ronald Pays)
24 months	$10,000 (0.05 - 0.0475) \times \frac{1}{2} = \$12.50$
30 months	$10,000 (0.05 - 0.0425) \times \frac{1}{2} = \$37.50$
36 months	$10,000 (0.05 - 0.04) \times \frac{1}{2} = \$50$

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Chapter 12: Options

Multiple Choice Questions

Section 12.1 Call Options

1. A call option is:

- A. the right to buy an underlying asset at a fixed price for a specified time.
- B. the right to sell an underlying asset at a fixed price for a specified time.
- C. a price established today for future delivery.
- D. a standardized exchange traded contract in which the seller agrees to deliver a commodity to the buyer at some point in the future.

Answer: A Type: Definition Difficulty: Easy LO: 12.1

2. An option can be:

- I. in the money
 - II. out of the money
 - III. deep
 - IV. shallow
- A. I, II, III, IV
 - B. I, II, III only
 - C. I, II only
 - D. I only

Answer: B Type: Definition Difficulty: Easy LO: 12.1

3. Use the following statements to answer the following question:

- I. A call option provides insurance against the decrease of the stock price below the strike price.
 - II. The buyer of a call option pays a premium regardless of the underlying asset price.
- A. I and II are correct
 - B. I is correct and II is incorrect
 - C. I is incorrect and II is correct
 - D. I and II are incorrect

Answer: A Type: Definition Difficulty: Medium LO: 12.1

4. The strike price of an option is:

- A. the value of the underlying asset at expiration.
- B. the price of the option.
- C. the proceeds generated if today was the expiration day.
- D. the price at which an investor can buy or sell the underlying asset.

Answer: D Type: Definition Difficulty: Easy LO: 12.1

5. What is a short position?

- A. position taken by the person who sells an option.
- B. position taken by the person who buys an option.
- C. buy a call and buy a put.
- D. sell a call and buy a put.

Answer: A Type: Definition Difficulty: Medium LO: 12.1

6. Jay writes a call option with a strike price of \$50.00. What will be Jay's payoff in dollars if the underlying asset price at expiration is \$55.00?

- A. 5
- B. -5
- C. 0
- D. 105

Answer: B Type: Calculation Difficulty: Easy LO: 12.1

How each option was determined:

- A. 5 $S_T - X = 55 - 50 = 5$ (long position in a call option)
- B. -5 $X - S_T = - (S_T - X) = - (55 - 50) = - 5$ (short or write a call option)
- C. 0 payoff of a put ($X - S_T, 0$)
- D. 105 $55 + 50 = 105$

7. The time value on call option A is \$5.00 and the option premium is \$8.00. What is the intrinsic value of call option A?

- A. 40
- B. 13
- C. -3
- D. 3

Answer: D Type: Calculation Difficulty: Easy LO: 12.1

How each option was determined:

- A. 40 $IV = \text{premium} * TV$
- B. 13 $IV = \text{premium} + TV$
- C. -3 $IV = TV - \text{premium}$
- D. 3 $IV = \text{premium} - TV$

8. If an investor is trying to cancel her short position in a call option, she should:

- A. Buy the underlying asset.
- B. Sell the underlying asset.
- C. Buy the call option.
- D. Sell the call option.

Answer: C Type: Concept Difficulty: Medium LO: 12.1

9. The difference between the intrinsic value of an option and its actual value is:

- A. the payoff
- B. the premium
- C. the time value
- D. the underlying asset cost

Answer: C Type: Concept Difficulty: Medium LO: 12.1

10. Label the diagram below:

- 4
- 3

- 2
- 5
- 1

Time Value

Underlying asset price

Strike price

Intrinsic value of a call

Payoff/profit/option value

A. 1, 2, 3, 4, 5 respectively

B. 5, 3, 2, 4, 1 respectively

C. 4, 1, 2, 5, 3 respectively

D. 5, 1, 2, 4, 3 respectively

Answer: B Type: Definition Difficulty: Medium LO: 12.1

Section 12.2 Put Options

11. The floor price is another term used to refer to the:

A. intrinsic value

B. exercise price

C. price of the underlying asset

D. option premium

Answer: A Type: Definition Difficulty: Medium LO: 12.2

12. A put option with strike price \$60.00 is selling for \$6.00. Calculate the floor price, time value and option premium of this put option assuming the price of the underlying asset is \$50.00.

A. 10, -4, 14

B. 10, -4, 6

C. -10, -4, 6

D. 0, 6, 6

Answer: B Type: Calculation Difficulty: Medium LO: 12.2

How each option was determined:

A. $IV = \max(X - S_T, 0) = 60 - 50 = 10$; $TV = \text{premium} - IV = 6 - 10 = -4$; option premium = $10 + 4 = 14$

B. $IV = \max(X - S_T, 0) = 60 - 50 = 10$; $TV = \text{premium} - IV = 6 - 10 = -4$; option premium = option price = 6

C. $IV = S_T - X = 50 - 60 = -10$; $TV = \text{premium} - IV = 6 - 10 = -4$; option premium = option price = 6

D. $IV = \max(S_T - X, 0) = \max(50 - 60, 0) = 0$; $TV = \text{premium} - IV = 6 - 0 = 6$; option premium = option price = 6

13. Which of the following is the higher priced call option?

A. higher S_T , higher X , increased volatility

B. higher S_T , higher X , decreased volatility

C. higher S_T , lower X , increased volatility

D. lower S_T , higher X , decreased volatility

Answer: C Type: Definition Difficulty: Medium LO: 12.2

14. Which of the following factors increases the price of a put option?

- A. higher asset price, higher strike price, increased volatility, increased dividends
- B. higher strike price, longer time to expiration, increased volatility, increased dividends
- C. higher strike price, longer time to expiration, increased volatility, increased interest rates
- D. longer time to expiration, increased volatility, decreasing interest rates, decreasing dividends

Answer: B Type: Definition Difficulty: Difficult LO: 12.2

15. Holding a put option and a call option on the same underlying asset, striking price and maturity has payoffs equivalent to:

- A. holding a stock today
- B. holding a stock in the future
- C. holding a call option
- D. holding a stock minus a premium

Answer: B Type: Concept Difficulty: Difficult LO: 12.2

16. The intrinsic value of an in the money put option is:

- A. $X - S_T$
- B. $S_T - X$
- C. $X - S_T + P$
- D. 0

Answer: A Type: Definition Difficulty: Medium LO: 12.2

17. An option that can be exercised only at maturity is referred to as a(n):

- A. European option
- B. Call option
- C. Protective put
- D. American option

Answer: A Type: Definition Difficulty: Easy LO: 12.2

18. Which of the following statements is NOT true?

- A. An increase in interest rates decreases the value of a call option.
- B. An increase in volatility increases the value of a call option.
- C. A decrease in volatility decreases the value of a put option.
- D. An increase in the underlying asset's price decreases the value of a put.

Answer: A Type: Concept Difficulty: Medium LO: 12.2

Section 12.3 Put-Call Parity

19. Put - call parity is based on which one of the following principles?

- A. Binomial tree
- B. Time value of money
- C. No arbitrage
- D. Normality of returns

Answer: C Type: Concept Difficulty: Medium LO: 12.3

20. When can the put-call parity be applied?

- I. call and put have the same strike price
- II. call and put have the same time to expiration and are held until expiration

III. call and put are created using the same underlying asset

IV. call and put have the same premium

A. Only I is required

B. Only I and II are required

C. Only I, II and III are required

D. I, II, III and IV are required

Answer: C Type: Definition Difficulty: Easy LO: 12.3

21. Using the following information, find the price of the call option:

Stock price $S_t = \$55$, interest rate $I = 5\%$,

Strike price $X = \$52$, Put premium $= \$1$, Maturity: $T = 3$ months

A. \$ 6.47

B. \$ 0.62

C. \$ 8.47

D. \$ 4.64

Answer: D Type: Calculation Difficulty: Medium LO: 12.3

How options are determined:

A. $C = 1 + 55 - 52 + 5\% = 6.47$

B. $C = 1 + 52 - 55 + 5\% = 0.62$

$$C = 1 + 55 - \left[\frac{52}{\left(1 + \frac{5\%}{4}\right)} \right] = 4.64$$

D.

22. Consider the following information about a one-year option on stock XYZ:

Stock Price	Interest rate	Call Price	Put Price	Strike Price
25	5%	6.00	1.5	20

Using the information above, calculate the arbitrage profit:

A. \$ 0

B. \$ 0.75

C. \$ 1.45

D. \$ 4.19

Answer: B Type: Calculation Difficulty: Difficult LO: 12.3

A. No arbitrage

$$B. C-P-S-PVX=6-1.5-(25-20(1+5\%/4))=0.75$$

$$C. C-P-S-PVX=6-1.5-(25-20(1+5\%))=1.45$$

$$D. C-P-S+PVX=6-1.5-(25+25(1+5\%))=4.19$$

23. Consider the following information about a one-year option on stock XYZ:

Stock Price	Interest rate	Call Price	Put Price	Strike Price
25	5%	6.00	0.75	20

Using the information above, calculate the arbitrage profit:

A. \$ 0

B. \$ 0.70

C. \$ 5.56

D. \$ 6.44

Answer: B Type: Calculation Difficulty: Difficult LO: 12.3

$$|C - P - (S - PV(X))| = \left| 6 - 0.75 - \left[25 - \frac{20}{(1+5\%)} \right] \right| = 0.70$$

$$|C + P - (S - PV(S))| = \left| 6 + 0.75 - \left[25 - \frac{25}{(1+5\%)} \right] \right| = 5.56$$

C.

$$D. C+P-S-PVS=6+0.75-(25-25(1+5\%/4))=6.44$$

24. The _____ is the relationship between the price of a call option and a put option.

- A. binomial option pricing model
- B. Black-Scholes option pricing model
- C. put-call parity
- D. swap

Answer: C Type: Definition Difficulty: Easy LO: 12.3

25. The put-call parity has the following conditions:

- I. both the call and the put have the same X
 - II. both the call and the put are purchased at the same time
 - III. both the call and the put have the same expiration dates
 - IV. assumed to be European
- A. I, II, III only
 - B. I, III, IV only
 - C. I, II, IV only
 - D. II, III, IV only

Answer: B Type: Definition Difficulty: Medium LO: 12.3

26. Which of the following strategies DOES NOT require the investor to long a put?

- A. collar
- B. covered call
- C. synthetic call and synthetic put
- D. protective put

Answer: B Type: Definition Difficulty: Medium LO: 12.3

27. Montreal Smoked Meat shares are selling for \$55.00. The 2 year put option on XYZ shares has the following characteristics: strike = 50, price = \$0.25

Given that the risk free rate is 2%, what is the price of a 2 year call option on XYZ shares with an exercise price of 50?

- A. 5.25
- B. 7.19
- C. -4.75
- D. 0

Answer: B Type: Calculation Difficulty: Difficult LO: 12.3

How each option was determined:

- A. 5.25 $C = P + S - X = 0.25 + 55 - 50 = 5.25$
- B. 7.19 $C = P + S - PV(X) = 0.25 + 55 - [50 / (1.02)^2]$
- C. -4.75 $C = P + X - S = 0.25 + 50 - 55 = -4.75$
- D. 0 $C = P + X - PV(S) = 0.25 + 50 - [55 / (1.02)^2] = -2.61$ value can't be neg.

28. The basic put-call parity can be rearranged as equal to:

- A. $P - S = C + PV(X)$
- B. $C - P = S - PV(X)$
- C. $C = P - S + PV(X)$
- D. $P = C + S + PV(X)$

Answer: B Type: Definition Difficulty: Easy LO: 12.3

29. Given:

asset price today \$50.00

asset price at expiration \$60.00

put strike price \$50.00

call strike price \$50.00

What is the payoff of a protective put and a covered call?

A. 10, 0

B. 0, 10

C. 10, 20

D. 20, 10

Answer: A Type: Calculation Difficulty: Difficult LO: 12.3

How each option was determined:

A. $[(S_T - S_0) + \text{Max}(X - S_T, 0)] = [(60 - 50) + \text{Max}(50 - 60, 0)] = 10$; $(S_T - S_0) - (S_T - X) = [(60 - 50) - (60 - 50)] = 0$

B. $[(S_T - S_0) - (S_T - X)] = [(60 - 50) - (60 - 50)] = 0$ mix up two strategies; $[(S_T - S_0) + \text{Max}(X - S_T, 0)] = [(60 - 50) + \text{Max}(50 - 60, 0)] = 10$

C. $[(S_T - S_0) + \text{Max}(X - S_T, 0)] = [(60 - 50) + \text{Max}(50 - 60, 0)] = 10$; $[(S_T - S_0) + (S_T - X)] = [(60 - 50) + (60 - 50)] = 20$ wrong sign

D. $[(S_T - S_0) + (S_T - X)] = [(60 - 50) + (60 - 50)] = 20$ wrong sign; $[(S_T - S_0) - (S_0 - X)] = [(60 - 50) - (50 - 50)] = 10$ used S_0 instead of S_T

30. Which of the following best defines a covered call?

A. Purchase a put option to protect a long position in an underlying asset.

B. Position between the floor and ceiling price.

C. The right, but not an obligation, to sell an underlying asset at a fixed price for a specified time.

D. Selling call options while owning the underlying asset

Answer: D Type: Definition Difficulty: Medium LO: 12.3

31. Min has created the following portfolio:

bought a share for \$20.00

bought 3 puts, strike price \$18.00

maturity 1yr

Suppose at expiration S_T is \$17.00. What is the payoff of her strategy?

A. 0

B. 3

C. -2

D. -3

Answer: A Type: Calculation Difficulty: Easy LO: 12.3

How each option was determined:

A. 0 Share $(S_T - S_0) = 17 - 20 = -3$
3 puts $3 \text{Max}(X - S_T, 0) = 3(18 - 17) = 3$

Net payoff = 0

B. 3 Share $\text{Max}(S_T - S_0, 0) = 17 - 20 = 0$
3 puts $3 \text{Max}(X - S_T, 0) = 3(18 - 17) = 3$

Net payoff = 3

$$\begin{aligned} \text{C. -2 Share } (S_T - S_0) &= 17 - 20 = -3 \\ \text{puts } \text{Max}(X - S_T, 0) &= (18 - 17) = 1 \end{aligned}$$

Net payoff = -2

$$\begin{aligned} \text{D. -3 Share } (S_T - S_0) &= 17 - 20 = -3 \\ 3 \text{ puts } 3\text{Max}(S_T - X, 0) &= 3(0) = 0 \end{aligned}$$

Net payoff = -3

32.

30

60

In the above collar position, what is the payoff if the underlying asset today is \$40.00 and at expiration is \$50.00.

A. -10

B. 10

C. 20

D. -30

Answer: B Type: Calculation Difficulty: Medium LO: 12.3

How each option was determined:

$$\begin{aligned} \text{A. -10 long put} &= \text{Max}(X_1 - S_T, 0) = \text{Max}(30 - 50, 0) = 0 \\ \text{short call} &= -\text{Max}(S_T - X_2, 0) = -\text{Max}(50 - 60, 0) = -10 \end{aligned}$$

Net payoff = -10

$$\text{B. 10 long asset} = 50 - 40 = 10$$

Net payoff = 10

$$\begin{aligned} \text{C. 20 long put} &= -\text{Max}(X_2 - S_T, 0) = -\text{Max}(60 - 50, 0) = -10 \text{ so } 0 \\ \text{short call} &= \text{Max}(S_T - X_1, 0) = \text{Max}(50 - 30, 0) = 20 \end{aligned}$$

Net payoff = 20

$$\begin{aligned} \text{D. -30 long put} &= (X_1 - S_0, 0) = (30 - 40) = -10 \\ \text{short call} &= -\text{Max}(S_0 - X_2, 0) = -\text{Max}(40 - 60, 0) = -20 \end{aligned}$$

Net payoff = -30

Section 12.4 Option Pricing

33. Given current asset price = 50

strike price = 50

risk-free rate = 1%

time to expiration of the option = 2 years

$$N(d_1) = 0.5793$$

$$N(d_2) = 0.4602$$

Based on the Black-Scholes option pricing model, calculate the price of the corresponding call option. (round to 2 decimal places).

A. 0

B. 5.49

C. 5.96

D. 6.41

Answer: D Type: Calculation Difficulty: Medium LO: 12.4

How each option was determined:

- A. $S N(d_2) - Xe^{-rt} N(d_1) = 50(0.4602) - 50e^{-0.01(2)}(0.5793) = -5.38$ formula error
- B. $S N(d_1) - Xe^{-rt} N(d_2) = 50(0.5793) - 50e^{-0.01(2)}(0.4602) = 5.49$ discounting error
- C. $S N(d_1) - X N(d_2) = 50(0.5793) - 50(0.4602) = 5.96$ discounting error
- D. $S N(d_1) - Xe^{-rt} N(d_2) = 50(0.5793) - 50e^{-0.01(2)}(0.4602) = 6.41$

34. The standard Black-Scholes Option Pricing model applies to:

- A. European call options on non-dividend paying stocks
- B. American call options on non-dividend paying stocks
- C. European call options on all stocks
- D. American call options on all stocks

Answer: A Type: Definition Difficulty: Easy LO: 12.4

35. The Black-Scholes model includes the following components:

- I. the standard deviation of the underlying asset
- II. present value of the strike price
- III. current value of the underlying asset
- IV. cumulative standard normal density functions

- A. I only
- B. I, II only
- C. I, II, III only
- D. I, II, III, IV

Answer: D Type: Definition Difficulty: Medium LO: 12.4

36. Given: $S = 55$, $X = 50$, $r = 5\%$, $t = 4$ months and $\sigma = 20\%$ calculate d_1 and d_2 .

- A. -0.62334, -0.73881 respectively
- B. 1.0275, -0.4501 respectively
- C. -0.62334, -0.82334 respectively
- D. 1.0275, 0.9120 respectively

Answer: D Type: Calculation Difficulty: Difficult LO: 12.4

How each option was determined:

- A. -0.62334, $d_1 = [\ln(X/S) + (r + \sigma^2/2)t] / \sigma \sqrt{t}$; -0.73881, $d_2 = d_1 - \sigma \sqrt{t}$
- B. 1.0275, $d_1 = [\ln(S/X) + (r + \sigma^2/2)t] / \sigma \sqrt{t}$; -0.4501, $d_2 = d_1 - \sqrt{t}$
- C. -0.62334, $d_1 = [\ln(X/S) + (r + \sigma^2/2)t] / \sigma \sqrt{t}$; -0.82334, $d_2 = d_1 - \sigma$
- D. 1.0275, $d_1 = [\ln(S/X) + (r + \sigma^2/2)t] / \sigma \sqrt{t}$; 0.9120, $d_2 = d_1 - \sigma \sqrt{t}$

37. Which of the “Greeks” measure the change in option value with a change in volatility of the underlying asset?

- A. delta
- B. theta
- C. gamma
- D. vega

Answer: D Type: Definition Difficulty: Medium LO: 12.4

38. Use the following statements to answer this question:

- I. The “Greeks” are important when constructing portfolios of options to hedge against changes in market conditions.
 II. A portfolio of options that provides a hedge against changes in the underlying asset is called a gamma hedged portfolio.
- A. I and II are correct
 B. I and II are incorrect
 C. I is correct and II is incorrect
 D. I is incorrect and II is correct

Answer: A Type: Concept Difficulty: Difficult LO: 12.4

Section 12.5 Option Markets

39. Which of the following best defines implied volatility?
- A. An estimate of the price volatility of an option.
 B. The observed relationship of past and present option prices.
 C. An estimate of the price volatility of the underlying asset based on observed option prices.
 D. The observed relationship of past and present price volatility of the underlying asset.

Answer: C Type: Definition Difficulty: Difficult LO: 12.5

40. Use the following statements to answer the question:
- I. VIX is a measure of volatility in the financial markets
 II. VIX is calculated as the aggregate volatility of option prices.

- A. I and II are correct
 B. I and II are incorrect
 C. I is correct and II is incorrect
 D. I is incorrect and II is correct

Answer: C Type: Concept Difficulty: Medium LO: 12.5

41. _____ is an estimate of the _____ of the underlying asset based on observed option prices.

- A. price volatility; estimated volatility
 B. implied volatility; price volatility
 C. price volatility; implied volatility
 D. estimated volatility; price volatility

Answer: B Type: Definition Difficulty: Medium LO: 12.5

Section Appendix 12A Binomial Option Pricing and Risk-Neutral Probabilities

42.

$$p_u = 0.6$$

$$p_d = 0.4$$

$$S_o = 20$$

$$S_u = 25$$

$$S_d = 10$$

What is the expected value of this asset?

- A. \$ 19.00
 B. \$ 3.00

C. \$16.00

D. \$23.00

Answer: A Type: Calculation Difficulty: Easy LO: 12.4

How each option was determined:

A. $S_u(\text{pu}) + S_d(\text{pd}) = 25(0.6) + 10(0.4) = 19$

B. $(S_u - S_o)(\text{pu}) + \text{Max}(S_d - S_o, 0)(\text{pd}) = 3$

C. $S_u(\text{pd}) + S_d(\text{pu}) = 25(0.4) + 10(0.6) = 16$

D. $S_u(\text{pu}) + S_o(\text{pd}) = 25(0.6) + 20(0.4) = 23$

43.

$$p_u = 0.5$$

$$p_d = 0.5$$

$$S_o = 30$$

$$S_1 = 35$$

$$S_1 = 25$$

What is the value of a call option with a strike price of \$30.00 in scenario:

a. $S_1 = 35$

b. $S_1 = 25$

A. 5, -5

B. 5, 0

C. 0, 0

D. 0, 5

Answer: B Type: Calculation Difficulty: Medium LO: 12.4

How each option was determined:

A. $(S_1 - S_o) = 35 - 30 = 5; 25 - 30 = -5$

B. $\text{Max}(S_1 - X, 0) = 35 - 30 = 5; 25 - 30 = 0$

C. $\text{Max}(X - S_o, 0) = 30 - 30 = 0; 25 - 30 = 0$

D. $\text{Max}(X - S_T, 0) = 30 - 35 = 0; 30 - 25 = 5$

44.

$$0.8$$

$$0.2$$

$$S_o = 60$$

$$S_1 = 80$$

$$S_1 = 55$$

What is the hedge ratio given the strike price is 60?

A. 1.25

B. -1

C. -4

D. 0.25

Answer: A Type: Calculation Difficulty: Medium LO: 12.4

How each option was determined:

A. $h = (S_u - S_d) / (S_u - X) = (80 - 55) / (80 - 60) = 25/20 = 1.25$

$$B. h = (X - S_u) / (S_u - X) = (60 - 80) / (80 - 60) = -20 / 20 = -1$$

$$C. h = (S_u - S_o) / (S_d - S_o) = (80 - 60) / (55 - 60) = 2 / -5 = -4$$

$$D. h = (X - S_d) / (S_u - X) = (60 - 55) / (80 - 60) = 5 / 20 = 0.25$$

45. Francis is long the underlying and has sold h number of call options with the following binomial tree:

$$\begin{array}{c} 0.6 \\ 0.4 \\ S_o = 20 \\ S_1 = 25 \\ S_1 = 15 \\ X = 20 \end{array}$$

Given the current asset price is \$25 and r is 5%, what is the price of one of the above call options?

- A. \$ 5.36
- B. \$ 0.60
- C. \$ 21.43
- D. -\$21.43

Answer: A Type: Calculation Difficulty: Difficult LO: 12.4

How each option was determined:

$$A. h = (25 - 15) / (25 - 20) = 2; C = 1/h [S - (S_d/(1+r))] = 5.357$$

$$B. h = (25 - 15) / (25 - 20) = 2; C = 1/h [S - (S_u/(1+r))] = 0.60$$

$$C. h = (25 - 20) / (25 - 15) = 0.5; C = 1/h [S - (S_d/(1+r))] = 21.43$$

$$D. h = (15 - 20) / (25 - 15) = -0.5; C = 1/h [S - (S_d/(1+r))] = -21.43$$

46. Toronto Skaters stock is now worth \$100.00. In one month it can either be \$80.00 or \$120.00. Given that the monthly risk free rate is 2%, how many calls does the investor need to sell to hedge a long position in ABC stock? What is the corresponding value of the call? (assume strike price = \$100.00)

- A. 0.5; \$ 43.14
- B. 1; \$ 21.57
- C. 2; \$10.78
- D. 2; \$43.14

Answer: C Type: Calculation Difficulty: Difficult LO: 12.4

How each option was determined:

$$A. 0.5; \$ 43.14 \quad h = (P_u - X)/(P_u - P_d) = 0.5; C = 1/h [S - (P_d/(1+r))]$$

$$B. 1; \$ 21.57 \quad h = (X - P_d)/(P_u - X) = 1; C = 1/h [S - (P_d/(1+r))]$$

$$C. 2; \$10.78 \quad h = (P_u - P_d)/(P_u - X) = 2; C = 1/h [S - (P_d/(1+r))]$$

$$D. 2; \$43.14 \quad h = (P_u - P_d)/(P_u - X) = 2; C = h [S - (P_d/(1+r))]$$

47. Assume the current value of the underlying asset is \$20.00 and the value of the underlying asset tomorrow can either be \$15.00 or \$25.00. What is the risk neutral probability of generating a 2% return on the asset?

- A. 0.54

- B. -1.46
C. 0.135
D. 0.9

Answer: A Type: Calculation Difficulty: Easy LO: 12.4

How each option was determined:

- A. 0.54 $20(1.02) = 25 (P) + 15 (1-P)$
B. -1.46 $20(0.02) = 25 (P) + 15 (1-P)$
C. 0.135 $20(1.02) = 25 (P) + 15 (1+P)$
D. 0.9 $20(1.2) = 25 (P) + 15 (1-P)$

Practice Problems

48. (Assume: continuous compounding and value of the underlying asset is \$22)

Marie wants to determine the fair value of a put option with strike price \$20 due to expire in 2 years. A call with the same strike price and expiration is worth \$5. The risk free rate is 4%. What would you tell Marie is the fair value of the put option?

Type: Calculation Difficulty: Medium LO: 12.3

Suggested answer:

Using the put-call parity

$P + S = C + PV(X)$ make P the subject of the equation

$$\begin{aligned} P &= C - S + PV(X) \\ &= 5 - 22 + 20e^{-(0.04)(2)} \\ &= 1.4623 \\ &= \$1.46 \end{aligned}$$

49. Assume the following:

$$S = 25$$

Exercise price = 20

Risk free rate = 1%

Volatility is 20%

The option expires in one year

What is the value of the corresponding call option? (NOTE: if using the appendix A-1 to solve for the $N(d_1)$ and $N(d_2)$ values you should truncate d_1 and d_2 to two decimal places and round DOWN.

Type: Calculation Difficulty: Medium LO: 12.4

Suggested answer:

Applying the Black-Scholes Model

$$d_1 = \frac{\ln(25/20) + (0.01 + (0.2^2)/2)1}{0.2 \sqrt{1}} = 1.2657$$

$$= 1.26$$

$$\begin{aligned} d_2 &= d_1 - 0.2 \sqrt{1} = 1.2657 - 0.2 \sqrt{1} = 1.0657 \\ &= 1.06 \end{aligned}$$

From Appendix A-1

$$N(d_1) = 0.8962$$

$$N(d_2) = 0.8554$$

$$\begin{aligned} C &= S N(d_1) - X e^{-rt} N(d_2) \\ &= 25 (0.8962) - 20 e^{-0.01(1)} (0.8554) = 5.467 = \$ 5.47 \end{aligned}$$

50. The current value of the underlying asset is \$80.00. The strike price of a call option with one month to expiration is \$85.00. There is a 20% chance that in one month the value of the underlying asset will be \$75.00 and 80% chance that it will be \$90.00.

a) What is the expected value of the underlying asset and the corresponding rate of return?

b) What is the hedge ratio and the corresponding value of the call given $r = 0.02\%$?

Type: Calculation Difficulty: Difficult Section: Appendix 12A

Suggested answer:

$$\begin{aligned} \text{a) Expected value} &= S_d (1-P) + S_u (P) \\ &= 75 (0.2) + 90 (0.8) \\ &= \$87.00 \end{aligned}$$

$$\begin{aligned} \text{Respective expected rate of return} &= (\text{expected value} - \text{current value}) / \text{current value} \\ &= (87 - 80) / 80 = 0.0875 \text{ or } 8.75\% \end{aligned}$$

$$\text{b) } h = \frac{P_u - P_d}{P_u - X} = \frac{90 - 75}{90 - 85} = 3$$

$$C = 1/h (S - P_d/(1+r)) = 1/3 (80 - 75/(1.02)) = 2.15686 = \$ 2.16$$

51. Create a table illustrating the range of payoffs of a protective put strategy for the following values of the underlying asset: 60, 70, 80, 90, 100. The strike price of all options in the strategy is \$80.00 and the current value of the underlying asset is \$80.00.

Type: Calculation Difficulty: Medium LO: 12.2

Suggested answer:

S_T	60	70	80	90	100
Long Asset	$60 - 80 = -20$	$70 - 80 = -10$	$80 - 80 = 0$	$90 - 80 = 10$	$100 - 80 = 20$
Long Put	$80 - 60 = 20$	$80 - 70 = 10$	$\text{Max}(X - S_T) = 0$	$\text{Max}(X - S_T) = 0$	$\text{Max}(X - S_T) = 0$
Net Payoff	0	0	0	10	20

Long asset payoff = $S_T - S_0$

Long Put = $\text{Max}(X - S_T)$

52. Create a table depicting the payoffs for a collar given $X_{\text{put}} = 50$, $S = 55$ and $X_{\text{call}} = 60$.

Assume the value of the asset in 2 months will be: 40, 50, 55, 60, 75, 80.

Type: Calculation Difficulty: Difficult LO: 12.1, 12.2

Suggested answer:

S_T	40	50	55	60	75	80
Long Asset	$40 - 55 = -15$	$50 - 55 = -5$	0	5	20	25
Long Put	$50 - 40 = 10$	$50 - 50 = 0$	0	0	0	0
Short call	$-\text{Max}(S_T - X) = 0$	0	0	0	-15	-20
Net Payoff	-5	-5	0	5	5	5

Long asset payoff = $S_T - S_0$

Long Put = $\text{Max} (X - S_T, 0)$

Short Call = $-\text{Max} (S_T - X, 0)$

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Chapter 13: Capital Budgeting, Risk Considerations, and Other Special Issues**Multiple Choice Questions****Section 13.1 Capital Expenditures**

1. Which of the following is a FALSE statement of capital expenditures?

- A. They are a firm's investments in long-lived assets
- B. They may be tangible assets or intangible assets
- C. They determine a company's future direction
- D. They usually involve large amounts of money and the decisions are frequently recoverable.

Answer: D Type: Concept Difficulty: Medium LO: 13.1

2. Which of the following is NOT one of the distinct steps in the capital budgeting?

- A. Identifying investment alternatives
- B. Obtaining the financing to pay for the investment
- C. Implementing the chosen investment decisions
- D. Monitoring and evaluating the implemented decisions

Answer: B Type: Concept Difficulty: Medium LO: 13.1

3. A firm that does not invest effectively will:

- A. find itself at a competitive advantage.
- B. make itself more attractive in the short run.
- C. increase its cost of capital.
- D. increase its market prices of debt and equity securities.

Answer: C Type: Concept Difficulty: Easy LO: 13.1

4. Which of the following is NOT one of Michael Porter's five critical factors that determine the attractiveness of an industry?

- A. Entry barriers.
- B. The threat of substitutes.
- C. The bargaining power of buyers/suppliers.
- D. Coalition among existing competitors.

Answer: D Type: Definition Difficulty: Easy LO: 13.1

5. Which one of the following statements is NOT true?

- A. Capital expenditures in good projects will increase the value of the firm.
- B. A pending drug patent can be used as a collateral.
- C. Capital budgeting is a dynamic process and depends on changing conditions.
- D. A change in interest rates is not important enough to change a decision about a project.

Answer: D Type: Concept Difficulty: Medium LO: 13.1

6. Michael Porter argues that firms can create competitive advantages for themselves by adopting one of the following strategies:

- I. Cost leadership: firms strive to use the latest technology to lower the costs of production.
- II. Differentiation: firms can differentiate their products by providing customers with unique delivery alternatives.

A. I and II are correct.

- B. I and II are incorrect.
- C. I is correct, II is incorrect.
- D. I is incorrect, II is correct.

Answer: A Type: Definition Difficulty: Medium LO: 13.1

7. Use the following two statements to answer this question:

- I. Bottom-up analysis: an investment strategy in which capital expenditure decisions are considered in connection with whether the firm should continue in this business or for general industry and economic trends.
 - II. Top-down analysis: an investment strategy that focuses on strategic decisions, such as which industries or products the firm should be involved in, looking at the overall economic picture.
- A. I and II are correct.
 - B. I and II are incorrect.
 - C. I is correct, II is incorrect.
 - D. I is incorrect, II is correct.

Answer: D Type: Concept Difficulty: Medium LO: 13.1

8. Use the following two statements to answer this question:

- I. DCF methodologies are techniques for making capital expenditure decisions that are consistent with the overriding objective of maximizing shareholder wealth.
 - II. DCF valuation involves estimating future cash flows and comparing their future values with investment outlays required today.
- A. I and II are correct.
 - B. I and II are incorrect.
 - C. I is correct, II is incorrect.
 - D. I is incorrect, II is correct.

Answer: C Type: Concept Difficulty: Easy LO: 13.1

Section 13.2 Evaluating Investment Alternatives

9. Which of the following is **NOT** a true statement of the Net Present Value (NPV) analysis?
- A. The NPV of a project is the sum of the present value of all future after-tax incremental cash flows generated by an initial cash outlay, minus the present value of the investment outlays.
 - B. Projects that have a positive NPV should be accepted, and projects that have a negative NPV should be rejected.
 - C. The NPV is the present value of the expected cash flows net of the costs needed to generate them.
 - D. The firm's after-tax marginal cost of capital is the appropriate discount rate for all projects.

Answer: D Type: Concept Difficulty: Difficult LO: 13.2

10. Which of the following statements is FALSE?

- A. Positive NPVs arise only in situations in which a company has a competitive advantage.
- B. Projects that produce an NPV of zero should be accepted.
- C. The market value of any firm in an efficient market should equal the NPVs of its projects.
- D. Because of the competitive nature of today's business environment, we would not expect to see an abundance of positive NPV opportunities to persist for very long.

Answer: C Type: Concept Difficulty: Difficult LO: 13.2

11. Which of the following statements is TRUE?

- A. Projects with a positive NPV will always be positive regardless of economic conditions.
- B. Projects that produce an NPV of zero should be rejected.
- C. The market value of any firm in an efficient market should equal the sum of all projects costs.
- D. Because of the competitive nature of today's business environment, we would not expect to see an abundance of positive NPV opportunities to persist for very long.

Answer: D Type: Concept Difficulty: Difficult LO: 13.1

12. Suppose a project requires an initial investment of \$10,000 and it will yield \$10,500 one year later. The NPV of the project is:

- A. Equal to \$500.
- B. Less than 0 if the discount rate is less than 5 percent.
- C. Zero if the discount rate is equal to 5 percent.
- D. Positive if the discount rate is greater than 5 percent.

Answer: C Type: Concept Difficulty: Easy LO: 13.2

13. A project that requires a \$ 100,000 investment yields \$50,000 in 6 months and \$50,000 in one year should be rejected for the following reasons:

- I. The cost of time is not incorporated in the calculation
- II. The sum of the cash flows is equivalent to the initial investment

- A. I only
- B. II only
- C. I and II
- D. None of these reasons

Answer: C Type: Concept Difficulty: Medium LO: 13.2

14. The IRR and NPV may yield the same conclusion about a project except:

- A. When interest rates are too high
- B. When the project is short term
- C. When cash flows are irregular
- D. When the management is using debt to finance the project

Answer: C Type: Concept Difficulty: Medium LO: 13.2

15. The acceptance of an investment project implies that:

- I. Its IRR is greater than a certain threshold.
- II. Its NPV is greater than its IRR.
- III. Its NPV is greater than or equal to 0.

- A. I only
- B. II only
- C. I and II only
- D. I and III only

Answer: D Type: Concept Difficulty: Easy LO: 13.2

16. The Risk Adjusted Discount Rate is

- A. The overall company expected return for investors

- B. The debt rate of the company
- C. The cost of financing from the bank
- D. The discount rate that reflects the project's risk

Answer: D Type: Concept Difficulty: Easy LO: 13.2

17. The internal rate of return (IRR) is:

- A. the discount rate that makes the NPV greater than zero for a given set of cash flows.
- B. the discount rate that sets the FV of future CFs equal to the initial cash outlay.
- C. the opportunity cost of the capital invested in the project.
- D. the economic rate of return of a given project.

Answer: D Type: Concept Difficulty: Medium LO: 13.2

18. Use the following two statements to answer this question:

- I. A firm should accept a project whenever $IRR > k$.
- II. When $IRR < k$, the NPV will be positive, and vice versa.

- A. I and II are correct.
- B. I and II are incorrect.
- C. I is correct, II is incorrect.
- D. I is incorrect, II is correct.

Answer: C Type: Concept Difficulty: Medium LO: 13.2

19. Which of the following statements is **FALSE**?

- A. The NPV profile shows the NPV of a project for various IRRs.
- B. Mutually exclusive projects are projects for which the acceptance of one precludes the acceptance of one or more of the alternative projects.
- C. The crossover rate is a special discount rate at which the NPV profiles of two projects cross.
- D. There may be more than one IRR for cash flow streams where the cash flows change signs more than once.

Answer: A Type: Concept Difficulty: Medium LO: 13.2

20. You are the CFO of a major, publicly traded corporation. You must choose between two mutually exclusive projects. You will accept a project based on which of the following?

- A. The greatest increase in shareholder value.
- B. The highest accounting profit.
- C. The greatest tax benefit.
- D. The highest internal rate of return.

Answer: A Type: Concept Difficulty: Easy LO: 13.2

21. Which of the following are **NOT** mutually exclusive projects?

- A. Building a factory in New Brunswick or Nova Scotia.
- B. Building a gas station or a strip mall on a given piece of land.
- C. Selling canoes or paddles.
- D. An electricity utility building a coal-fired power plant or a natural gas-fired plant.

Answer: C Type: Concept Difficulty: Easy LO: 13.2

22. Suppose a company has an investment that requires an after-tax incremental cash outlay of \$12,000 today. It estimates that the expected future after-tax cash flows associated with this investment are \$5,000 in years 1 and 2, and \$8,000 in year 3. Using a 12-percent discount rate, determine the project's NPV.

- A. \$16,071.43
- B. \$ 14,144.50
- C. \$ 4,071.43
- D. \$ 2,144.50

Answer: D Type: Calculation Difficulty: Medium LO: 13.2

How options were determined:

A. $5000(1+12\%)+5000(1+12\%)^1+8000(1+12\%)^1=\$ 16,071.43$

B. $5000(1+12\%)+5000(1+12\%)^2+8000(1+12\%)^3=\$ 14,144.50$

C. $5000(1+12\%)+5000(1+12\%)^1+8000(1+12\%)^1-12,000=\$4,071.43$

D. $5000(1+12\%)+5000(1+12\%)^2+8000(1+12\%)^3-12,000=\$2,144.50$

23. Suppose a company has an investment that requires an after-tax incremental cash outlay of \$12,000 today. It estimates that the expected future after-tax cash flows associated with this investment are \$5,000 in years 1 and 2, and \$8,000 in year 3. What is the IRR?

- A. 50%
- B. 49.26%
- C. 21.32%
- D. Cannot be determined

Answer: C Type: Calculation Difficulty: Medium LO: 13.2

A. $5000(1+IRR\%)+5000(1+IRR)^1+8000(1+IRR)^1-12000=0$ solve for IRR

B. $5000(1+IRR\%)+5000(1+IRR)^2+8000(1+IRR)^3-8000=0$ solve for IRR

C. $5000(1+IRR\%)+5000(1+IRR)^2+8000(1+IRR)^3-12000=0$ solve for IRR

24. What is the major assumption in the calculation of IRR?

- A. IRR is more intuitive than NPV
- B. Every dollar of cash flows is reinvested at the discount rate
- C. Every dollar of cash flows is reinvested at the IRR
- D. Every dollar of cash flows is measured in real dollars

Answer: C Type: Concept Difficulty: Medium LO: 13.2

25. Consider the following graph:

Which capital budget criterion would yield contradictory conclusions about this project?

- A. Net present value
- B. Payback period
- C. Discounted payback period
- D. Internal rate of return

Answer: D Type: Concept Difficulty: Difficult LO: 13.2

26. Which one of the following is an example of mutual exclusive projects?

I. A piece of land may be either used for the extension of the existing plant or the building of a more efficient headquarters for the company.

II. Extending the plant or relocating the company's headquarters to a new location

- A. I only
- B. II only
- C. Both I and II
- D. Neither I nor II

Answer: A Type: Concept Difficulty: Difficult LO: 13.2

27. If projects Mars and Venus are mutually exclusive, the acceptance of project Mars means:

- A. project Venus is rejected.
- B. project Venus is accepted.
- C. project Mars has a higher IRR
- D. project Venus has a shorter payback period.

Answer: A Type: Concept Difficulty: Easy LO: 13.2

28. Suppose the projects Mars and Venus are mutually exclusive. Project Mars has an IRR of 10 percent and project Venus has an IRR of 20 percent. One can then conclude that:

- A. project Venus must always be preferred to Mars.
- B. project Mars must always be preferred to Venus.
- C. project Mars has a negative NPV while project Venus has a positive NPV
- D. it is impossible to rank the two projects without further information about the timing of the cash flows.

Answer: D Type: Concept Difficulty: Medium LO: 13.2

29. Suppose the Canadian Space Agency has two mutually exclusive projects: landing a woman on Mars and landing a man on Venus. Project Mars has an IRR of 12 percent and project Venus has an IRR of 15 percent. The crossover rate is 9 percent. The project's appropriate discount rate is 18 percent.

- A. Accept project Mars.
- B. Accept project Venus.
- C. Accept both projects.
- D. Accept neither project.

Answer: D Type: Concept Difficulty: Medium LO: 13.2

30. Suppose the Canadian Space Agency has two mutually exclusive projects: landing a woman on Mars and landing a man on Venus. Project Mars has an IRR of 12 percent and project Venus has an IRR of 15 percent. The crossover rate is 9 percent. The project's appropriate discount rate is 8 percent.

- A. Accept project Mars.
- B. Accept project Venus.
- C. Accept both projects.
- D. Accept neither project.

Answer: A Type: Concept Difficulty: Difficult LO: 13.2

Explanation of answer: As the appropriate discount rate is lower than the cross-over rate, the lower IRR project dominates (see graph below)

31. Suppose the Canadian Space Agency has two mutually exclusive projects: landing a woman on Mars and landing a man on Venus. Project Mars has an IRR of 12 percent and project Venus has an IRR of 15 percent. The crossover rate is 9 percent. The project's appropriate discount rate is 10 percent.

- A. Accept project Mars.
- B. Accept project Venus.
- C. Accept both projects.
- D. Accept neither project.

Answer: B Type: Concept Difficulty: Difficult LO: 13.2

Explanation of answer: As the appropriate discount rate is higher than the cross-over rate, the higher IRR project dominates (see graph below)

32. Suppose the Canadian Space Agency has two independent Martian rover projects: Spirit and Endeavour. Project Spirit has an IRR of 13 percent and project Endeavour has an IRR of 15 percent. The crossover rate is 10 percent. The project's appropriate discount rate is 12 percent.

- A. Accept project Spirit.
- B. Accept project Endeavour.
- C. Accept both projects.
- D. Accept neither project.

Answer: C Type: Concept Difficulty: Medium LO: 13.2

33. Suppose the Canadian Space Agency has two independent Martian rover projects: Spirit and Endeavour. Project Spirit has an IRR of 10 percent and project Endeavour has an IRR of 15 percent. The crossover rate is 9 percent. The project's appropriate discount rate is 12 percent.

- A. Accept project Spirit.
- B. Accept project Endeavour.
- C. Accept both projects.
- D. Accept neither project.

Answer: B Type: Concept Difficulty: Medium LO: 13.2

34. Suppose the Canadian Space Agency has two independent Martian rover projects: Spirit and Endeavour. Project Spirit has an IRR of 10 percent and project Endeavour has an IRR of 15 percent. The crossover rate is 9 percent. The project's appropriate discount rate is 18 percent.

- A. Accept project Spirit.
- B. Accept project Endeavour.
- C. Accept both projects.
- D. Accept neither project.

Answer: D Type: Concept Difficulty: Medium LO: 13.2

35. Use the following two statements to answer this question:

- I. The NPV assumes that all cash flows are reinvested at the firm's cost of capital.
- II. The IRR assumes that all cash flows are reinvested at the project's economic rate of return.

- A. I and II are correct.
- B. I and II are incorrect.
- C. I is correct, II is incorrect.
- D. I is incorrect, II is correct.

Answer: A Type: Concept Difficulty: Medium LO: 13.2

36. The net present value method is preferred to the internal rate of return in all of the following situations **EXCEPT**:

- A. mutually exclusive projects
- B. projects of different scales
- C. projects with multiple cash inflows and outflows
- D. the net present value method is preferred in all of the above situations

Answer: D Type: Concept Difficulty: Medium LO: 13.2

37. Which one of the following approaches will always yield the same results as the NPV?

- A. Internal rate of return
- B. Payback period
- C. Profitability index
- D. All of the above

Answer: C Type: Concept Difficulty: Medium LO: 13.2

38. Which of the following is a DCF approach?

- I. Profitability index
 - II. Internal rate of return
 - III. Net present value
 - IV. Payback period
- A. I and III only.
 - B. II and III only.
 - C. I, II, and III only.
 - D. I, III, and IV only.

Answer: C Type: Concept Difficulty: Easy LO: 13.2

39. Which of the following ignores late cash flows?

- I. Profitability index
 - II. Discounted payback period
 - III. Net present value
 - IV. Payback period
- A. I and III only.
 - B. II and IV only.
 - C. I, II, and III only.
 - D. I, III, and IV only.

Answer: B Type: Concept Difficulty: Easy LO: 13.2

40. The NPV rule is preferred to the payback period as a project evaluation criterion because the payback period rule ignores:

- I. the initial cost
 - II. the timing of cash flows prior to the payback period
 - III. any cash flows beyond the payback period
- A. III only
 - B. I and II only
 - C. I and III only
 - D. II and III only

Answer: D Type: Concept Difficulty: Easy LO: 13.2

41. Which of the following is FALSE about the payback period?

- A. It is used as an informal measure of project risk.
- B. It is implemented by choosing an arbitrary cut-off date.
- C. It rejects projects whose payback period is shorter than the cut-off period.
- D. It disregards the time and risk value of money.

Answer: C Type: Concept Difficulty: Easy LO: 13.2

42. Which of the following is **NOT** a disadvantage of the payback period?

- A. It disregards the time and risk value of money.
- B. It provides an intuitive measure of how long it takes to recover an investment.
- C. It does not account for the cash flows received after the cut-off date.
- D. The choice of the cut-off date is somewhat arbitrary.

Answer: B Type: Concept Difficulty: Easy LO: 13.2

43. The NPV rule is preferred to the discounted payback period as a project evaluation criterion because the discounted payback period rule ignores:

- I. The initial cost
- II. The timing of cash flows prior to the discounted payback period
- III. Any cash flows beyond the discounted payback period

- A. III only
- B. I and II only
- C. I and III only
- D. II and III only

Answer: A Type: Concept Difficulty: Easy LO: 13.2

44. Which of the following is **NOT** true about the discounted payback period?

- A. It accounts for the time value of money.
- B. It ignores cash flows beyond the cut-off date.
- C. The choice of the cut-off date is somewhat arbitrary.
- D. Projects with discounted payback periods beyond the cut-off date will be accepted.

Answer: D Type: Concept Difficulty: Easy LO: 13.2

45. The discounted payback period is longer than the simple payback period because:

- A. the future cash flows are worth less.
- B. the cut-off dates are different.
- C. the cash outflows are worth more.
- D. the PV of cash inflows are worth more.

Answer: A Type: Concept Difficulty: Medium LO: 13.2

46. Use the following statements to answer the question:

- I. The payback period does not take into consideration time value of money
- II. In capital budgeting, the most important factor is to recoup the initial investment.

- A. I and II are correct
- B. I and II are incorrect
- C. I is correct and II is incorrect
- D. I is incorrect and II is correct

Answer: C Type: Concept Difficulty: Medium LO: 13.2

47. If the NPV of a project is greater than zero, then its profitability index is

- A. less than 1.
- B. less than 0.

- C. greater than 1.
D. greater than 0.

Answer: C Type: Concept Difficulty: Medium LO: 13.2

48. Which of the following is FALSE about the profitability index?

- A. It is an absolute measure of wealth.
B. It is often used when firms are capital constrained.
C. It produces the same accept/reject decisions as does the NPV.
D. It works even when future cash flows change signs.

Answer: A Type: Concept Difficulty: Medium LO: 13.2

49. If the NPV of a project is less than zero, then its profitability index is:

- A. less than 1.
B. less than 0.
C. greater than 1.
D. greater than 0.

Answer: A Type: Concept Difficulty: Medium LO: 13.2

50. Suppose your friend Sarah came to see you with an opportunity to invest in a project that generates \$5,000 in the first and the third year, and where the revenue in the second year is \$3,000. The initial investment required for the project is \$10,000. If the risk adjusted rate is 15%, she insists that the project is worth the investment. Which method is Sarah using?

- A. Internal Rate of Return
B. Payback period
C. Net present value
D. Profitability index

Answer: B Type: Calculation Difficulty: Medium LO: 13.2

51. Suppose you have an opportunity to invest in a project, which requires a cash outlay of \$15,000 today. The project is expected to generate \$6,000 in year 1, \$6,500 in year 2, and \$7,000 in year 3. The appropriate risk-adjusted discount rate for the project is 12 percent. What is project's NPV? Assume the tax rate is zero.

- A. -\$1,120.29
B. \$521.36
C. \$732.48
D. \$2,410.71

Answer: B Type: Calculation Difficulty: Easy LO: 13.2

$$= -15,000 + \frac{6,000 + 6,500 + 7,000}{1.12^3} = -\$1,120.29$$

$$NPV = -\$15,000 + \frac{\$6,000}{1.12} + \frac{\$6,500}{1.12^2} + \frac{\$7,000}{1.12^3} = \$521.36$$

$$\left(-15,000 + \frac{6,000}{1.12} + \frac{6,500}{1.12^2} + \frac{7,000}{1.12^3} \right) * (1.12)^3 = \$732.48$$

C.

$$D. NPV = -15,000 + 19,500/(1.12) = \$2,410.71$$

52. Suppose you have an opportunity to invest in a project, which is expected to generate \$6,800 in year 1, \$7,200 in year 2, and \$7,500 in year 3. The appropriate risk-adjusted discount rate for the project is 10.5 percent. What is project's initial investment when the project's NPV is \$2,609.25? Assume the tax rate is zero.

A. \$15,000.00

B. \$17,609.25

C. \$20,218.50

D. \$21,500.00

Answer: A Type: Calculation Difficulty: Medium LO: 13.2

$$CF_0 = -\$2,609.25 + \frac{\$6,800}{1.105} + \frac{\$7,200}{1.105^2} + \frac{\$7,500}{1.105^3} = \$15,000$$

A.

B. PV of future CFs

C. NPV is added to the PV of future CFs instead of being subtracted from it

D. Sum of future CFs

53. Suppose you have an opportunity to invest in a project, which is expected to generate \$6,800 in year 1, \$7,200 in year 2, and \$7,500 in year 3. The appropriate risk-adjusted discount rate for the project is 10.5 percent. The project's initial investment is \$15,000. What is the profitability index?

A. 1.29

B. 1.17

C. 0.85

D. 0.17

Answer: B Type: Calculation Difficulty: Medium LO: 13.2

$$A. 6800(1+10.5\%)^1 + 7200(1+10.5\%)^2 + 7500(1+10.5\%)^3 - 15000 = 1.29$$

$$B. 6800(1+10.5\%)^1 + 7200(1+10.5\%)^2 + 7500(1+10.5\%)^3 - 15000 = 1.17$$

$$C. 15000 - 6800(1+10.5\%)^1 - 7200(1+10.5\%)^2 - 7500(1+10.5\%)^3 = 0.85$$

$$D. 6800(1+10.5\%)^1 + 7200(1+10.5\%)^2 + 7500(1+10.5\%)^3 - 15000 = 15000 = 0.17$$

54. Suppose you have an opportunity to invest in a project, which requires an after-tax incremental cash outlay of \$25,000 today. The project is expected to generate after-tax cash flows of \$7,500 per year for the next six years. What is the project's NPV if the appropriate discount rate is 15 percent?

- A. \$141.16
- B. \$3,383.62
- C. \$7,641.63
- D. \$10,883.62

Answer: B Type: Calculation Difficulty: Easy LO: 13.2

How options were determined:

- A. NPV = -25,000 + PV of 5 payment ordinary annuity
- B. NPV = -25,000 + PV of 6 payment ordinary annuity of \$7,500 per year at 15%.
- C. NPV = -25,000 + PV of annuity due = \$7,641.63
- D. NPV = -25,000 + PV of 7 payment annuity due = \$10,883.62

55. Consider a project that would change the way your company is doing business. Investing \$100,000 would save your company \$10,000 a year forever. Calculate the NPV of this project if the risk adjusted rate is 10%.

- A. \$10,000
- B. \$100,000
- C. 0
- D. \$ -90,000

Answer: C Type: Calculation Difficulty: Medium LO: 13.2

$$A. 10000 \cdot 1 = 10000$$

$\frac{10,000}{10\%} - 100,000 = 0$

C.

$$D. 10000 \cdot 1 - 100000 = -90000$$

56. Suppose you have an opportunity to invest in a project, which requires an after-tax incremental cash outlay of \$25,000 today. The project is expected to generate its first cash flow

of \$8,000 two years from now, which will remain the same for the following ten years. What is the project's NPV if the appropriate discount rate is 14 percent?

A. \$7,109.05

B. \$9,236.48

C. \$11,604.32

A) **D. \$16,728.93**

Answer: C Type: Calculation Difficulty: Easy LO: 13.2

How options were determined:

$$NPV = -\$25,000 + \frac{\$8,000 * PVA(14\%, 10)}{1.14} = \$11,604.32$$

C.

D. All future CFs under-discounted by $(1+k)$ in the NPV computation

57. Use the following statements to answer the question:

I. The IRR of a project that has a profitability index equal to 1 is equal to the risk adjusted rate.

II. The IRR and NPV results can be contradictory

A. I and II are correct

B. I and II are incorrect

C. I is correct and II is incorrect

D. I is incorrect and II is correct

Answer: A Type: Concept Difficulty: Medium LO: 13.2

58. Consider a twelve-year project that costs \$48,000 today and will produce after-tax cash flows of \$6,000 each year for the first four years, \$7,000 each year for the next four years, and \$8,000 each year for the last four years. If the cost of capital is 8 percent, what is the project's NPV?

A. -\$30,092.41

B. \$907.11

C. \$3,229.86

D. \$21,554.66

Answer: C Type: Calculation Difficulty: Difficult LO: 13.2

$$NPV = -48,000 + \frac{6,000}{1.08} + \frac{7,000}{1.08^2} + \frac{8,000}{1.08^3} = -\$30,092.41$$

$$NPV = -48,000 + 6,000PVA(8\%, 4) + \frac{7,000PVA(8\%, 4)}{1.08^5} + \frac{8,000PVA(8\%, 4)}{1.08^6}$$

$$NPV = -48,000 + 6,000PVA(8\%, 4) + \frac{7,000PVA(8\%, 4)}{1.08^4} + \frac{8,000PVA(8\%, 4)}{1.08^8}$$

$$NPV = -48,000 + 6,000PVA(8\%, 4) + \frac{7,000PVA(8\%, 4)}{1} + \frac{8,000PVA(8\%, 4)}{1}$$

D.

59. Vancouver Salmon Farm Inc.'s current operations will generate cash flows of \$100,000 in year one, \$115,000 in year two, and \$125,000 in year three. The company is considering a new investment, which requires an immediate cash outlay of \$300,000. With the new investment, the company can instead expect to have cash flows of \$250,000 per year for the next three years. The appropriate discount rate is 15 percent. What is the NPV of the new investment?

- A. \$14,703.71
- B. \$65,439.36
- C. \$256,107.57
- D. \$270,806.28

Answer: A Type: Calculation Difficulty: Medium LO: 13.2

$NPV = -\$300,000 + \frac{\$(250,000 - 100,000)}{1.15} + \frac{\$(250,000 - 115,000)}{1.15^2} + \frac{\$(250,000 - 125,000)}{1.15^3}$ $= \$14,703.71$

- A.
- C. PV of current cash flows of \$100,000; \$115,000 and \$125,000 = \$256,102.57
- D. NPV computed from future CFs of \$250,000 for 3 years

60. What is the discounted payback period of a project whose profitability index is higher than 1?

- A. Lower than 1
- B. Higher than 1
- C. Lower than the project life time
- D. Higher then the project life time

Answer: C Type: Concept Difficulty: Easy LO: 13.2

61. What is the discounted payback period of a project whose NPV is positive?

- A. Lower than 1
- B. Higher than 1
- C. Lower than the project life time
- D. Higher then the project life time

Answer: C Type: Concept Difficulty: Easy LO: 13.2

62. What is the payback period of a project whose NPV is positive?

- A. Lower than 1
- B. Higher than 1
- C. Lower than the project life time
- D. Higher then the project life time

Answer: C Type: Concept Difficulty: Easy LO: 13.2

63. What is the project's NPV if it requires an initial cash outlay of \$50,000 and pays \$8,000 per year indefinitely? Assume the appropriate discount rate is 15 percent and the tax rate is zero.

- A. -\$3,623.19
- B. \$1,479.82
- C. \$3,333.33
- D. \$53,333.33

Answer: C Type: Calculation Difficulty: Easy LO: 13.2

How options were determined:

$$NPV = -\$50,000 + \frac{\$8,000}{15\%} = \$3,333.33$$

C.

D. $\$8,000/.15 = \$53,333.33$

64. What is the IRR of a project which requires an initial cash outlay of \$12,345 and is expected to generate cash flows of \$3,600 a year for three years and then \$4,200 a year for two more years? Assume the tax rate is zero.

A. 14.00%

B. 15.50%

C. 16.20%

D. 17.80%

Answer: C Type: Calculation Difficulty: Easy LO: 13.2

How options were determined:

$$NPV = \$0 = -\$12,345 + \$3,600 * PVAF(IRR, 3) + \frac{\$4,200 * PVAF(IRR, 2)}{(1 + IRR)^3}$$

$$IRR = 16.20\%$$

65. Construct an investment opportunity schedule using the following information on four independent projects:

Project	CF_0	Annual CF	k	Project Life
I	\$4 million	\$1.1 million	10%	5 years
II	\$8 million	\$2.8 million	8%	4 years
III	\$7 million	\$2.1 million	12%	5 years
IV	\$6 million	\$2.0 million	15%	4 years

A. I, II, III, IV

B. II, III, IV, I

C. III, II, IV, I

D. IV, III, II, I

Answer: C Type: Calculation Difficulty: Medium LO: 13.4

How the answer was determined:

C. Project I's IRR = 11.65%, project II's IRR = 14.96%, project III's IRR = 15.24%, and project IV's IRR = 12.59%. An investment opportunity schedule = IRR's ranked in descending order = III, II, IV, I

66. What is the IRR of the project, which requires an investment of \$9,900.39 today and will generate \$1,500 per year for ten years and an additional \$10,000 at the end of the tenth year?

A. 8.37%

B. 11.75%

C. 14.43%

B) D. 15.20%

Answer: D Type: Calculation Difficulty: Medium LO: 13.2

How options were determined:

A. IRR without the additional CF of \$10,000 at the end of the tenth year

B. Arbitrary

C. IRR from 9 CFs of \$1,500 and one final CF of \$10,000

$$NPV = 0 = -\$9,900.39 + \$1,500 * PVAF(IRR, 10) + \$10,000 * PVIF(IRR, 10)$$

$$IRR = 15.20\%$$

67. A company is considering two separate, mutually exclusive projects Adept and Boffo. Project Adept requires an initial investment of \$100,000 and is expected to generate after-tax cash flows of \$45,000 per year for three years. Project Boffo requires an initial investment of \$150,000 and is expected to generate after-tax cash flows of \$50,000 per year for four years. The appropriate discount rate is 10 percent. What is the crossover rate for projects Adept and Boffo?

C) A. 4.06%

B. 7.77%

C. 12.59%

D. 16.65%

Answer: B Type: Calculation Difficulty: Medium LO: 13.2

How options were determined:

A. $IRR_{Adept} - IRR_{Boffo}$

B. Crossover rate (CR) = IRR of the incremental project (Boffo – Adept)

CFs of project (Boffo – Adept): -\$50,000, \$5,000, \$5,000, \$5,000, and \$50,000

 $NPV = 0 = -\$50,000 + \$5,000 * PVAF(CR, 3) + \$50,000 * PVIF(CR, 4)$

CR = 7.77%

C. IRR_{Boffo} D. IRR_{Adept}

68. Suppose project Acquisition and project Merger are mutually exclusive. Project Acquisition requires an initial cash outlay of \$50,000 and is expected to provide after-tax cash flows of \$15,000 in year 1, \$25,000 in year 2, \$20,000 in year 3, and \$15,000 in year 4. Project Merger requires an initial cash outlay of \$75,000 and is expected to provide after-tax cash flows of \$20,000 in year 1, \$28,000 in year 2, \$35,000 in year 3, and \$20,000 in year 4. The appropriate discount rate is 12 percent. What is the crossover rate?

A. 4.30%

B. 4.87%

C. 13.72%

D. 18.59%

Answer: A Type: Calculation Difficulty: Medium LO: 13.2

How options were determined:

A. Crossover rate (CR) = IRR of the incremental project (Merger – Acquisition)

$$NPV = 0 = -\$25,000 + \frac{\$5,000}{(1+CR)} + \frac{\$3,000}{(1+CR)^2} + \frac{\$15,000}{(1+CR)^3} + \frac{\$5,000}{(1+CR)^4}$$

$$CR = 4.30\%$$

$$B. IRR_{Acquisition} - IRR_{Merger}$$

$$C. IRR_{Merger}$$

$$D. IRR_{Acquisition}$$

69. Consider a project that requires an investment of \$28,000 today and generates after-tax cash flows of \$10,000 per year for the next four years. The appropriate discount rate is 15 percent.

What are the project's NPV and IRR?

$$A. NPV = -\$264.37; IRR = 14.85\%$$

$$B. NPV = \$335.92; IRR = 15.34\%$$

$$C. NPV = \$549.78; IRR = 15.97\%$$

$$D. NPV = \$738.26; IRR = 16.13\%$$

Answer: C Type: Calculation Difficulty: Medium LO: 13.2

How options were determined:

$$C. NPV = -\$28,000 + \$10,000 \cdot PVAF(15\%, 4) = \$549.78$$

$$NPV = 0 = -\$28,000 + \$10,000 \cdot PVAF(IRR, 4); IRR = 15.97\%$$

70. Consider a five-year project that costs \$20,000 today, which is expected to generate \$6,000 at the end of the second year and then the cash flows will increase by \$1,000 per year for each of the subsequent years. The cost of capital is 8 percent. What are the project's NPV and IRR?

$$A. NPV = \$1,083.24; IRR = 8.96\%$$

$$B. NPV = \$2,706.35; IRR = 11.93\%$$

$$C. NPV = \$3,824.56; IRR = 14.87\%$$

$$D. NPV = \$4,522.85; IRR = 17.09\%$$

Answer: B Type: Calculation Difficulty: Difficult LO: 13.2

$$NPV = -\$20,000 + \frac{\$6,000}{(1+IRR)^2} + \frac{\$7,000}{(1+IRR)^3} + \frac{\$8,000}{(1+IRR)^4} + \frac{\$9,000}{(1+IRR)^5} = \$0$$

$$IRR = 11.93\%$$

B.

D. All future CFs under-discounted by one time factor in the NPV/IRR computations

71. Consider a ten-year project that costs \$40,000 today, which is expected to generate \$6,000 at the end of the second year and then the cash flows will increase by \$1,000 for three years then stagnate for the rest of the project life. The cost of capital is 8 percent. What is the project's NPV?

$$A. \$14,897.61$$

$$B. \$12,718.24$$

$$C. \$7,162.69$$

$$D. \$3,764.73$$

Answer: C Type: Calculation Difficulty: Difficult LO: 13.2

A. $6000(1+8\%)^2 + 7000(1+8\%)^3 + 8000(1+8\%)^4 + 9000(1+8\%)^5 + 10000(1+8\%)^6 +$

$11000(1+8\%)^7 + 12000(1+8\%)^8 + 13000(1+8\%)^9 + 14000(1+8\%)^{10} - 40000 = 14897.61$

B. $6000(1+8\%)^1 + 6000(1+8\%)^2 + 7000(1+8\%)^3 + i = 4108000(1+8\%)^i -$

$40000 = 12718.24$

C. $6000(1+8\%)^2 + 7000(1+8\%)^3 + 8000(1+8\%)^4 + i = 5109000(1+8\%)^i -$

$40000 = 7162.69$

D. $6000(1+8\%)^2 + 7000(1+8\%)^3 + i = 4108000(1+8\%)^i - 40000 = 3764.73$

E.

- F. 72. Consider a ten-year project that costs \$40,000 today, which is expected to generate \$6,000 at the end of the second year and then the cash flows will increase by \$1,000 for three years then stagnate for the rest of the project life. The cost of capital is 8 percent. What is the project's IRR?

- G. A. 14.04%
H. B. 13.85%
I. C. 11.17%
J. D. 9.74%

K. Answer: C Type: Calculation Difficulty: Difficult LO: 13.2

L. A. $6000(1+IRR)^1 + 6000(1+IRR)^2 + 7000(1+IRR)^3 + i = 4108000(1+IRR)^i -$

$40000 = 0$ solve for IRR

M. B.

$6000(1+IRR)^2 + 7000(1+IRR)^3 + 8000(1+IRR)^4 + 9000(1+IRR)^5 + 10000(1+IRR)^6$

$+ 11000(1+IRR)^7 + 12000(1+IRR)^8 + 13000(1+IRR)^9 + 14000(1+IRR)^{10} -$

$$\frac{6,000}{(1+IRR)^2} + \frac{7,000}{(1+IRR)^3} + \frac{8,000}{(1+IRR)^4} + \frac{9,000}{(1+IRR)^5} + \sum_{i=6}^{10} \frac{9,000}{(1+IRR)^i} - \$40,000 = 0 \text{ solve for } IRR$$

N. C.

O. D. $6000(1+IRR)^2 + 7000(1+IRR)^3 + 8000(1+IRR)^4 + i = 5109000(1+IRR)^i -$

$40000 = 0$ solve for IRR

P.

Q. 73. Consider a ten-year project that costs \$40,000 today, which is expected to generate \$6,000 at the end of the second year and then the cash flows will increase by \$1,000 for three years then stagnate for the rest of the project life. The cost of capital is 8 percent. What is discounted payback period?

R. A. 8.99

S. B. 7.34

T. C. 7.71

U. D. 7.17

V. Answer: B Type: Calculation Difficulty: Difficult LO: 13.2

W.

X. Years	Y. A	Z. B	AA. C	AB. D
AC. 0	AD.	AE.	AF.	AG. 5555.556
AH. 1	AI.	AJ.	AK.	AL.
AM. 2	AN. 5144.033	AO. 5144.033	AP. 5144.0329	AQ. 10699.59
AR. 3	AS. 10700.86	AT. 10700.86	AU. 10700.859	AV. 16256.41
AW. 4	AX. 16581.1	AY. 16581.1	AZ. 16581.097	BA. 22136.65
BB. 5	BC. 22025.76	BD. 22706.35	BE. 22706.346	BF. 28261.9
BG. 6	BH. 27067.12	BI. 28377.87	BJ. 29008.042	BK. 33933.43
BL. 7	BM. 31735.04	BN. 33629.29	BO. 35426.437	BP. 39184.84
BQ. 8	BR. 36057.19	BS. 38491.71	BT. 41909.663	BU. 44047.26
BV. 9	BW. 40059.19	BX. 42993.95	BY. 48412.9	BZ. 48549.5
CA. 10	CB. 43764.73	CC. 47162.69	CD. 54897.609	CE. 4168.741
CF. 11	CG. 5144.033	CH. 5144.033	CI. 5144.0329	CJ. 5555.556
CK. Discounted Payback Period	CL. 8.99	CM. 8.34	CN. 7.71	CO. 7.17

CP.

CQ. 74. Use the following statements to answer this question:

CR. I. Payback period is always longer than the discounted payback period.

CS.II. Both discounted and payback period ignores cash flows beyond the cut-off period.

CT.A. I and II are correct

CU. B. I and II are incorrect

CV. C. I is correct and II is incorrect

CW. D. I is incorrect and II is correct

CX. Answer: D Type: Concept Difficulty: Medium LO: 13.2

CY.

CZ. 75. What is the payback period of a project, which requires an initial cash outlay of \$16,000 and provides cash flows of \$4,500 in year 1, \$5,500 in year 2, \$6,500 in year 3 and \$7,500 in year 4? Assume the appropriate discount rate is 10 percent.

DA. A. 2.08

D) B. 2.36

DB. C. 2.68

- DC. D. 2.92
 DD. Answer: D Type: Calculation Difficulty: Easy LO: 13.2
 DE. How options were determined
 DF.A. (Accumulated $CF_3 - CF_0$) instead of ($CF_0 - \text{Accumulated } CF_2$) used in the payback

$$\text{Payback period} = 2 + \frac{\$16,000 - \$10,000}{\$6,500} = 2.92$$

- DG. D.
 DH.
 DI. 76. Consider a project that requires an investment of \$22,500 today and pays \$5,250 per year for ten years. What is the payback period of the project? Assume the cost of capital is 12 percent.
 DJ.A. 4.29
 DK. B. 4.52
 DL. C. 4.71
 E) **D. 4.93**
 DM. Answer: A Type: Calculation Difficulty: Easy LO: 13.2

$$\text{Payback period} = 4 + \frac{\$22,500 - \$21,000}{\$5,250} = 4.29$$

- DO. A.
 DP. C. (Accumulated $CF_5 - CF_0$) instead of ($CF_0 - \text{Accumulated } CF_4$) used in the payback computation
 DQ.
 DR. 77. What is the discounted payback period of a five-year project that costs \$18,000 today and pays an annual cash flow of \$7,500? Assume the cost of capital is 15%.
 DS. A. 2.40
 DT. B. 3.12
 DU. C. 3.20
 DV. D. 3.80
 DW. Answer: C Type: Calculation Difficulty: Medium LO: 13.2
 DX. How options were determined:
 DY. A. Regular payback period
 DZ. B. ($CF_0 - PV(\text{Accumulated } CF_3)$) divided by CF_4 instead of $PV(CF_4)$
 EA. C. $PV(CF_{1-4})$: \$6,521.74, \$5,671.08, \$4,931.37, and \$4,288.15

$$\text{Discounted payback period} = 3 + \frac{\$18,000 - \$17,124.19}{\$4,288.15} = 3.20$$

- EC.
 ED. D. ($PV(\text{Accumulated } CF_4) - CF_0$) instead of ($CF_0 - PV(\text{Accumulated } CF_3)$) used in the computation
 EE.
 EF. 78. Consider an investment opportunity that requires an initial cash outlay of \$28,500 and provides cash flows of \$8,500 in year 1, \$10,000 in year 2, \$11,500 in year 3, and

\$13,000 in year 4. The cost of capital is 12 percent. What is the discounted payback period of the project?

EG. A. 2.87

EH. B. 3.37

EI. C. 3.42

EJ. D. 3.58

EK. Answer: D Type: Calculation Difficulty: Medium LO: 13.2

EL. How options were determined:

EM. A. Regular payback period

EN. B. $(CF_0 - PV(\text{Accumulated } CF_3))$ divided by CF_4 instead of $PV(CF_4)$

EO. C. $(PV(\text{Accumulated } CF_4) - CF_0)$ instead of $(CF_0 - PV(\text{Accumulated } CF_3))$ used in the

$$3.58 \text{ Discounted payback period} = 3 + \frac{\$28,500 - \$23,746.70}{\$8,261.74} = 3.58 \text{ Disc}$$

EP. D.

EQ.

ER. 79. Suppose a project requires an after-tax incremental cash outflow of \$40,000 today.

The project is expected to generate after-tax cash inflows of \$9,000 per year for the next six years. What is the project's PI if the appropriate discount rate is 10 percent?

ES. A. 0.92

ET. B. 0.98

EU. C. 1.03

EV. D. 1.11

EW. Answer: B Type: Calculation Difficulty: Easy LO: 13.2

EX. How options were determined:

$$PI = \frac{\$39,197.35}{\$40,000} = 0.98$$

EZ.

FA.

FB. 80. Consider a project that requires an immediate cash outflow of \$100,000 and provides a perpetual annual inflow of \$15,000 starting two years from today. The cost of capital is 12 percent. What is the project's PI?

FC. A. 1.04

FD. B. 1.12

FE. C. 1.25

FF. D. 1.33

FG. Answer: B Type: Calculation Difficulty: Medium LO: 13.2

$$PV_1(CF_2) = \frac{\$15,000}{0.12} = \$125,000; PV_0(CF_2) = \frac{\$125,000}{1.12} = \$111,607.14$$

$$PI = \frac{\$111,607.14}{\$100,000} = 1.12$$

FJ.

FK. C. $PV_1(CFs)$ divided by CF_0

FL.

FM.81. Rank the following projects by their PIs in descending order:

FN.

FO. Project	FP. CF_0	FQ. NPV
FR.I	FS. \$100,000	FT. \$12,345
FU. II	FV. \$125,000	FW. \$21,338
FX. III	FY. \$75,000	FZ. \$10,467
GA. IV	GB. \$135,000	GC. \$24,680

GD.

GE. A. I, II, III, IV

GF.B. II, III, I, IV

GG. C. III, I, IV, II

GH. D. IV, II, III, I

GI. Answer: D Type: Calculation Difficulty: Medium LO: 13.2

GJ. How answer was determined:

GK. D. $PI = (CF_0 + NPV) / CF_0$

GL. Project IV's $PI = (\$135,000 + \$24,680) / \$135,000 = 1.18$

GM. Project II's $PI = (\$125,000 + \$21,338) / \$125,000 = 1.17$

GN. Project III's $PI = (\$75,000 + \$10,467) / \$75,000 = 1.14$

GO. Project I's $PI = (\$100,000 + \$12,345) / \$100,000 = 1.12$

GP.

GQ.82. A company is considering four separate, mutually exclusive projects A, B, C, and D. Project A requires an initial investment of \$100,000 and is expected to generate after-tax cash flows of \$62,500 per year for two years. Project B requires an initial investment of \$160,000 and is expected to generate after-tax cash flows of \$72,000 per year for three years. Project C requires an initial investment of \$125,000 and is expected to generate \$45,000 per year for four years. Project D requires an initial investment of \$200,000 and is expected to generate after-tax cash flows of \$87,500 per year for three years. The appropriate discount rate is 10 percent. Rank the projects by their PIs in descending order.

GR. A. A, B, C, D

GS. B. B, C, A, D

GT. C. C, B, D, A

GU. D. D, A, B, C

GV. Answer: C Type: Calculation Difficulty: Difficult LO: 13.2

GW. How answer was determined:

$$= \frac{\$45,000 * PVAF(10\%, 4)}{\$125,000} = 1.14$$

$$= \frac{\$72,000 * PVAF(10\%, 3)}{\$160,000} = 1.12$$

GZ. Project B's PI

$$= \frac{\$87,500 * PVAF(10\%, 3)}{\$200,000} = 1.09$$

HA. Project D's PI

$$= \frac{\$62,500 * PVAF(10\%, 2)}{\$100,000} = 1.08$$

HB. Project A's PI

HC.

HD.83. What is the PI of a project that requires an initial investment of \$36,000 and pays \$10,000 in year 1, \$18,000 in year 2, \$15,000 in year 3, and \$12,000 in year 4? Assume the discount rate is 9 percent and the tax rate is zero.

HE. A. 1.05

HF.B. 1.16

HG. C. 1.23

HH. D. 1.38

HI. Answer: C Type: Calculation Difficulty: Easy LO: 13.2

HJ. How answer was determined:

$$PI = \frac{\frac{\$10,000}{1.09} + \frac{\$18,000}{1.09^2} + \frac{\$15,000}{1.09^3} + \frac{\$12,000}{1.09^4}}{\$36,000} = 1.23$$

HL.

HM.

HN. **Section 13.3 Independent and interdependent projects**

HO.84. Which of the following are NOT contingent projects?

HP.A. Buying a truck and a trailer.

HQ. B. Selling canoes and paddles.

HR. C. Manufacturing milk and butter.

HS. D. Manufacturing baby food and applesauce.

HT. Answer: D Type: Concept Difficulty: Easy LO: 13.3

HU.

HV.85. The investment rule for contingent projects is:

HW. A. Accept the projects only if all of the individual NPVs are positive.

HX. B. Accept the projects even if all of the individual NPVs are negative.

HY. C. Accept the projects only if the total NPV of all projects is positive.

HZ. D. Accept the projects even if the total NPV of all projects is negative.

IA. Answer: C Type: Concept Difficulty: Easy LO: 13.3

IB.

IC.86. Mutually exclusive projects with unequal lives can be compared by using:

ID. A. The NPV approach

IE. B. The IRR approach

IF. C. The PI approach

IG. D. The chain replication approach

IH. Answer: D Type: Concept Difficulty: Easy LO: 13.3

II.

IJ.87. Which of the following statements is TRUE?

- IK. A. Contingent projects are projects for which the acceptance of one requires the acceptance of another, either beforehand or simultaneously.
- IL. B. The Chain replication approach is a way to compare projects with equal lives by finding a time horizon into which all the project lives under consideration divide equally, and then assuming each project repeats until it reaches this horizon.
- IM. C. The Equivalent annual NPV approach is a way to compare projects by finding the NPV of the individual projects, and then determining the amount of an annual annuity that is economically equivalent to the PV generated by each project over its respective time horizon.
- IN. D. Mutually exclusive projects require the firm to choose one project over another unless both projects generate positive NPVs.
- IO. Answer: A Type: Concept Difficulty: Difficult LO: 13.3
- IP.
- IQ. 88. Use these statements to answer the following question:
- IR. I. Contingent projects are evaluated independently and should be accepted independently.
- IS. II. When considering contingent projects, all projects should have a positive NPV.
- IT. A. I and II are correct
- IU. B. I and II are incorrect
- IV. C. I is correct and II is incorrect
- IW. D. I is incorrect and II is correct
- IX. Answer: D Type: Concept Difficulty: Medium LO: 13.3
- IY.
- IZ. 89. A company must choose between two mutually exclusive projects: Alpha and Bravo, to enhance its current operations. Project Alpha requires a \$12,000 cash outlay today and is expected to generate after-tax cash flows of \$6,000 in year 1, \$6,500 in year 2, and \$7,000 in year 3. Project Bravo requires a \$20,000 cash outlay today and is expected to generate after-tax cash flows of \$7,000 in year 1, \$8,000 in year 2, \$9,000 in year 3 and \$8,000 in year 4. The appropriate discount rate is 10 percent. Which project should the firm choose? Assume both projects can be replicated.
- JA. A. Total NPV_{Alpha}=\$11,194 > total NPV_{Bravo}=\$11,180 over a 12-year time horizon, choose project Alpha
- JB. B. Total NPV_{Alpha}=\$16,343 > total NPV_{Bravo}=\$15,603 over a 12-year time horizon, choose project Alpha
- JC. C. Total NPV_{Bravo}=\$11,194 > total NPV_{Alpha}=\$11,180 over a 12-year time horizon, choose project Bravo
- JD. D. Total NPV_{Bravo}=\$16,343 > total NPV_{Alpha}=\$15,603 over a 12-year time horizon, choose project Bravo
- JE. Answer: A Type: Calculation Difficulty: Difficult LO: 13.3

$$= -\$12,000 + \frac{\$6,000}{1.10} + \frac{\$6,500}{1.10^2} + \frac{\$7,000}{1.10^3} = \$4,085.65$$

JG. A. Project Alpha's NPV

JH. Project Alpha's total NPV over a 12-year time horizon

JI. = \$4,085.65 + \$4,085.65*PVIF(10%,3) + \$4,085.65*PVIF(10%,6) + \$4,085.65*PVIF(10%,9)

JJ. = \$11,194

$$= -\$20,000 + \frac{\$7,000}{1.10} + \frac{\$8,000}{1.10^2} + \frac{\$9,000}{1.10^3} + \frac{\$8,000}{1.10^4} = \$5,201.15$$

JK. Project Bravo's NPV

JL. Project Bravo's total NPV over a 12-year time horizon

JM. $= \$5,201.15 + \$5,201.15 \times \text{PVIF}(10\%, 4) + \$5,201.15 \times \text{PVIF}(10\%, 8) = \$11,180$

JN. B. Arbitrary

JO. C. Reverse of A

JP. D. Reverse of B

JQ.

JR. 90. A company must choose between two new computer operating systems: Linux and Windows, to replace the existing system to support its ongoing operations. System Linux costs \$50,000 and requires annual maintenance costs of \$6,000 during its four-year life. System Windows costs \$75,000 and requires annual maintenance cost of \$4,500 during its six-year life. The appropriate discount rate is 8 percent. Which system should the firm choose? Assume both systems can be replicated.

JS. A. $\text{EANPV}_L = \$21,096 > \text{EANPV}_W = \$20,724$, choose system Linux

JT. B. $\text{EANPV}_L = \$21,096 > \text{EANPV}_W = \$20,724$, choose system Windows

JU. C. $\text{EANPV}_L = -\$9,096 > \text{EANPV}_W = -\$11,724$, choose system Linux

JV. D. $\text{EANPV}_L = -\$9,096 > \text{EANPV}_W = -\$11,724$, choose system Windows

JW. Answer: B Type: Calculation Difficulty: Difficult LO: 13.3

JX. How options were determined:

JY. A. Incorrect conclusion (reverse of B)

$$= \frac{\$69,872.76}{\text{PVAF}(8\%, 4)} = \$21,096$$

KA. System Alpha's EANPV

$$= \frac{\$95,802.96}{\text{PVAF}(8\%, 6)} = \$20,724$$

KC. System Windows's EANPV

KD. C. PV(future CFs) minus CF_0 instead of plus CF_0 in the NPV computation

KE. D. Reverse conclusion of C

KF.

KG. 91. Suppose the following projects are mutually exclusive. Which project should be chosen if the appropriate discount rate is 10 percent? Assume all projects can be replicated.

KH.

KI. Project	KJ. CF_0	KK. NPV	KL. Project Life
KM. Mars	KN. \$100,000	KO. \$15,500	KP. 4
KQ. Saturn	KR. \$125,000	KS. \$17,250	KT. 6
KU. Venus	KV. \$75,000	KW. \$8,250	KX. 2

KY. Jupiter	KZ. \$135,000	LA. \$20,000	LB. 10

LC.

LD. A. Project Mars

LE.B. Project Saturn

F) **C. Project Venus**

LF.D. Project Jupiter

LG. Answer: A Type: Calculation Difficulty: Medium LO: 13.3

LH. How options were determined:

LI. A. Project Mars's EANPV = $\$15,500 / PVA(10\%,4) = \$4,889.74$ LJ. Project Saturn's EANPV = $\$17,250 / PVA(10\%,6) = \$3,960.69$ LK. Project Venus's EANPV = $\$8,250 / PVA(10\%,2) = \$4,753.67$ LL. Project Jupiter's EANPV = $\$20,000 / PVA(10\%,10) = \$3,254.90$

LM. Choose Project Mars because it has the highest EANPV

LN.

LO. 92. Use the following statements to answer this question:

LP. I. The EANPV is effective in choosing between projects that have different life spans.

LQ. II. The IRR will lead to the same conclusion as EANPV if the two projects are not mutually exclusive and the cash flows are conventional.

LR. A. I and II are correct

LS.B. I and II are incorrect

LT.C. I is correct and II is incorrect

LU. D. I is incorrect and II is correct

LV. Answer: A Type: Concept Difficulty: Medium LO: 13.3

LW.

LX. 93. What is the EANPV of a project that requires an initial investment of \$42,000 and costs \$10,000 per year for 8 years? Assume the discount rate is 14 percent and the tax rate is zero.

LY.A. \$946

LZ.B. \$11,049

MA. C. \$19,054

MB. D. \$88,389

MC. Answer: C Type: Calculation Difficulty: Medium LO: 13.3

MD. How options were determined:

ME. A. $PV(\text{future CFs})$ minus CF_0 instead of plus CF_0 in the NPV computationMF. B. $NPV / 8$ MG. C. $NPV = \$42,000 + \$10,000 * PVA(14\%,8) = \$88,389$ MH. $EANPV = \$88,389 / PVA(14\%,8) = \$19,054$

MI.D.NPV

MJ.

MK. **Section 13.4 Capital Rationing**ML.94. Which of the following is **NOT** true when a firm faces capital budget constraints?G) **A. Capital rationing prevails.**

MM. B. Independent projects that generate positive NPV's may not be accepted.

MN. C. Investment capital must be rationed amongst available investment projects.

MO. D. All the projects listed on its investment opportunity schedule until the IRR equals its WACC will be accepted.

MP. Answer: D Type: Concept Difficulty: Medium LO: 13.4

MQ.

MR. 95. In the presence of capital rationing:

MS. A. the cost of capital is no longer the appropriate opportunity cost.

MT. B. firms can fully rely on either IRR or NPV as a criterion.

MU. C. PIs are often useful to conclude on the optimal solution.

MV. D. the investment decision should be based on which combination of projects generates the highest total NPV, regardless of the cost of the investment.

MW. Answer: A Type: Concept Difficulty: Medium LO: 13.4

MX.

MY.96. You must choose between the following projects. Project Alpha requires an initial investment of \$10 million and provides an NPV of \$4 million. Project Bravo requires an investment of \$7 million and provides an NPV of \$4 million. Project Charlie requires an investment of \$8 million and provides an NPV of \$4 million. Project Delta, contingent on project Alpha, requires an investment of \$5 million and provides an NPV of \$4.5 million. If you only have \$15 million in available capital, which projects will you select?

MZ. A. Projects Alpha and Delta

NA. B. Projects Bravo and Charlie

NB. C. Projects Bravo and Delta

NC. D. Projects Charlie and Delta

ND. Answer: A Type: Calculation Difficulty: Medium LO: 13.4

NE. How options were determined:

NF.A. Total NPV of projects Alpha and Delta combined = \$4,000,000 + \$4,500,000 = \$8,500,000, is greater than the \$8,000,000 total NPV of projects Bravo and Charlie combined. Given project Delta is contingent on project Alpha, it cannot be combined with project Bravo or Charlie alone

NG.

NH.97. A firm has set a budget constraint of \$220,000 on new investments, which cannot be exceeded. Given the following independent investments, which projects should the firm undertake?

NI. Project	NJ. CF_0	NK. PI
NL. Alpha	NM. \$80,000	NN. 1.20
NO. Delta	NP. \$120,000	NQ. 1.13
NR. Gamma	NS. \$140,000	NT. 1.10
NU. Sigma	NV. \$85,000	NW. 1.15

NX.

NY. A. Projects Alpha and Delta

NZ. B. Projects Alpha and Gamma

OA. C. Projects Alpha and Sigma

OB. D. Projects Venus and Jupiter

OC. Answer: A Type: Calculation Difficulty: Difficult LO: 13.4

OD. How options were determined:

OE. A. Project NPV = $CF_0 * PI - CF_0$

OF. Project Alpha's NPV = \$16,000; project Delta's NPV = \$15,600; project Gamma's NPV = \$14,000, and project Sigma's NPV = \$12,750. The total NPV of projects Alpha and Delta combined = \$31,600, is the highest total NPV among the other possible combinations within the budget constraint

OG.

OH. 98. A firm has set a budget constraint of \$220,000 on new investments, which cannot be exceeded. Given the following independent investments, what is the highest NPV that the firm will get?

OI. Project	OJ. CF_0	OK. PI
OL. Mars	OM. \$80,000	ON. 1.20
OO. Venus	OP. \$120,000	OQ. 1.13
OR. Saturn	OS. \$140,000	OT. 1.10
OU. Jupiter	OV. \$85,000	OW. 1.15

OX. A. \$ 31,600

OY. B. \$ 28,000

OZ. C. \$ 28,750

PA. D. \$ 28,350

PB. Answer: A Type: Calculation Difficulty: Difficult LO: 13.4

PC. How options were determined:

PD. Project NPV = $CF_0 * PI - CF_0$

PE. Project Mars' NPV = \$16,000; project Venus' NPV = \$15,600; project Saturn's NPV = \$14,000, and project Jupiter's NPV = \$12,750.

PF. A. 16000+15600

PG. B. 16000+14000

PH. C. 16000+12750

PI. D. 15600+12750

PJ.

PK. 99. A firm has set a budget constraint of \$220,000 on new investments, which cannot be exceeded. Given the following independent investments, which one of the following combination is part of the investment opportunity schedule?

PL.

PM. Project	PN. CF_0	PO. PI
PP. Mars	PQ. \$80,000	PR. 1.20
PS. Venus	PT. \$120,000	PU. 1.13

PV. Saturn	PW. \$140,000	PX. 1.10
PY. Jupiter	PZ. \$85,000	QA.

QB.

QC. A. Saturn and Venus

QD. B. Mars and Jupiter

QE. C. Mars and Saturn

QF. D. Saturn and Jupiter

QG. Answer: B Type: Calculation Difficulty: Difficult LO: 13.4

QH.

QI. 100. A firm has set a budget constraint of \$200,000 on new investments, which cannot be exceeded. Given the following independent investments, what is the loss to the firm from the capital rationing constraint?

QJ.

QK. Project	QL. CF_0	QM. NPV
QN. Alpha	QO. \$70,000	QP. \$9,238
QQ. Delta	QR. \$50,000	QS. \$6,500
QT. Gamma	QU. \$150,000	QV. \$25,000
QW. Sigma	QX. \$80,000	QY. \$11,262

QZ.

RA. A. \$15,738

RB. B. \$17,762

RC. C. \$20,500

RD. D. \$31,500

RE. Answer: C Type: Calculation Difficulty: Medium LO: 13.4

RF. How options were determined:

RG. C. The total NPV of projects Gamma and Delta combined = \$31,500, is the highest total NPV among the other possible combinations within the budget constraint. The loss to the company is the total NPVs of the foregone projects Alpha and Delta = \$9,238 + \$11,262 = \$20,500

RH.

RI. 101. A firm has a budget constraint of \$40 million to invest in new projects. Given the following information on five independent projects, which projects should the firm undertake?

RJ.

RK. Project	RL. CF_0	RM. Annual CF	RN. k	RO. Project Life
RP. Alpha	RQ. \$10	RR. \$5	RS. 11%	RT. 3 years

	million	million		
RU. Delta	RV.\$15 million	RW. \$6 million	RX. 13%	RY.4 years
RZ. Gamma	SA. \$25 million	SB.\$7 million	SC.10%	SD. 5 years
SE.Sigma	SF.\$30 million	SG. \$8 million	SH. 12%	SI. 6 years

SJ.

SK. A. Projects Alpha and Delta

SL.B. Projects Alpha and Gamma

SM. C. Projects Alpha and Sigma

SN. D. Projects Venus and Saturn

SO. Answer: C Type: Calculation Difficulty: Difficult LO: 13.4

SP. How answer was determined:

SQ. C. Project's NPV = $-CF_0 + \text{annual CF} \cdot PVAF(k,n)$

SR. Project Alpha's NPV = \$2,218,574; project Delta's NPV = \$2,846,828; project Gamma's NPV = \$1,535,507; project Sigma's NPV = \$2,891,259. The total NPV of projects Alpha and Sigma combined = \$5,109,833, is the highest total NPV among the other possible combinations within the budget constraint.

SS.

ST. 102. A firm has a budget constraint of \$35 million to invest in new projects. Given the following information on four independent projects, what is the loss to the firm from the capital rationing constraint?

SU.

SV.Proje ct	SW. CF ₀	SX. Annual CF	SY.k	SZ.Proje ct Life
TA. Alpha	TB. \$10 million	TC. \$3 million	TD. 10%	TE.6 years
TF.Bravo	TG. \$15 million	TH. \$5 million	TI. 11%	TJ. 5 years
TK. Ceta	TL.\$20 million	TM. \$9 million	TN. 9%	TO. 3 years

TP. Delta	TQ. \$25 million	TR. \$8 million	TS. 8%	TT. 4 years

TU.

TV.A. \$4,278,667

TW. B. \$4,562,797

TX. C. \$5,847,434

TY.D. \$6,545,267

TZ. Answer: A Type: Calculation Difficulty: Difficult LO: 13.4

UA. How options were determined:

UB. A. Project's NPV = $-CF_0 + \text{annual CF} \cdot PVAF(k,n)$

UC. Project Alpha's NPV = \$3,065,782; project Bravo's NPV = \$3,479,485; project Ceta's NPV = \$2,781,652; and project Delta's NPV = \$1,497,015. The total NPV of projects Alpha and Bravo combined = \$6,545,267, is the highest total NPV among the other possible combinations within the budget constraint. The loss to the company is the total NPVs of the foregone projects Ceta and Delta = $\$2,781,652 + \$1,497,015 = \$4,278,667$

UD. B. Alpha NPV + Delta NPV

UE. C. Alpha NPV + Ceta NPV

UF.D. Alpha NPV + Bravo NPV

UG.

UH. 103. Which of the following about a firm's weighted average cost of capital (WACC) is **FALSE**?

UI. A. It is the after-tax cost of the average dollar of long-term financing to the firm.

UJ. B. It is the appropriate discount rate to evaluate long-term investment projects.

UK. C. It is the appropriate discount rate to evaluate typical investment projects.

UL. D. It is the appropriate discount to evaluate atypical investment projects.

UM. Answer: D Type: Concept Difficulty: Easy LO: 13.4

UN.

UO. 104. If a firm uses a constant WACC to select investments projects, it will:

UP.A. always make appropriate decisions.

UQ. B. not accept negative NPV high-risk projects.

UR. C. not reject positive NPV low-risk projects.

US. D. cause the market price of its debt and equity securities to decline.

UT. Answer: D Type: Concept Difficulty: Difficult LO: 13.4

UU.

UV. 105. Which of the following is **NOT** an approach to estimate risk adjusted discount rates for an **atypical** investment?

UW. A. Estimating the weighted average cost of capital of firms in an industry associated with the project.

UX. B. Adjusting the firm's cost of capital up or down based on the risk level and financing of the project.

UY. C. Estimating betas and the risk associated with the firm's overall investments.

UZ. D. Estimating beta for the project by regressing the ROA of the project against the ROA of the market index.

VA. Answer: C Type: Concept Difficulty: Medium LO: 13.4

VB.

VC. 106. Use the following statements to answer these questions:

VD. I. Everything else held constant, increasing the proportion of debt in the project would increase the WACC.

VE. II. A typical project of the company should be discounted using a risk adjusted rate different than the WACC.

VF. A. I and II are correct

VG. B. I and II are incorrect

VH. C. I is correct and II is incorrect

VI. D. I is incorrect and II is correct

VJ. Answer: B Type: Concept Difficulty: Medium LO: 13.4

VK.

VL. 107. Fussy, Inc. is composed of two different divisions: food catering and shoe making.

The company's overall WACC is 10 percent, while the WACC for the food catering division is 9 percent and for the shoe making division is 12 percent. What would happen if the company used the overall WACC in the valuation of the following independent projects?

VM.

VN. Project	VO. Industry	VP. CF_0	VQ. Annual CF	VR. Project Life
VS. I	VT. Food caterin g	VU. \$400,000	VV. \$125,000	VW. 4 years
VX. II	VY. Shoe makin g	VZ. \$600,000	WA. \$150,000	WB. 6 years
WC. III	WD. Shoe makin g	WE. \$500,000	WF. \$135,000	WG. 5 years
WH. IV	WI. Food caterin g	WJ. \$800,000	WK. \$170,000	WL. 6 years

WM.

WN. A. Incorrectly accept project III and reject project IV

WO. B. Incorrectly accept projects II and III

WP. C. Incorrectly reject project I and accept project III

WQ. D. Incorrectly reject projects I and IV

WR. Answer: C Type: Calculation Difficulty: Medium LO: 13.4

WS. How options were determined:

WT. C. Project's NPV = $-CF_0 + \text{Annual } CF \cdot PVAF(k, n)$

W U. Pr	WV. Industry	WW. NPV WX. $k=10$ %	WY. NPV WZ. $k=9$ %	XA. NPV XB. $k=12$ %	XC.
X D. I	XE. Food cateri ng	XF. – \$ 3, 7 6 7	XG. \$4,96 5	XH.	XI. inc orr ect ly rej ect ed
XJ . II	XK. Shoe makin g	XL. \$53,2 8 9	XM.	XN. \$16,71 1	XO.
XP . III	XQ. Shoe makin g	XR. \$11,7 5 6	XS.	XT. – \$1 3,3 55	XU. incore ctl y acc ept ed
XV . IV	XW. Food cateri ng	XX. – \$ 5 9, 6 0 6	XY. – \$ 3 7, 3 9 4	XZ.	YA.

YB.

YC. 108. Northwest Territories Holding Corporation is comprised of two different divisions: car rental and furniture manufacturing. Two-thirds of the company's business comes from the furniture manufacturing division and the balance from the car rental division. The WACC for the car rental division is 9 percent and for the furniture manufacturing division is 15 percent. What would happen if the company used the overall WACC in the valuation of the following independent projects?

YD.

YE. Proje ct	YF. Industry	YG. CF_0	YH. nnual CF	YI. Project Life
YJ. I	YK. Car rental	YL. \$1 milli on	YM. 270,00 0	YN. 5 years

YO. II	YP.Furniture manufacturing	YQ. \$3 milli on	YR. 765,00 0	\$ YS. years	6
YT. III	YU. Car rental	YV. \$2 milli on	YW. 510,00 0	\$ YX. years	6
YY. IV	YZ. Furniture manufacturing	ZA. \$4 milli on	ZB. 1,500, 000	\$ ZC. years	4

ZD.

ZE.A. Incorrectly accept project II and reject project I

ZF. B. Incorrectly accept projects II and IV

ZG. C. Incorrectly reject project I and III

ZH. D. Incorrectly reject project III and accept IV

ZI. Answer: A Type: Calculation Difficulty: Difficult LO: 13.4

ZJ. How options were determined

ZK. A. Company's overall WACC = $15\% \cdot (2/3) + 9\% \cdot (1/3) = 13\%$ ZL. Project's NPV = $-CF_0 + \text{Annual CF} \cdot \text{PVAF}(k,n)$

ZM.

ZN. Pr	ZO. Indu stry	ZP. NP V ZQ. k=13 %	ZR. NPV ZS. = 9 %	ZT. NP V ZU. k=15%	ZV.
Z W. I	ZX. Car rental	ZY. \$ 5,00, 348	ZZ. \$ 5,00, 346	AAA.	AAB. incorrectl y reject ed
A A C. II	AAD. Furn iture manufacturi ng	AAE. \$5,8, 126	AAF.	AAG. -\$10, 4871	AAH. incorrectl y accept ed
A AI. III	AAJ. Car rental	AAK. \$3,8,	AAL. \$28	AAM.	AAN.

		7 5 0	7, 8 1 8		
A A O. IV	AAP. Furniture manufacturing	AAQ \$461,707	AAR	AAS. \$282,468	AAT.

AAU.

AAV. 109. Thunder Bay Entertainment Inc. has two separate divisions: DVD rental and sporting goods. The beta of the entire company is 1.25. The beta of the DVD rentals division is 0.8 and the beta of the sporting goods division is 1.5. The risk free rate is 4 percent and the market risk premium is 7.5 percent. Which of the following independent projects should the company undertake?

AAW.

AA X. P r o j e c t	AAZ. CF_0	ABA. Perpetual annual CF
AB B. I	ABD. \$150,000	ABE. \$25,000
AB F. I	ABH. \$200,000	ABI. \$30,000
ABJ . I	ABL. \$50,000	ABM. \$6,000
AB N. I	ABP. \$80,000	ABQ. \$7,500

ABR.

ABS. A. Projects I and II

ABT. B. Projects I and III

ABU. C. Projects II and IV

ABV. D. Projects III and IV

ABW. Answer: B Type: Calculation Difficulty: Medium LO: 13.4

ABX. How options were determined:

ABY. B. Project's required return = risk free rate + project beta*market risk premium

ABZ. Projects I and II's required return = 15.25%, projects III and IV's required return = 10.00%

ACA.

A CB . Pr	ACC. I industry	ACD. NPV ACE. $k=15.25\%$	ACF. NPV ACG $k=10\%$	AC H.
A CL I	ACJ. S porting goods	ACK. \$13,934	ACL.	AC M. a c c e p t
A C N. II	ACO. S porting goods	ACP. – \$3,279	ACQ	AC R. r e j e c t
A CS . III	ACT. D VD rental	ACU.	ACV. \$10,000	AC W. a c c e p t
A C X. IV	ACY. D VD rental	ACZ.	ADA . – \$5,000	AD B. r e j e c t

ADC.

ADD. 110. Toronto Skaters Corporation has no budget constraint on new investments. The risk free rate is 4 percent and the market risk premium is 6 percent. Which of the following independent projects should the firm undertake?

ADE.

ADF. Project	ADG. Beta	ADH. CF_0	ADI. Annual CF	ADJ. Project Life
ADK. Tango	ADL. 0.8	ADM. \$80,000	ADN. \$30,000	ADO. 4
ADP. Foxtrot	ADQ. 1.2	ADR. \$120,000	ADS. \$32,000	ADT. 5
ADU. Zulu	ADV. 1.5	ADW. \$60,000	ADX. \$35,000	ADY. 2
ADZ. Whiskey	AEA. 0.9	AEB. \$150,000	AEC. \$65,000	AED. 3

AEE.

AEF. A. Projects Tango and Zulu

AEG. B. Projects Tango and Whiskey

AEH. C. Projects Foxtrot and Zulu

AEI. D. Projects Foxtrot and Whiskey

AEJ. Answer: B Type: Calculation Difficulty: Medium LO: 13.4

AEK. How answer was obtained:

AEL. B. Project's required return = risk free rate + project beta*market risk premium

AEM.

AEN Project	AE OB	AEP. Required return	AE Q. NPV	AE R.
AES Tango	AE T. 0	AEU. .8%	AE V. \$17,620	AE W. ac
AEX Foxtrot	AE Y. 1	AEZ. 1.2%	AF A. -\$2,3	AF B. rej

o t			2 4	
AFC Z u l u	A F D 1	AFE. 1 3.0%	AFF — \$ 1 , 6 1 6	A F G. rej
AFH W h i s k e y	A F I 0	AFJ. 9 .4%	AF K. \$ 1 3 , 3 6 8	A F L. ac

AFM.

AFN.

AFO.

AFP.

AFQ.

AFR.

AFS.

AFT.

AFU.

AFV.

AFW.

AFX.

AFY.

AFZ.

AGA.

AGB.

AGC.

AGD.

AGE.

AGF.

AGG.

AGH.

AGI.

AGJ.

AGK.

Section 13.5 International Considerations

111. Use the following two statements to answer this question:

I. Portfolio flows are investments in financial securities and companies by firms.

II. Foreign direct investments are investments in real assets.

A. I and II are correct.

B. I and II are incorrect.

C. I is correct, II is incorrect.

D. I is incorrect, II is correct.

Answer: D Type: Concept

Difficulty: Medium LO: 13.5

112. Which of the following is a reason(s) that firms make foreign investments?

A. They want to enter new markets.

B. They want to have access to new technology.

C. They want to take advantage of cheaper resources.

D. All of the above

Answer: C

Type: Concept

Difficulty: Medium LO: 13.5

113. Which of the following is **NOT** a risk of foreign direct investment:

A. Conversion risk

B. Default risk

C. Expropriation risk

D. Transfer risk

Answer: B

Type: Concept

Difficulty: Medium LO: 13.5

AGL. 114. Use the following statements to answer this question:

AGM. I. The fact that EDC provides an insurance against political risk lowers the cost of capital for the firm.

AGN. II. Foreign Direct Investments are priced the same way as domestic investment.

AGO. A. I and II are correct

AGP. B. I and II are incorrect

AGQ. C. I is correct and II is incorrect

AGR. D. I is incorrect and II is correct

AGS. Answer: C Type: Concept Difficulty: Medium LO: 13.5

AGT.

AGU. 115. Alberta Tar Sand Inc., a Canadian company, has an opportunity to invest in Peru. The project requires an immediate cash outlay of \$3 million and is expected to provide after-tax cash flows of \$800,000 in year 1, \$1,000,000 in year 2, \$1,200,000 in year 3, and \$1,600,000 in year 4. The appropriate discount rate for a similar project in Canada is 12 percent. The risks of implementing such a project in Peru will require a risk premium of 4 percent. What will be the impact on the shareholder value of Syntax if the firm undertakes this project in Peru?

AGV. A. Increase by \$85,273

AGW. B. Increase by \$382,445

AGX. C. Increase by \$3,085,273

AGY. D. Increase by \$3,382,445

AGZ. Answer: A Type: Calculation Difficulty: Medium LO: 13.5

AHA. How options were determined:

AHB. A. Project's required return = 12% + 4% = 16%

$$NPV = -\$3,000,000 + \frac{\$800,000}{1.16} + \frac{\$1,000,000}{1.16^2} + \frac{\$1,200,000}{1.16^3} + \frac{\$1,600,000}{1.16^4} = \$85,273$$

AHD.

AHE. B. NPV computed with discount rate without the risk premium

AHF. C. PV(future CFs) in A)

AHG. D. PV(future CFs) in B)

AHH.

AHI. 116. North Pole Inc., a Canadian company, has an opportunity to invest in India.

The project requires an immediate cash outlay of \$2 million and is expected to provide after-tax cash flows of \$600,000 in year 1, \$800,000 in year 2, \$1,000,000 in year 3, and \$1,200,000 in year 4. The beta for a similar project in Canada is 1.2. The risk free rate is 5 percent and the market risk premium is 7.5 percent. The risks of implementing such project in India will require a risk premium of 4.5 percent. What will be the impact on the shareholder value of North Pole Inc. if the firm undertakes this project in India?

AHJ. A. Increase by \$285,564

AHK. B. Increase by \$527,358

AHL. C. Increase by \$616,918

AHM. D. Increase by \$917,295

AHN. Answer: A Type: Calculation Difficulty: Medium LO: 13.5

AHO. How options were determined:

AHP. A. Project's required return = 5% + 1.2*7.5% + 4.5% = 18.5%

$$NPV = -\$2,000,000 + \frac{\$600,000}{1.185} + \frac{\$800,000}{1.185^2} + \frac{\$1,000,000}{1.185^3} + \frac{\$1,200,000}{1.185^4} = \$285,564$$

- AHS. B. Required return = $5\% + 1.2 \times 7.5\% = 14\%$. NPV = \$527,358
 AHT. C. Required return = $5\% + 1.2(7.5\% - 5\%) + 4.5\% = 12.5\%$; NPV = \$616,918
 AHU. D. Required return = $5\% + 1.2(7.5\% - 5\%) = 8\%$; NPV = \$917,295

AHV.

AHW. **Practice Problems**

AHX. 117. Explain why capital expenditures can be viewed as the most important decisions a firm can make.

AHY. Type: Concept Difficulty: Medium LO: 13.1

AHZ. Suggested answer:

AIA. A firm's capital expenditures usually involve large amounts of money and the decisions are frequently irrevocable. The importance of capital expenditure decisions lies in their ability to affect the risk of the firm. In some cases, the very survival of the firm depends on the success of a new product produced from prior capital expenditure decisions. A firm that does not invest effectively will find itself at a competitive disadvantage, which in the extreme will affect its long-term survival. In the short run, poor investment decisions will make a firm less attractive than those that have better prepared themselves for the future. This will manifest itself in the market price of its debt and equity securities, which will decline, and will hence increase its cost of capital.

AIB.

AIC. 118. Michael Porter argues that firms can create competitive advantages for themselves by adopting one of the two strategies. Explain what they are.

AID. Type: Concept Difficulty: Medium LO: 13.1

AIE. Suggested answer:

- a. Cost leadership: strive to be a low-cost producer. This strategy is viable for firms that are able to take advantage of economies of scale, proprietary technology, or privileged or superior access to raw materials. Obviously, investment outlays should be made in accordance with a firm's potential advantage. For example, if economies of scale or technological advantages are possible, firms should invest in a manner that will enable them to exploit these opportunities.
- b. Differentiation: offer "differentiated" products. Firms can provide products that are differentiated from others in several ways. The most obvious is to have a product that is itself unique by virtue of its physical or technological characteristics. However, firms can also differentiate their products by providing customers with unique delivery alternatives, or by establishing a marketing approach that distinguishes their products from those of their potential competitors.

AIF.

AIG. 119. Why is the NPV rule a better choice than the IRR rule to rank projects?

AIH. Type: Concept Difficulty: Medium LO: 13.2

AII. Suggested answer:

AIJ. The NPV assumes that all cash flows are reinvested at the cost of capital. The IRR assumes instead that all cash flows are reinvested at the IRR. The fact that most projects will have low or zero NPV in a competitive market and that the discount rate reflects the opportunity cost or the all-in required return of the firm's investors, it is clear that the NPV assumption is more realistic. To put it another way, if an executive estimates an IRR of, say, 30 percent because he or she finds a wonderful project, the executive is then

implicitly assuming that the cash flows generated by this wonderful project can be reinvested in another similarly wonderful project. This means that the executive is assuming that he or she has many wonderful projects, which normally is not a very realistic assumption.

AIK.

AIL. 120. Under what circumstances will the IRR method of project evaluation conflict with the NPV method?

AIM. Type: Concept Difficulty: Medium LO: 13.2

AIN. Suggested answer:

AIO. IRR can favour small projects with high rates of return but low NPVs.

AIP. IRR can give misleading results when comparing mutually exclusive projects.

AIQ. IRR cannot handle complex cash flow streams (i.e., more than one change in cash flow sign), as it gives multiple rates of return.

AIR.

AIS. 121. Under what conditions will the NPV be a better capital budgeting criterion than the PI?

AIT. Type: Concept Difficulty: Medium LO: 13.2

AIU. Suggested answer:

AIV. When comparing mutually exclusive projects that differ in size, the NPV and the PI will give different ranking to the projects. The NPV is an absolute measure of wealth, whereas the PI is a relative measure. Hence, the NPV is a better capital budgeting criterion than the PI.

AIW.

AIX. 122. What are project interdependencies?

AIY. Type: Definition Difficulty: Medium LO: 13.3

AIZ. Suggest answer:

AJA. Interdependencies exist when the cash flows generated by one project depend on other investments that the firm may consider. The interdependence may be either complementary or negative. Extreme examples are projects that are mutually exclusive and projects that are contingent upon each other.

AJB.

AJC. 123. Differentiate between projects that are mutually exclusive and projects that are contingent upon each other.

AJD. Type: Definition Difficulty: Medium LO: 13.3

AJE. Suggested answer:

AJF. Mutually exclusive projects are projects for which the acceptance of one precludes the acceptance of one or more of the alternative projects.

AJG. Contingent projects are projects for which the acceptance of one requires the acceptance of another, either beforehand or simultaneously.

AJH.

AJI. 124. When a business faces capital rationing, what discount rate is used and why?

AJJ. Type: Concept Difficulty: Medium LO: 13.4

AJK. Suggested answer:

AJL. When a business faces capital rationing, the cost of capital is no longer the appropriate opportunity cost. The discount rate that should be applied is the effective yield of the most attractive investment foregone, a higher rate than assumed by the cost of

capital, because any accepted project should yield at least as much as the most desirable opportunity that had to be rejected or postponed because of lack of financing.

AJM.

AJN. 125. In a capital rationing situation, should firms always accept the project with the highest NPV?

AJO. Type: Concept Difficulty: Medium LO: 13.4

AJP. Suggested answer:

AJQ. Firms facing capital budget constraints may be forced to turn down attractive projects. Given limited funds, it becomes important to accept the combination of projects that are most feasible and yielding the highest NPV. Project interdependencies must be accounted for. It is possible that out of all the projects under consideration, the projects that do not have the highest NPV could be combined and together they exceed the NPV of the most attractive project.

AJR.

AJS. 126. Name the five practical difficulties that firms may encounter in applying the NPV evaluation process to foreign direct investments.

AJT. Type: Concept Difficulty: Medium LO: 13.5

AJU. Suggested answer:

AJV. Five practical difficulties are how to:

AJW. a) account for the political risk of expropriation or insurrection or the imposition of foreign exchange controls so firms cannot get their investments back

AJX. b) account for other potential legal and regulatory issues where local competitors may have privileged access to cronies in the government

AJY. c) adjust for foreign exchange risk because cash flows are denominated in a foreign currency

AJZ. d) adjust for the taxes paid in a foreign currency and the possibility that when they are paid back to the home country, they may be taxed again

AKA. e) finance a foreign project if the local markets are poorly developed

AKB.

AKC. 127. How do firms manage foreign exchange risk arising from their foreign direct investments?

AKD. Type: Concept Difficulty: Medium LO: 13.5

AKE. Suggested answer:

AKF. Firms routinely use forwards to sell future foreign cash flows forward into domestic currency and may also issue foreign currency debt to hedge their investments.

AKG.

AKH. 128. What are the sources of risk in foreign direct investments?

AKI. Type: Concept Difficulty: Medium LO: 13.5

AKJ. Suggested answer:

AKK. The risk involved with the foreign investment lies in the political risk and economic conditions of the host country. By investing in another country, the firm is exposed to the volatility of cash flows from the host country. The risk could be political like expropriation, or economic like a recession.

AKL.

AKM. 129. What is the project's NPV if it requires an initial cash outlay of \$50,000 and pays \$15,000 every other year forever, with the first payment occurring one year from now? Assume the discount rate is 12 percent and the tax rate is zero.

AKN. Type: Calculation Difficulty: Medium LO: 13.5

AKO. Suggested answer:

AKP. Effective discount rate for a 1-year period = 12%

$$\begin{aligned}PV_{-1}(CF) &= \frac{\$15,000}{0.2544} = \$58,962.26 \\PV_0(CF) &= \$58,962.26 * (1.12) = \$66,037.74 \\NPV &= -\$50,000 + \$66,037.74 = \$16,037.74\end{aligned}$$

AKR.

AKS.

AKT. 130. Suppose the Canadian Space Flight Group has two mutually exclusive projects: space flight using an Airbus and space flight using a Bombardier aircraft. Project Airbus requires an initial cash outlay of \$325,000 and is expected to provide after-tax cash flows of \$60,000 in year 1, \$80,000 in year 2, \$150,000 in year 3, and \$180,000 in year 4. Project Bombardier requires an initial cash outlay of \$250,000 and is expected to provide after-tax cash flows of \$70,000 in year 1, \$100,000 in year 2, \$120,000 in year 3, and \$70,000 in year 4. The appropriate discount rate is 12 percent.

AKU. A. Find the IRRs of both projects.

AKV. B. Find the crossover rate of the two projects.

AKW. C. Which project should be accepted using the information in (B)? Why?

AKX. Type: Calculation Difficulty: Medium LO: 13.2

AKY. Suggested answers:

$$\begin{aligned}NPV_A = 0 &= -\$325,000 + \frac{\$60,000}{(1+IRR_A)} + \frac{\$80,000}{(1+IRR_A)^2} + \frac{\$150,000}{(1+IRR_A)^3} + \frac{\$180,000}{(1+IRR_A)^4} \\IRR_A &= 13.63\%\end{aligned}$$

ALA.

$$\begin{aligned}NPV_B = 0 &= -\$250,000 + \frac{\$70,000}{(1+IRR_B)} + \frac{\$100,000}{(1+IRR_B)^2} + \frac{\$120,000}{(1+IRR_B)^3} + \frac{\$70,000}{(1+IRR_B)^4} \\IRR_B &= 16.04\%\end{aligned}$$

ALC.

ALD.

ALE. B. The crossover rate of projects Airbus and Bombardier, $CR = IRR$ of project (Airbus-Bombardier)

ALF. Cash flows of Project (Airbus - Bombardier): $-\$75,000, -\$10,000, -\$20,000,$

$$\begin{aligned}NPV_{A-B} &= -\$75,000 - \frac{\$10,000}{(1+CR)} - \frac{\$20,000}{(1+CR)^2} + \frac{\$30,000}{(1+CR)^3} + \frac{\$110,000}{(1+CR)^4} \\CR &= 9.03\%\end{aligned}$$

ALG.

ALH.

ALI. C. Given $k=12\% >$ the crossover rate $=9.03\%$, project Bombardier should be accepted. Beyond the crossover point, project Bombardier is preferred to project Airbus because project Airbus' far-off cash flows are worth less. Thus, project Bombardier has a higher NPV than project Bombardier.

ALJ.

ALK. 131. The Newfoundland Vintners Co-operative is considering two separate, mutually exclusive projects: Absinth and Brandy. Project Absinth requires a \$20,000 cash outlay today and is expected to generate after-tax cash flows of \$11,000 in year 1, \$8,500 in year 2, and \$7,500 in year 3. Project Brandy requires a \$30,000 cash outlay today and is expected to generate after-tax cash flows of \$7,000 in year 1, \$9,000 in year 2, \$11,000 in year 3 and \$16,000 in year 4. Neither project can be repeated at the end of its life. The appropriate discount rate for both projects is 10 percent.

ALL. A. Calculate the NPV's both projects.

ALM. B. Calculate the IRR's of both projects.

ALN. C. Calculate the payback periods of both projects.

ALO. D. Calculate the discounted payback periods of both projects.

ALP. E. Calculate the profitability index of both projects.

ALQ. F. Which project should the firm choose using the information in (A) – (E)? Why?

ALR. Type: Calculation Difficulty: Medium LO: 13.2

ALS. Suggested answer:

$$NPV_A = -\$20,000 + \frac{\$11,000}{1.10} + \frac{\$8,500}{1.10^2} + \frac{\$7,500}{1.10^3} = \$2,659.65$$

$$NPV_B = -\$30,000 + \frac{\$7,000}{1.10} + \frac{\$9,000}{1.10^2} + \frac{\$11,000}{1.10^3} + \frac{\$16,000}{1.10^4} = \$2,994.33$$

ALV.

$$NPV_A = 0 = -\$20,000 + \frac{\$11,000}{(1+IRR_A)} + \frac{\$8,500}{(1+IRR_A)^2} + \frac{\$7,500}{(1+IRR_A)^3}$$

$$IRR_A = 17.97\%$$

$$NPV_B = 0 = -\$30,000 + \frac{\$7,000}{(1+IRR)} + \frac{\$9,000}{(1+IRR)^2} + \frac{\$11,000}{(1+IRR)^3} + \frac{\$16,000}{(1+IRR)^4}$$

$$IRR = 13.95\%$$

ALY.

ALZ.

AMA. C.

A M B : Y	AM C. C F	AMD. PV(CF)	AME. A ccumulat ed CF	AMF. PV(Ac cumulated CF)

AMG. Project Absinth:				
A M H . 1	AM I. \$ 1 1 , 0 0 0	AMJ. \$10,00 0	AMK. \$ 11,000	AML. \$10,00 0.00
A M M . 2	AM N. \$ 8 , 5 0 0	AMO. \$7,024. 79	AMP. \$ 19,500	AMQ. \$17,02 4.79
A M R . 3	AM S. \$ 7 , 5 0 0	AMT. \$5,634. 86	AMU. \$ 27,000	AMV. \$22,65 9.65
AMW. Project Brandy:				
A M X . 1	AM Y. \$ 7 , 0 0 0	AMZ. \$6,363. 64	ANA. \$ 7,000	ANB. \$6,363 .64
A N C . 2	AN D. \$ 9 , 0 0 0	ANE. \$7,438. 02	ANF. \$ 16,000	ANG. \$13,80 1.65
A N H . 3	AN I. \$ 1 1 , 0 0	ANJ. \$8,264. 46	ANK. \$ 27,000	ANL. \$22,06 6.12

	0			
A N M . 4	AN N. \$ 1 6 , 0 0 0	ANO. \$10,92 8.2 2	ANP. \$ 43,000	ANQ. \$32,99 4.33
A N R .	AN S.	ANT.	ANU.	ANV.

$$= 2 + \frac{\$20,000 - \$19,500}{\$7,500} = 2.07$$

$$= 3 + \frac{\$30,000 - \$27,000}{\$16,000} = 3.19$$

$$= 2 + \frac{\$20,000 - \$17,024.79}{\$5,634.86} = 2.53$$

$$= 3 + \frac{\$30,000 - \$22,066.12}{\$10,928.22} = 3.73$$

$$= \frac{\$22,659.65}{\$20,000} = 1.13$$

$$= \frac{\$32,994.33}{\$30,000} = 1.10$$

AOC. Project Brandy's PI

AOD. F. Both projects A and B are good investments because they provide a positive NPV. In general we would have to compare the two projects using either the common lives or equivalent net present value approach as the two projects have different lives – however, as the two projects cannot be repeated, we will just use the standard one-shot analysis.

AOE. Comparing the two projects, project Brandy should be chosen for its higher NPV value despite all other investment criteria favouring Project Absinth. Whenever there are conflicts among investment criteria, the NPV rule prevails because the final decision should be based on which project maximizes the shareholder value of the company.

AOF.

AOG. 132. The Spinning Politician Company is considering three separate, mutually exclusive projects: Adscams, Boondoggles, and Closures. Project Adscams requires an initial investment of \$12,000 and is expected to generate after-tax cash flows of \$6,000

per year for five years. Project Boondoggles requires an initial investment of \$18,000 and is expected to generate after-tax cash flows of \$10,000 per years for three years. Project Closures requires an initial investment of \$25,000 and is expected to generate \$11,000 per year for four years. All projects can be replicated. The Project Betas for Adscams, Boondoggles, and Closures are 1.2, 0.9, and 1.5, respectively. The risk free rate is 4.25 percent and the expected return on the market is 10.5 percent.

H) A. Find the required rates of return for the three projects.

AOH. B. Find the NPVs of the three projects.

AOI. C. Which project should the company undertake? Why?

AOJ. Type: Calculation Difficulty: Medium LO: 13.2

AOK. Suggested answers:

AOL. A. Project Adscams' required return = $4.25\% + 1.2 \times (10.5\% - 4.25\%) = 11.75\%$

AOM. Project Boondoggles' required return = $4.25\% + 0.9 \times (10.5\% - 4.25\%) = 9.875\%$

AON. Project Closures' required return = $4.25\% + 1.5 \times (10.5\% - 4.25\%) = 13.625\%$

AOO.

AOP. B. $NPV_A = -\$12,000 + \$6,000 \times PVA(11.75\%, 5) = \$9,763.28$

AOQ. $NPV_B = -\$18,000 + \$10,000 \times PVA(9.875\%, 3) = \$6,923.35$

$$EANPV_A = \frac{\$9,763.28}{PVA(11.75\%, 5)} = \$2,691.68$$

$$EANPV_B = \frac{\$6,923.35}{PVA(9.875\%, 3)} = \$2,777.86$$

$$EANPV_C = \frac{\$7,298.80}{PVA(13.625\%, 4)} = \$2,485.75$$

AOU.

AOV.

AOW. Accept Project Boondoggles because it provides the highest EANPV.

AOX.

AOY. 133. Suppose a company has the following information on six independent projects:

AOZ.

APA. Project	APB. CF time 0	APC. Annual CF	APD. k	APE. Project Life
APF. Alpha	APG. \$3 million	APH. \$1.0 million	API. 20%	APJ. 5 years
APK. Beta	APL. \$8 million	APM. \$3.0 million	APN. 15%	APO. 4 years
APP. Charlie	APQ. \$7 million	APR. \$2.8	APS. 10%	APT. 3 years

		millio n		
APU. Delta	APV. \$5 million	APW. \$1.6 millio n	APX. 8%	APY. 4 years
APZ. Echo	AQA. \$4 million	AQB. \$1.8 millio n	AQC. 14%	AQD. 3 years
AQE. Foxtrot	AQF. \$6 million	AQG. \$1.5 millio n	AQI. 5 years AQH. 7%	

AQJ.

AQK. A. Find the IRRs of the six projects.

AQL. B. Construct an investment opportunity schedule for the six projects.

AQM. C. Which projects should the company undertake if it has no capital constraint?
Why?

AQN. D. What is the impact on the company's shareholder value in (C)?

AQO. E. Which projects should the company undertake if it has a capital constraint of \$15 million? Why?

AQP. F. What is the loss to the company from the capital rationing constraint in (E)?

AQQ. Type: Calculation Difficulty: Difficult LO: 13.2, 13.3, 13.4

AQR. Suggested answers:

AQS. A. Project's IRR is the discount rate that sets the project's NPV to 0:

AQT. $-CF_0 + \text{Annual CF} \cdot \text{PVAF}(\text{IRR}, n) = 0$

AQU. Project Alpha's IRR = 19.86%; project Beta's IRR = 18.45%;

AQV. Project Charlie's IRR = 9.70%; project Delta's IRR = 10.66%;

AQW. Project Echo's IRR = 16.65%; and project Foxtrot's IRR = 7.93%

AQX.

AQY. B. The investment opportunity schedule for the six projects is: Project Alpha's IRR = 19.86%; project Beta's IRR = 18.45%; Project Echo's IRR = 16.65%;

AQZ. project Delta's IRR = 10.66%; Project Charlie's IRR = 9.70%;

ARA. and project Foxtrot's IRR = 7.93%

ARB.

ARC. C. In the absence of budget constraint, the company should undertake projects Beta, Delta, Echo, and Foxtrot, because these projects' IRRs are greater than their required returns. Hence, they will provide positive NPVs.

ARD.

ARE. D. The company's shareholder value increases by the total NPV value of projects Beta, Delta, Echo, and Foxtrot combined

ARF. = \$1,193,571.83

ARG. $\text{NPV}_B = -\$8,000,000 + \$3,000,000 \cdot \text{PVAF}(15\%, 4) = \$564,935.09$ ARH. $\text{NPV}_D = -\$5,000,000 + \$1,600,000 \cdot \text{PVAF}(8\%, 4) = \$299,402.94$ ARI. $\text{NPV}_E = -\$4,000,000 + \$1,800,000 \cdot \text{PVAF}(14\%, 3) = \$178,937.65$

ARJ. $NPV_F = -\$6,000,000 + \$1,500,000 * PVAF(7\%, 5) = \$150,296.15$

ARK.

ARL. E. In the presence of a budget constraint of \$15 million, the company should undertake projects Beta and Delta, which provide the highest total NPV value = \$564,935.09 + \$299,402.94 = \$864,338.03, among the other possible combinations.

ARM. F. The loss to the company is the total NPVs of the foregone projects Echo and Foxtrot

ARN. = \$178,937.65 + \$150,296.15 = \$329,233.80.

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ASB.

ASC.

Chapter 14 – Cash Flow Estimation and Capital Budgeting Decisions

Multiple Choice Questions

Section 14.1 General Guidelines

1. Which of the following is **NOT** appropriate for estimating the cash flows associated with capital expenditure decisions?

- A. Discount nominal cash flows with nominal discount rates, and real cash flows with real discount rates.
- B. Include associated interest and dividend payments.
- C. Use after-tax cash flows with an after-tax discount rate.
- D. Use the marginal or incremental cash flows arising from capital budgeting decisions.

Answer: B Type: Concept Difficulty: Easy LO: 14.1

2. Which of the following should **NOT** be considered in the capital budgeting decision?

- A. Working capital requirements.
- B. Initial cash outlay.
- C. Opportunity costs.
- D. Sunk costs.

Answer: D Type: Concept Difficulty: Easy LO: 14.1

3. Which of the following should be accounted for in the capital budgeting decision?

- A. Externalities.
- B. Intangible considerations that cannot be measured.
- C. Opportunity costs.
- D. Sunk costs.

Answer: C Type: Concept Difficulty: Medium LO: 14.1

4. Which of the following should be ignored in the capital budgeting decision?

- A. The effect of all project interdependencies.
- B. Social investments required by law.
- C. Inflation.
- D. Externalities.

Answer: D Type: Concept Difficulty: Easy LO: 14.1

5. Incremental cash flows are of primary interest in capital budgeting decisions because:

- A. they are more relevant than intangible costs and benefits.
- B. they are able to correct for a portion of the uncertainty due to the long time horizon.
- C. the change in the company's future cash flows is what is being estimated.
- D. They are the easiest cash flows to identify.

Answer: C Type: Concept Difficulty: Medium LO: 14.1

6. Which of the following is **NOT** an incremental cash flow?

- A. Research and development costs for the new product, which have already been undertaken.
- B. Reduction in sales of an existing product line as a result of the introduction of the new product line.
- C. Cannibalization

D. Proceeds from the sale of old equipment.

Answer: A

Type: Concept

Difficulty: Medium LO: 14.1

7. A firm is considering a project that has cash flows indexed to the consumer price index, what discount rate should be chosen?

A. Nominal discount rate

B. Yield to maturity

C. Change in consumer price index

D. A rate that uses the consumer price index in its measure

Answer: D

Type: Concept

Difficulty: Difficult LO: 14.1

8. Which of the following is **NOT** an example of cannibalization?

A. Kellogg's introduces a new type of cereal.

B. Ford rolls out a new model of car.

C. Molson brings out a new beer.

D. Canadian Tire allows Tim Horton's to operate a concession stand in their retail outlets.

Answer: D

Type: Concept

Difficulty: Easy

LO: 14.1

9. Use the following statements to answer this question:

I. When we are dealing with cannibalization of a project we should ignore the old product.

II. Increases in incremental cash flows can be gained from decreases in expenses.

A. I and II are correct

B. I and II are incorrect

C. I is correct and II is incorrect

D. I is incorrect and II is correct

Answer: D

Type: Concept

Difficulty: Medium

LO: 14.1

10. A Canadian oil company is considering whether or not to develop a site it has been exploring for the past six months. One of the arguments for developing the site is that considerable time and money have already been expended. This cost should not be included in the capital budgeting decision because it is:

A. an opportunity cost.

B. a sunk cost.

C. an incremental cost

D. a financing cost

Answer: B

Type: Concept

Difficulty: Medium

LO: 14.1

11. A company is considering taking over a firm that has a very good company image. The company image cannot be assessed in financial terms and has no direct link to the change in cash flows. How can we categorize the company's image?

A. Opportunity cost

B. Sunk Cost

C. Externality

D. Intangible

Answer: D

Type: Concept

Difficulty: Medium

LO: 14.1

12. A real estate company started the exploration of buying a piece of land for condos. The company bought the land and started breaking ground. The housing market crashed, and the amount spent may not be recovered completely. What do we call the costs involved with the development of the land?

- A. An opportunity cost.
- B. A sunk cost.
- C. An incremental cost
- D. A financing cost

Answer: B

Type: Concept

Difficulty: Medium LO: 14.1

13. A real estate company started the exploration of buying a piece of land for condos. The company bought the land and started breaking ground. The housing market crashed, and the amount spent may not be recovered completely. What do we call the costs involved with the purchase of the land?

- A. An opportunity cost.
- B. A sunk cost.
- C. An incremental cost
- D. A financing cost

Answer: A

Type: Concept

Difficulty: Medium LO: 14.1

14. A pharmaceutical company has discovered a new drug that treats gastrointestinal disorders. In the testing phase of this new drug, the company further discovers that the drug is effective against migraine headaches. The R&D costs for the drug were \$3 million. When evaluating the capital budgeting decision for the migraine remedy, what portion of the R&D costs for the drug should be attributed to the migraine budget?

- A. 0 percent of the R&D costs.
- B. 50 percent of the R&D costs.
- C. 100 percent of the R&D costs.
- D. It can't be determined until the drug is further tested. There may be more uses for this drug and further testing is required.

Answer: A

Type: Concept

Difficulty: Difficult LO: 14.1

15. A pharmaceutical company has discovered a new drug that treats gastrointestinal disorders. The R&D costs for the drug were \$3 million. In the testing phase of this new drug, the company further discovers that there is a possibility that the drug would be effective against migraine headaches if they invest another 10% in R&D. When evaluating the capital budgeting decision for the migraine remedy, what portion of the R&D costs for the drug should be attributed to the migraine budget?

- A. 0 percent of the R&D costs.
- B. \$ 300,000 of the R&D costs.
- C. \$ 1.65 million of the R&D costs.
- D. It can't be determined until the drug is further tested. There may be more uses for this drug and further testing is required.

Answer: B

Type: Concept

Difficulty: Difficult

LO: 14.1

16. Which of the following would NOT be included in a capital budgeting evaluation?

- A. Incremental cash flows
- B. External benefits
- C. Effects of price level changes
- D. Taxes

Answer: B Type: Concept Difficulty: Medium LO: 14.1

17. Which of the following would be considered relevant cash flows in a capital budgeting evaluation?

- I. Increased after-tax income.
 - II. Tax savings due to increased depreciation expense.
 - III. Increased expenditures on inventory for the new project.
 - IV. Benefits that accrue to the local community.
- A. I, II, and III.
 - B. I, II, and IV.
 - C. I, III, and IV.
 - D. I, II, III, and IV.

Answer: A Type: Concept Difficulty: Medium LO: 14.1

18. Which of the following is **NOT** relevant to the cash flow estimates that are associated with a project?

- A. The associated financing costs.
- B. The economic life of the project.
- C. The effect of inflation.
- D. The terminal cash flow.

Answer: A Type: Definition Difficulty: Medium LO: 14.1

Section 14.2 Estimating and Discounting Cash Flows

19. Use the following two statements to answer this question:

- I. The initial after-tax cash flow refers to the total cash outlay that is required to initiate an investment project and can be depreciated for tax purposes.
- II. The capital cost of an investment refers to all costs incurred to make an investment operational, which includes the additional working capital requirements.

- A. I and II are correct.
- B. I and II are incorrect.
- C. I is correct, II is incorrect.
- D. I is incorrect, II is correct.

Answer: B Type: Concept Difficulty: Medium LO: 14.2

20. Which of the following is correct with respect to working capital and capital budgeting?

- A. Working capital is ignored in the capital budget.
- B. Working capital has a different discount rate.
- C. Working capital is assumed to be recuperated at the end of the life of the project.
- D. Initial investment funds are different from the working capital of a project.

Answer: C Type: Concept Difficulty: Difficult LO: 14.2

21. If the asset is depreciated completely before the end of the life of the project, what happens to the salvage value?

- A. The salvage value is ignored in the capital budget.
- B. The salvage value is amortized further.
- C. The after tax salvage value is discounted at the date of the disposal of the asset.
- D. The asset's life is extended.

Answer: C Type: Concept Difficulty: Medium LO: 14.2

22. Which of the following is **NOT** a component of the initial after-tax cash flow?

- A. The change in the net working capital requirements.
- B. The initial capital cost of the asset.
- C. The original cost of a capital asset that was incurred several years ago.
- D. The opportunity costs associated with the project.

Answer: C Type: Concept Difficulty: Medium LO: 14.2

23. According to Canada Revenue Agency:

I. The purchase cost of a capital asset is to be capitalized and its value expensed as depreciation expense over future periods.

II. The modification costs of a capital asset have to be expensed immediately.

- A. I and II are correct.
- B. I and II are incorrect.
- C. I is correct, II is incorrect.
- D. I is incorrect, II is correct.

Answer: C Type: Concept Difficulty: Medium LO: 14.2

24. What is the difference between the initial cash flow and the purchase price of an asset?

- A. Set up costs only
- B. Capital costs
- C. Other capital costs and net working capital
- D. None of the above

Answer: C Type: Concept Difficulty: Easy LO: 14.2

25. Which of the following is **NOT** a component of the expected annual after-tax cash flows?

- A. The additional depreciation expense that results from the capital cost of the investment.
- B. The additional taxes paid that result from the capital budgeting decision.
- C. The incremental increase in after-tax operating income of the project.
- D. The incremental tax savings that result from the initial investment outlay.

Answer: A Type: Concept Difficulty: Medium LO: 14.2

26. The following equation $(SV-C_0)T(1+k)^t$ is:

- A. Present value of the salvage value.
- B. Present value of the terminal value of the asset.
- C. Present value of the taxes owed on the gain resulting from the sale of an asset.

D. The present value of the depreciation.

Answer: C

Type: Concept

Difficulty: Medium LO: 14.2

27. Because CCA is a non-cash expense, in estimating the annual after-tax cash flows, we have to deal with it using one of the following two approaches:

I. Deduct CCA from operating income, then deduct the associated taxes payable, and finally add the amount of the CCA tax savings back.

II. Multiply the CCA by the company's effective tax rate and add this amount to the after-tax operating income.

A. I and II are correct.

B. I and II are incorrect.

C. I is correct, II is incorrect.

D. I is incorrect, II is correct.

Answer: D

Type: Concept

Difficulty: Medium LO: 14.2

28. Why do we add the present value of CCA tax shield to the NPV?

A. Tax shield is a cost.

B. CCA Tax shield arises from amortizing the asset.

C. CCA Tax shield arises from expensing interest rates.

D. None of the above

Answer: B

Type: Concept

Difficulty: Medium LO: 14.2

29. Use the following two statements to answer this question:

I. The use of declining balance CCA means that the tax deductions last forever and the asset is never fully depreciated.

II. The half-year rule results in CCA expense which is lower in year 1 and highest in year 2.

A. I and II are correct.

B. I and II are incorrect.

C. I is correct, II is incorrect.

D. I is incorrect, II is correct.

Answer: A

Type: Concept

Difficulty: Easy

LO: 14.2

30. Which of the following is **NOT** a true statement?

A. A capital gain arises when the selling price of an asset is greater than the original capital cost.

B. A capital loss arises when the selling price of an asset is lower than the original purchase price.

C. CCA recapture occurs when the salvage value of an asset exceeds the UCC and selling the asset terminates the CCA asset class.

D. A terminal loss occurs when the salvage value of an asset is less than the ending UCC and selling the asset terminates the CCA asset class.

Answer: B

Type: Concept

Difficulty: Medium LO: 14.2

31. Which of the following is most likely to occur upon termination of a project?

A. Capital gains

B. CCA recapture

C. Terminal losses

D. Working capital recapture

Answer: D

Type: Concept

Difficulty: Difficult LO: 14.2

32. Montreal Sun Printing is looking at an opportunity of setting up a new production facility, which requires the purchase of a new printing press that costs \$1 million. The costs to install the machine are \$60,000. The new facility is to be built on a piece of land that the company bought for \$150,000 five years ago. The market value of the land is \$250,000. The R&D costs associated with the investment opportunity were \$50,000. In addition, the company will need to purchase \$40,000 additional inventory for the project use. What is the initial after-tax cash flow associated with the investment opportunity?

- A. \$1,250,000
- B. \$1,300,000
- C. \$1,350,000
- D. \$1,400,000

Answer: C

Type: Calculation

Difficulty: Easy

LO: 14.2

How options were determined:

- A. The purchase cost of land instead of the market value included in the computation
- B. A) and D) combined
- C. $CF_0 = \$1,000,000 + \$60,000 + \$40,000 + \$250,000 = \$1,350,000$
- D. R&D expenses included in the computation

33. Montreal Sun Printing is looking at an opportunity of setting up a new production facility, which requires the purchase of a new printing press that costs \$1 million. The costs to install the machine are \$60,000. The new facility is to be built on a piece of land that the company bought for \$150,000 five years ago. The market value of the land is \$250,000. The R&D costs associated with the investment opportunity were \$50,000. In addition, the company will need to purchase \$40,000 additional inventory for the project use. Which of these costs can be categorized as sunk cost?

- A. \$250,000
- B. \$60,000
- C. \$50,000
- D. None of them

Answer: C

Type: Calculation

Difficulty: Easy

LO: 14.2

34. La Montrealaire Transportation Company is considering a project, which requires the purchase of a fleet of trucks costing \$500,000. It will need to spend \$65,000 to modify the trucks before they can be put into operation. The associated opportunity costs are \$35,000. In addition, the company will need to spend \$10,000 on additional spare parts inventory. What is the capital cost associated with the investment opportunity?

- A. \$500,000
- B. \$565,000
- C. \$575,000
- D. \$610,000

Answer: B

Type: Calculation

Difficulty: Easy

LO: 14.2

How options were determined:

- A. Installation costs not included in the computation

- B. $C_0 = \$500,000 + \$65,000 = \$565,000$
- C. NWC included in the computation
- D. NWC and OC included in the computation

35. Given the following information on a project: initial capital cost = \$500,000; installation costs associated with the capital asset = \$25,000; R&D costs associated with the project = \$50,000; associated opportunity costs = \$80,000; increase in raw materials inventory = \$10,000. What is the initial cash outlay of the project?

- A. \$535,000
- B. \$590,000
- C. \$615,000
- D. \$665,000

Answer: C Type: Calculation Difficulty: Easy LO: 14.2

How options were determined:

- A. OC not included in the computation
- B. Installation costs not included in the computation
- C. $CF_0 = \$500,000 + \$25,000 + \$10,000 + \$80,000 = \$615,000$
- D. R&D costs included in the computation

36. Given the following information on a project: initial capital cost = \$500,000; installation costs associated with the capital asset = \$25,000; R&D costs associated with the project = \$50,000; associated opportunity costs = \$80,000; increase in raw materials inventory = \$10,000. Which of these amounts is included with working capital?

- A. \$ 500,000
- B. \$ 80,000
- C. \$ 10,000
- D. \$ 25,000

Answer: C Type: Calculation Difficulty: Easy LO: 14.2

37. La Poutine Cheese Products Inc. is considering a project which requires an initial cash outlay of \$290,000 comprised of \$235,000 for the purchase of new equipment, \$13,000 for the installation costs, and \$42,000 for additional inventory. In addition, the R&D associated with the project were \$5,000 and its opportunity costs are \$28,000. What is the capital cost associated with the investment opportunity?

- A. \$235,000
- B. \$248,000
- C. \$290,000
- A) **D. \$318,000**

Answer: B Type: Calculation Difficulty: Easy LO: 14.2

How options were determined:

- A. Installation costs not included in the computation
- B. $C_0 = \$235,000 + \$13,000 = \$248,000$
- C. NWC included in the computation
- D. NWC and OC included in the computation

38. Which one of the following represents the change in net working capital?

- A. The level of inventory in the project.
- B. The difference between the account receivables at the end and beginning of the project.
- C. The difference between the account payables at the end and beginning of the project.
- D. The difference between current assets and current liabilities.

Answer: D

Type: Concept

Difficulty: Medium

LO: 14.2

39. Unique Style Inc. is considering a five-year expansion project that requires an initial investment of \$500,000 for the purchase of a new machine with a CCA rate of 30 percent. The projected sales revenue and costs are \$450,000 and \$180,000 per year, respectively. The project's fixed costs are \$48,000 per year. The appropriate discount rate is 8 percent. The firm's marginal tax rate is 40 percent. What is the after-tax cash flow in year three?

- A. \$162,600
- B. \$168,900
- C. \$191,400
- D. \$197,700

Answer: B

Type: Calculation

Difficulty: Medium

LO: 14.2

How options were determined:

- A. Half-year rule not applied in the CCA computation
- B. $CCA_3 = \$500,000 * (1 - 30\%/2) * (1 - 30\%) * 30\% = \$89,250$
- $CFAT_3 = (\$450,000 - \$180,000 - \$48,000) * (1 - 40\%) + \$89,250 * 40\% = \$168,900$
- C. A) and D) combined
- D. FC not included in the computation

40. The following information was reported last year:

	Beginning	Ending
Accounts receivable	\$65,250	\$75,338
Accounts payable	\$42,362	\$55,124
Inventory	\$51,225	\$63,037

What was the change in net working capital for the year?

- A. -\$9,138
- B. -\$34,662
- C. \$9,138
- D. \$34,662

Answer: A

Type: Calculation

Difficulty: Medium

LO: 14.2

How options were determined:

- A. $\text{Change in NWC} = (\$65,250 - \$75,338) + (\$55,124 - \$42,362) + (\$51,225 - \$63,037) = -\$9,138$
- B. Total Beginning minus Total Ending
- C. Outflows treated as inflows
- D. Total Ending minus Total Beginning

41. The following information was reported last year:

	Beginning	Ending
Accounts receivable	\$65,250	\$75,338

Accounts payable	\$42,362	\$55,124
Inventory	\$51,225	\$51,225

What was the change in net working capital for the year?

- A. \$2,674
- B. -\$22,850
- C. \$-2,674
- D. \$-\$22,850

Answer: A

Type: Calculation

Difficulty: Medium

LO: 14.2

How options were determined:

- A. Change in NWC = $$(65,250 - 75,338) + $(55,124 - 42,362) + $0 = $2,674$
- B. Total Beginning minus Total Ending
- C. Outflows treated as inflows
- D. Total Ending minus Total Beginning

42. Given the following information from last year's financial statements:

	Beginning	Ending
Inventory	\$80,233	\$71,169
Accounts Receivable	\$73,489	\$64,508
Accounts Payable	\$55,332	\$42,256

What was the net cash flow if the reported sales revenue and costs for the same period were \$582,366 and \$437,265, respectively?

- A. \$113,980
- B. \$140,132
- C. \$150,070
- D. \$176,222

Answer: C

Type: Calculation

Difficulty: Medium

LO: 14.2

How options were determined:

- A. Change in NWC = Total Ending – Total Beginning
- B. Change in NWC deducted from CFBT
- C. Change in NWC = $$(80,233 - 71,169) + $(73,489 - 64,508) + $(42,256 - 55,332) = $4,969$. Net CF = $$582,366 - $437,265 + $4,969 = $150,070$
- D. Change in NWC = Total Beginning – Total Ending

43. Champlain Transportation Inc. is considering a five-year project that requires an initial capital investment of \$1 million. The project is expected to generate operating revenue of \$500,000 per year, and the associated operating expenses are estimated at \$250,000 per year. The capital asset belongs to asset class 9, which has a CCA rate of 30 percent. The firm's marginal tax rate is 35 percent. What is the after-tax cash flow for year 1?

- A. \$215,000
- B. \$267,500
- C. \$302,500
- D. \$312,500

Answer: A

Type: Calculation

Difficulty: Medium

LO: 14.2

How options were determined:

- A. $CCATS_1 = \$1,000,000 \cdot (30\%/2) \cdot 35\% = \$52,500$
- $CFAT_1 = \$500,000 - 250,000 \cdot (1 - 35\%) + \$52,500 = \$215,000$
- B. Half-year rule not applied in the CCA computation
- C. CFBT treated as CFAT in the computation
- D. CCA_1 treated as $CCATS_1$ in the computation

44. Champlain Transportation Inc. is considering a six-year project that requires \$800,000 for the purchase of a capital asset with a CCA rate of 30 percent. The project is expected to generate sales revenue of \$600,000 per year. The project's variable and fixed costs are estimated at \$240,000 and \$50,000 per year, respectively. The firm's marginal tax rate is 35 percent and cost of capital is 12 percent. What is the present value of the after-tax operating cash flows?

- A. \$828,449
- B. \$962,069
- C. \$1,274,536
- D. \$1,480,107

Answer: A

Type: Calculation

Difficulty: Medium

LO: 14.2

How options were determined:

- A. $PV(CFAT) = \$600,000 - 240,000 - 50,000 \cdot (1 - 35\%) \cdot PVA(12\%, 6) = \$828,449$
- B. FC not included in the computation
- C. CFBT treated as CFAT in the computation
- D. B) and C) combined

45. Toronto Skates Corp. is considering a five-year project that requires an initial investment of \$250,000. The project is expected to generate operating incomes of \$60,000 in year 1, \$90,000 in year 2, \$150,000 in year 3, \$100,000 in year 4, and \$80,000 in year 5. The asset belongs to asset class 7, which has a CCA rate of 15 percent. The firm's marginal tax rate is 35 percent and cost of capital is 10 percent. What is the present value of the after-tax operating cash flows?

- A. \$205,272
- B. \$233,739
- B) C. \$315,804**
- D. \$359,598

Answer: B

Type: Calculation

Difficulty: Medium

LO: 14.2

How options were determined:

- A. CCA rate treated as k in the computation
- B. $CFAT = CFBT \cdot (1 - 35\%)$

$$63 \text{ } PV(CFATs) = \frac{\$39,000}{1.10} + \frac{\$58,500}{1.10^2} + \frac{\$97,500}{1.10^3} + \frac{\$65,000}{1.10^4} + \frac{\$52,000}{1.10^5} = \$233,738.63 \text{ } PV$$

C. A) and D) combined

D. CFBT treated as CFAT in the computation

46. BC Travel Services is considering a new ten-year project that will generate additional sales revenue of \$200,000 per year. The associated costs are \$120,000 per year. The project is somewhat riskier than the company's current operations, and hence requires a risk premium of 2

percent. The company's cost of capital is 12 percent and marginal tax rate is 40 percent. What is the present value of the after-tax operating cash flows?

- C) **A. \$250,374**
 B. \$271,211
 C. \$417,289
 D. \$452,018

Answer: A Type: Calculation Difficulty: Medium LO: 14.2

How options were determined:

- A. $PV(CFAT) = \$ (200,000 - 120,000) * (1 - 40\%) * PVA(14\%, 10) = \$250,373.55$
 B. CFAT discounted by the company's cost of capital
 C. CFBT treated as CFAT in the computation
 D. B) and C) combined

47. Monteregie Auto Services is considering an opportunity to invest \$550,000 in a capital asset that will generate additional after-tax operating income of \$200,000 per year. The asset has a six-year life, a CCA rate of 20 percent, and an expected salvage value of \$60,000. The project has a beta of 1.5. The company's cost of capital is 12 percent and marginal tax rate is 35 percent. The risk-free rate is 4.5 percent and the market risk premium is 6 percent. What is the present value of the after-tax operating cash flows?

- A. \$512,526
 B. \$534,483
 C. \$788,501
 D. \$822,281

Answer: C Type: Calculation Difficulty: Medium LO: 14.2

How options were determined:

- A. CFAT treated as CFBT in the computation
 B. A) and D) combined
 C. The project's discount rate $= 4.5\% + 1.5 * (6\%) = 13.5\%$
 $PV(CFAT) = \$200,000 * PVA(13.5\%, 6) = \$788,500.91$
 D. CFAT discounted by the company's cost of capital

48. Canadian Donuts is looking at a new investment opportunity, which will require the purchase of a capital asset of \$1 million and additional raw materials inventory of \$50,000. The project is expected to generate operating revenue of \$750,000 per year, and the associated operating expenses are estimated at \$350,000 per year. The project has a five-year economic life. This capital asset belongs to asset class 8, which has a CCA rate of 20 percent. What is the CCA expense for year 3?

- A. \$115,200
 B. \$128,000
 C. \$144,000
 D. \$180,000

Answer: C Type: Calculation Difficulty: Easy LO: 14.2

How options were determined:

- A. CCA_4
 B. Half-year rule not applied in the CCA computation
 C. $CCA_3 = \$1,000,000 * (1 - 20\%/2) * (1 - 20\%) * 20\% = \$144,000$

D. CCA₂

49. Maple Syrup Food is considering a six-year expansion project that requires an initial investment of \$350,000 for the purchase of a new capital asset with a CCA rate of 20 percent. The costs to install the asset are \$25,000. The projected annual sales revenue and costs are \$200,000 and \$90,000 per year, respectively. The appropriate discount rate is 10 percent. The firm's marginal tax rate is 40 percent. What is the fourth year CCA expense?

- A. \$35,840
- B. \$38,400
- C. \$40,320
- D. \$43,200

Answer: D

Type: Calculation Difficulty: Easy LO: 14.2

How options were determined:

- A. B) and C) combined
- B. Half-year rule not applied in the CCA computation
- C. Installation costs not included in the computation
- D. $CCA_4 = (\$350,000 + \$25,000) * (1 - 20\%/2) * (1 - 20\%)^2 * 20\% = \$43,200$

50. The Beer Brewing Company is interested in a new eight-year project. The project calls for an initial cash outlay of \$1,000,000: \$850,000 for new equipment, \$50,000 for installation costs, and \$100,000 for additional net working capital. The asset has a CCA rate of 30 percent and an expected salvage value of \$75,000. The project will generate additional operating profit of \$325,000 per year. What is the UCC at the end of year 3?

- D) A. **\$308,700**
- B. \$354,025
- C. \$374,850
- D. \$416,500

Answer: C

Type: Calculation Difficulty: Easy LO: 14.2

How options were determined:

- A. Half-year rule not applied in the CCA computation
- B. Installation costs not included in the computation
- C. $Ending\ UCC_3 = (\$850,000 + \$50,000) * (1 - 30\%/2) * (1 - 30\%)^2 = \$374,850$
- D. Initial cash outlay treated as C_0 in the computation

51. Hull Small Business is considering an expansion project that requires \$135,000 for the purchase of capital assets and \$35,000 for additional inventory. The project will generate after-tax operating income of \$50,000 per year. The project has a five-year economic life and a CCA rate of 20 percent. What is the ending UCC upon termination of the project?

- A. \$44,237
- B. \$49,766
- E) C. **\$55,706**
- D. \$62,669

Answer: B

Type: Calculation Difficulty: Easy LO: 14.2

How options were determined:

- A. Half-year rule not applied in the CCA computation
- B. $Ending\ UCC_5 = \$135,000 * (1 - 20\%/2) * (1 - 20\%)^4 = \$49,766.40$

- C. A) and D) combined
 D. NWC_0 included in the computation of C_0

52. Laurentide Resort Corporation is considering a seven-year project that requires an initial investment of \$525,000 and generates annual after-tax operating cash flow of \$225,000. The asset has a CCA rate of 30 percent and an expected salvage value of \$65,000. The firm's marginal tax rate is 40 percent. What is the CCA tax savings for year 5?

- A. \$15,126
 B. \$18,368
 C. \$37,816
 D. \$45,919

Answer: B Type: Calculation Difficulty: Medium LO: 14.2

How options were determined:

- A. Half-year rule not applied in the CCA computation
 B. $CCATS_5 = \$525,000 * (1 - 30\%/2) * (1 - 30\%)^3 * 30\% * 40\% = \$18,367.65$
 C. CCA_5 in A)
 D. CCA_5 in B)

53. The Canadian Telephone Services is considering investing \$120,000 in a project, which represents the purchase price of a capital asset of \$105,000 and the associated installation costs of \$15,000. The project will generate annual after-tax operating income of \$30,000 for the next five years. The asset has a CCA rate of 30 percent and is expected to sell for \$10,000 at the end of five years. The firm's cost of capital is 12 percent and marginal tax rate is 40 percent. Assume the asset class is terminated. What is the present value of the total CCA tax savings?

- A. \$29,365.67
 B. \$30,827.76
 C. \$33,135.69
 D. \$34,116.61

Answer: D Type: Calculation Difficulty: Difficult LO: 14.2

How options were determined:

- A. Installation costs not included in the computation
 B. Terminal loss not included in the computation
 C. Half-year rule not applied in the ending UCC computation
 D. $Ending\ UCC_5 = \$120,000 * (1 - 30\%/2) * (1 - 30\%)^4 = \$24,490.2$

$$PV(CCATS) = \frac{\$120,000 * .4 * .3}{(.30 + .12)} \times \frac{1.06}{1.12} - \frac{\$10,000 * .4 * .3}{(.30 + .12)} \times \frac{1}{1.12^5} - \frac{\$(10,000 - 24,490.2) * .4}{1.12^5}$$

$$= \$34,116.61$$

54. Suppose a project requires a capital investment of \$300,000. The project will last for six years, at which time the asset will be sold for \$90,000. The asset will be depreciated on a declining balance basis at a CCA rate of 20 percent. The firm's marginal tax rate is 40 percent. The firm's required rate of return is 8 percent. Assume the asset class remains open after the asset is sold. What is the present value of CCA tax savings for the project?

- A. \$63,472.64

- B. \$65,950.56
 C. \$66,335.32
 D. \$66,720.08

Answer: C

Type: Calculation Difficulty: Difficult LO: 14.2

How options were determined:

A. CCA recapture – calculated without applying the half-year rule to the ending UCC computation, included in the computation

$$PV(CCATS) = \frac{\$300,000 \times .4 \times .2}{(.2 + .08)} \times \frac{1.04}{1.08} - \frac{\$90,000 \times .4 \times .2}{(.2 + .08)} \times \frac{1}{1.08^6} = \$66,335.32$$

C.

D. CCA recapture treated as terminal loss in the computation

55. Ontario Courier Service is considering investing in a capital asset that costs \$64,000. The project also requires an investment in net working capital of \$8,000. The project will generate annual after-tax operating income of \$20,800 for the next four years. The asset has a CCA rate of 20 percent and is expected to sell for \$7,200 at the end of four years. The firm's cost of capital is 15 percent and marginal tax rate is 35 percent. Assume the asset class remains open after the asset is sold. What is the ending after-tax cash flow?

- A. \$7,398
 B. \$15,200
 C. \$21,855
 D. \$23,002

Answer: B

Type: Calculation Difficulty: Easy LO: 14.2

How options were determined:

- A. Terminal loss treated as CCA recapture in the computation
 B. ECF = \$7,200 + \$8,000 = \$15,200
 C. Terminal loss – calculated without applying half-year rule to the ending UCC computation, included in the computation
 D. Terminal loss included in the computation

56. Amazing Lace has an opportunity to invest in a ten-year project that requires an initial investment of \$2 million in a capital asset with a CCA rate of 20 percent. The initial net working capital requirement is \$200,000, which will remain unchanged throughout the life of the project. The capital asset is expected to sell for \$75,000 when the project terminates. Assume the asset class is closed upon termination of the project. The firm's cost of capital is 10.5 percent and marginal tax rate is 40 percent. What is the ending after-tax cash flow?

- A. \$208,363.24
 B. \$275,000.00
 C. \$330,899.35
 D. \$341,636.76

Answer: D

Type: Calculation Difficulty: Difficult LO: 14.2

How options were determined:

- A. Terminal loss treated as CCA recapture in the computation
 B. Terminal loss not included in the computation
 C. Half-year rule not applied in the ending UCC computation

D. Ending UCC = $\$2,000,000 \times (1 - 20\%/2) \times (1 - 20\%)^9 = \$241,591.91$; ECF = $\$75,000 + \$200,000 - (\$75,000 - 241,591.91) \times 40\% = \$341,636.76$

57. Queue de Castor Foods is considering the purchase of a new capital asset for \$35,000. The asset has an economic life of three years, a CCA rate of 20 percent, and expected salvage value of \$5,000. The project also requires an investment in net working capital of \$4,500. Assume the asset class remains open after the asset is sold. The firm's cost of capital is 14 percent and marginal tax rate is 40 percent. What is the present value of the terminal after-tax cash flow?

- A. \$2,319.20
- B. \$6,412.23
- C. \$9,900.48
- D. \$10,505.26

Answer: B

Type: Calculation

Difficulty: Easy

LO: 14.2

How options were determined:

$$PV(ECF) = \frac{\$4,500 + \$5,000}{1.14^3} = \$6,412.23$$

B.

C. Terminal loss – calculated without applying half-year rule in the ending UCC computation, included in the computation

D. Terminal loss included in the computation

58. Bugs Buster is considering investing in a new risky project that requires \$100,000 for the purchase of new equipment and \$20,000 for additional net working capital. The equipment has a five-year life and a CCA rate of 30 percent. The equipment is expected to sell for \$8,500 at the end of the project. Assume the asset class remains open after the asset is sold. The firm's cost of capital is 12 percent and marginal tax rate is 35 percent. The risk premium for the project is 3 percent. What is the present value of the terminal after-tax cash flow?

- A. \$14,169.54
- B. \$16,171.67
- C. \$16,241.76
- D. \$18,536.69

Answer: A

Type: Calculation

Difficulty: Easy

LO: 14.2

$$PV(ECF) = \frac{\$8,500 + \$20,000}{(1 + 12\% + 3\%)^5} = \$14,169.54$$

A.

B. ECF discounted by the firm's cost of capital

C. Terminal loss included in the computation

D. B) and C) combined

59. The Canadian Auto Shop Services has an opportunity to invest \$550,000 in a new project that will generate additional operating profit of \$200,000 per year. The asset has a six-year life, a CCA rate of 30 percent, and an expected salvage value of \$60,000. The project has a beta of 1.5. The company's cost of capital is 12 percent and marginal tax rate is 35 percent. The risk-free rate

is 4.5 percent and the market risk premium is 6 percent. Assume the asset class remains open after the asset is sold. What is the project's NPV?

- A. \$108,680
- B. \$137,415
- C. \$384,655
- D. \$425,214

Answer: A Type: Calculation Difficulty: Medium LO: 14.2

How options are determined:

- A. Determine the appropriate discount rate for the project using the project beta.
 $= 4.5\% + 1.5 \times 6\% = 13.5\%$

$$PV(CCATS) = \frac{\$550,000 \times .3 \times .35}{(.3 + .135)} \times \frac{1.0675}{1.135} - \frac{\$60,000 \times .3 \times .35}{(.3 + .135)} \times \frac{1}{1.135^6} = \$118,088.80$$

$$PV(ECF) = \frac{\$60,000}{1.135^6} = \$28,065.71$$

$$NPV = -\$550,000 + \$512,525.59 + \$118,088.80 + \$28,065.71 = \$108,680.11$$

- B. CFs discounted by the company's cost of capital
- C. CFBT treated as CFAT in the computation
- D. B) and C) combined

60. Toronto Skaters is considering the purchase of a new computer system for \$150,000. The asset has an economic life of four years, a CCA rate of 45 percent, and expected salvage value of \$10,000. The project also requires an investment in net working capital of \$6,500. The project is expected to generate after-tax operating income of \$80,000 per year. Assume the asset class remains open after the asset is sold. The firm's cost of capital is 18 percent and marginal tax rate is 40 percent. What is the NPV of the project?

- A. \$19,248.18
- B. \$21,175.39
- C. \$105,330.16
- D. \$107,257.37

Answer: C Type: Calculation Difficulty: Medium LO: 14.2

How options were determined:

- A. CFAT treated as CFBT in the computation
- B. A) and D) combined
- C. $CF_0 = \$150,000 + \$6,500 = \$156,500$;

$$PV(CCATS) = \frac{\$150,000 \times .4 \times .45}{(.45 + .18)} \times \frac{1.09}{1.18} - \frac{\$10,000 \times .4 \times .45}{(.45 + .18)} \times \frac{1}{1.18^4} = \$38,114.70$$

$$PV(ECF) = \frac{\$10,000 + \$6,500}{1.18^4} = \$8,510.52$$

$$NPV = -\$156,500 + \$215,204.94 + \$38,114.70 + \$8,510.52 = \$105,330.16$$

- D. Terminal loss included in the computation

61. Gourmet Kitchen is considering an expansion project that requires \$350,000 for the purchase of capital assets and \$15,000 for additional net working capital. The project is expected to generate operating revenue of \$500,000 per year, and the associated operating expenses are estimated at \$350,000 per year. The capital assets belong to asset class 9, which has a CCA rate of 30 percent. The assets are expected to sell for \$75,000 when the project terminates in five years. Assume the asset class is terminated upon termination of the project. The firm's cost of capital is 14 percent and marginal tax rate is 40 percent. What is the NPV of the project?

- A. \$68,948.61
 F) **B. \$69,690.32**

C. \$274,933.47
 D. \$275,675.18

Answer: A Type: Calculation Difficulty: Medium LO: 14.2

How options were determined:

A. $CF_0 = \$350,000 + \$15,000 = \$365,000$

$PV(CFAT) = (\$500,000 - \$350,000) * (1 - 40\%) * PVAF(14\%, 5) = \$308,977.29$

$$PV(CCATS) = \frac{\$350,000 * .4 * .3}{(.3 + .14)} \times \frac{1.07}{1.14} - \frac{\$75,000 * .4 * .3}{(.3 + .14)} \times \frac{1}{1.14^5} - \frac{(\$75,000 - \$71,429.75) * .4}{1.14^5}$$

$$= \$78,228.14$$

$$PV(ECF) = \frac{\$75,000 + \$15,000}{1.14^5} = \$46,743.18$$

$NPV = -\$365,000 + \$308,977.29 + \$78,228.14 + \$46,743.18 = \$68,948.61$

- B. CCA recapture not included in the computation
 C. CFBT treated as CFAT in the computation
 D. B) and C) combined

62. Lac Ontario Products Inc. is evaluating a ten-year project. The project requires an initial investment of \$1,500,000 and generates operating cash flow of \$500,000 per year. The project also requires an initial investment in net working capital of \$120,000. The asset belongs to asset class 8, which has a CCA rate of 20 percent. The asset is expected to sell for \$100,000 when the project terminates. The firm's cost of capital is 15 percent and marginal tax rate is 40 percent. Assume the asset class is terminated upon termination of the project. What is the NPV of the project?

- A. \$254,858.18
 B. \$262,886.15
 C. \$1,258,611.91
 D. \$1,266,639.87

Answer: B Type: Calculation Difficulty: Difficult LO: 14.2

How options were determined:

A. Terminal loss not included in the computation

B. $CF_0 = \$1,500,000 + \$120,000 = \$1,620,000$

$PV(CFAT) = \$500,000 * (1 - 40\%) * PVAF(15\%, 10) = \$1,505,630.59$

Ending $UCC_{10} = \$1,500,000 * (1 - 20\%/2) * (1 - 20\%)^9 = \$181,193.93$

$$PV(CCATS) = \frac{\$1,500,000 * .4 * .2}{(.2 + .15)} \times \frac{1.075}{1.15} - \frac{\$100,000 * .4 * .2}{(.2 + .15)} \times \frac{1}{1.15^{10}} - \frac{(\$100,000 - 181,193.93) * .4}{1.15^{10}} = \$322,874.92$$

$$PV(ECF) = \frac{\$100,000 + \$120,000}{1.15^{10}} = \$54,380.64$$

$$NPV = -\$1,620,000 + \$1,505,630.59 + \$322,874.92 + \$54,380.64 = \$262,886.15$$

C. A) and D) combined

D. CFBT treated as CFAT in the computation

63. The Mont Royal Lighting Corporation is considering investing \$100,000 in machinery that would generate operating cash flows of \$30,000 in year 1, \$60,000 in year 2, \$10,000 in year 3, \$50,000 in year 4, and \$40,000 in year 5. The equipment has a CCA rate of 30 percent and is expected to have no salvage value at the end of five years. Assume the asset class remains open after the asset is sold. The firm's marginal tax rate is 38 percent. If the appropriate discount rate is 10 percent, what is the project's NPV?

A. \$16,087.86

B. \$20,903.24

C. \$70,564.72

D. \$75,380.11

Answer: A

Type: Calculation

Difficulty: Medium LO: 14.2

How options were determined:

A. $CF_0 = \$100,000$

$$CFAT = CFBT * (1 - 38\%)$$

$$PV(CFATs) = \frac{\$18,600}{1.10} + \frac{\$37,200}{1.10^2} + \frac{\$6,200}{1.10^3} + \frac{\$31,000}{1.10^4} + \frac{\$24,800}{1.10^5} = \$88,883.31$$

$$PV(CCATS) = \frac{\$100,000 * .38 * .3}{(.3 + .1)} \times \frac{1.05}{1.10} = \$27,204.55$$

$$NPV = -\$100,000 + \$88,883.31 + \$27,204.55 = \$16,087.86$$

B. Terminal loss included in the computation

C. CFBT treated as CFAT in the computation

D. B) and C) combined

64. The Maritimes Toy Corporation is considering investing in a piece of new equipment worth \$50,000. The equipment will increase operating revenue by \$10,000 per year for ten years. The equipment is expected to have no salvage value at the end of ten years, and capital cost allowance is claimed at 20 percent on a declining balance. The corporate tax rate is 38 percent, and Doodle and Dandy's opportunity cost of capital is 9 percent. Assume the asset class remains open after the asset is sold. The project's NPV is closest to:

A. \$2,351.96

B. \$3,321.44

C. \$26,739.06

D. \$27,708.54

Answer: A

Type: Calculation

Difficulty: Easy

LO: 14.2

How options were determined:

$$PV(CCATS) = \frac{\$50,000 * .38 * .2}{(.2 + .09)} \times \frac{1.045}{1.09} = \$12,562.48$$

$$NPV = -\$50,000 + \$39,789.48 + \$12,562.48 = \$2,351.96$$

B. Terminal loss included in the computation

C. CFBT treated as CFAT in the computation

D. B) and C) combined

Section 14.3 Sensitivity to Inputs

65. Use the following two statements to answer this question:

I. Sensitivity analysis examines how an investment's NPV changes as we change the values of more than one input variable at a time.

II. Scenario analysis examines how an investment's NPV changes as we change the value of one input variable at a time.

A. I and II are correct.

B. I and II are incorrect.

C. I is correct, II is incorrect.

D. I is incorrect, II is correct.

Answer: B

Type: Concept Difficulty: Medium LO: 14.3

66. Which of the following is **FALSE** about scenario analysis?

A. It can provide important information because estimates will rarely be completely accurate and can often be very wrong.

B. It is often conducted in the form of a "what if" analysis.

C. It allows firms to determine which of their estimates is the most critical in the final decision.

D. It allows firms to account for interactions among the variables and for the fact that many variables can be related to external variables.

Answer: C

Type: Concept

Difficulty: Medium LO: 14.3

67. Which of the following is the purpose of providing a sensitivity analysis?

A. To determine which variable is most critical to the success or failure of a project.

B. To develop a probability distribution for a project.

C. To evaluate the worst-case scenarios.

D. To examine all possible outcomes of a project.

Answer: A

Type: Concept

Difficulty: Easy

LO: 14.3

68. In which of the following do we change one variable while holding the other variables constant to examine the impact on the NPV of a project?

A. NPV break-even analysis

B. Real option valuation

C. Scenario analysis

D. Sensitivity analysis

Answer: D

Type: Concept

Difficulty: Easy

LO: 14.3

69. Use the following statements to answer this question:

I. The breakeven NPV is the same as finding the IRR of the project

II. By assessing the breakeven NPV managers estimate the breakeven level of operating cash flows required for the project.

A. I and II are correct.

B. I and II are incorrect.

C. I is correct, II is incorrect.

D. I is incorrect, II is correct.

Answer: A

Type: Concept

Difficulty: Medium LO: 14.3

70. A manager is considering the following: taking a project this fiscal year or waiting for few years before committing. What method should she use to take this decision?

A. Breakeven analysis

B. Scenario analysis

C. Real option analysis

D. Sensitivity analysis

Answer: C

Type: Concept

Difficulty: Medium LO: 14.3

71. Which of the following is (are) useful in examining the relationship between the sales and profitability of an investment project?

I. Scenario analysis

II. Sensitivity analysis

III. Break-even analysis

A. II only.

B. I and II only.

C. I and III only.

D. II and III only.

Answer: D

Type: Concept

Difficulty: Medium LO: 14.3

72. An analysis of the degree to which a project's NPV depends on the underlying variables is called a(n):

A. Scenario analysis

B. Sensitivity analysis

C. Optimality analysis

D. Break-even analysis

Answer: B

Type: Concept

Difficulty: Medium LO: 14.3

73. Use the following two statements to answer this question:

I. Real option valuation takes into account that a firm responds to different circumstances and changes its operating characteristics.

II. Real option valuation places great weight on the flexibility involved in a firm's operations.

A. I and II are correct.

B. I and II are incorrect.

C. I is correct, II is incorrect.

D. I is incorrect, II is correct.

Answer: A

Type: Concept

Difficulty: Medium LO: 14.3

74. Use the following two statements to answer this question:

I. The break-even discount rate is the capital cost of the project

II. The NPV break-even operating cash flow is the level of annual operating cash flow required for a project to produce an NPV of zero.

A. I and II are correct.

B. I and II are incorrect.

C. I is correct, II is incorrect.

D. I is incorrect, II is correct.

Answer: D

Type: Concept

Difficulty: Medium LO: 14.3

75. The NPV break-even operating cash flow is:

A. The level of annual operating cash flow required for a project to produce an operating profit of zero.

B. The level of annual operating cash flow required for a project to produce an NPV of zero.

C. The level of annual operating cash flow required for a project to produce an NPV close to zero.

D. The level of annual operating cash flow required for a project to produce an accounting profit of zero.

Answer: B

Type: Concept

Difficulty: Easy

LO: 14.3

76. The Bits'n Bytes Computer Company has been requested by a large brokerage firm to submit a bid for a new computer system. The system would be installed in 20 branch offices per year for the next three years. Bits'n Bytes would need to purchase \$250,000 worth of specialized equipment. The CCA rate would be 25 percent. Bits'n Bytes will be able to sell the equipment in three years for \$125,000. Labour and material costs would be \$35,000 per site. The company would need to invest \$60,000 in net working capital. The relevant tax rate is 44 percent. Assume the asset class remains open after the asset is sold. If Bits'n Bytes requires a 16% return on investment, their minimum bid (price per system) should be:

A. \$22,950.93

B. \$38,350.93

C. \$40,983.80

D. \$68,483.80

Answer: C

Type: Calculation

Difficulty: Difficult

LO: 14.3

How options were determined:

A. After-tax revenue treated as pre-tax revenue to find price

B. Pre-tax costs treated as after-tax costs in the computation

C. $CF_0 = \$250,000 + \$60,000 = \$310,000$

$$PV(CCATS) = \frac{\$250,000 * .44 * .25}{(.25 + .16)} \times \frac{1.08}{1.16} - \frac{\$125,000 * .44 * .25}{(.25 + .16)} \times \frac{1}{1.16^3} = \$40,961.96$$

$$PV(ECF) = \frac{\$125,000 + \$60,000}{1.16^3} = \$118,521.67$$

PV(of minimum required revenues) = \$310,000 + \$880,388.70 - \$40,961.96 - \$118,521.67 =

$$\frac{\$1,030,905.07}{(1 - 44\%)} \times \frac{1}{PVAF_{16,3}} = \$819,676.07$$

Annual Pre-tax Revenue =

Minimum price per system = \$819,676.07 / 20 = \$40,983.80

D. A) and B) combined

77. Suppose a five-year project requires an initial capital investment of \$600,000 and an initial net working capital investment of \$30,000. The project is expected to provide operating revenue of \$400,000 per year. The associated operating costs are expected to be \$175,000 per year. The capital asset belongs to Class 7 and has a CCA rate of 15 percent. The asset is expected to sell for \$168,000 when the project terminates. Assume the asset class remains open after the project ends. The firm's marginal tax rate is 40 percent and cost of capital is 10 percent. What impact would it have on the project's NPV if the operating revenue falls by 5 percent?

A. NPV decreases by 21.85%

B. NPV decreases by 38.84%

C. NPV decreases by 46.19%

D. NPV decreases by 63.51%

Answer: B

Type: Calculation

Difficulty: Difficult LO: 14.3

How options were determined:

A. Computation done on 5% drop of operating income

$$PV(CCATS) = \frac{\$600,000 * .4 * .15}{(.10 + .15)} \times \frac{1.05}{1.10} - \frac{\$168,000 * .4 * .15}{(.10 + .15)} \times \frac{1}{1.10^5} = \$112,419$$

$$PV(ECF) = \frac{\$168,000 + \$30,000}{1.10^5} = \$122,942.42$$

PV(CFAT, Rev=\$400,000) = \$(400,000 - 175,000)*(1 - 40%)*PVAF(10%,5)
= \$511,756.21

PV(CFAT, Rev=\$380,000) = \$(380,000 - 175,000)*(1 - 40%)*PVAF(10%,5)
= \$466,266.77

NPV (Rev=\$400,000) = -\$630,000 + \$112,419 + \$122,942.42 + \$511,756.21
= \$117,117.63

NPV (Rev=\$380,000) = -\$630,000 + \$112,419 + \$122,942.42 + \$466,266.77

$$\frac{\$71,628.19}{\$117,117.63} - 1 = -38.84\%$$

% Change in NPV =

C. NWC recapture not included in the computation

D. NPV(Rev=\$380,000) used as denominator in the computation of % change

78. Suppose a seven-year project requires an initial capital investment of \$475,000 and an initial net working capital investment of \$25,000. The project is expected to provide operating revenue of \$350,000 per year. The associated operating costs are expected to be \$150,000 per year. The capital asset belongs to Class 8 and has a CCA rate of 20 percent. The asset is expected to sell for \$36,000 when the project ends. Assume the asset class remains open after the asset is sold. The firm's marginal tax rate is 40 percent and cost of capital is 8 percent. What impact would it have on the project's NPV if the operating costs increase by 5 percent?

- A. NPV decreases by 8.22%
- B. NPV decreases by 8.66%
- C. NPV decreases by 8.96%
- D. NPV decreases by 10.96%

Answer: A Type: Calculation Difficulty: Difficult LO: 14.3

How options were determined:

$$PV(CCATS) = \frac{\$475,000 * .4 * .2}{(.08 + .2)} \times \frac{1.04}{1.08} - \frac{\$36,000 * .4 * .2}{(.08 + .2)} \times \frac{1}{1.08^7} = \$124,686.22$$

$$PV(ECF) = \frac{\$36,000 + \$25,000}{1.08^7} = \$35,592.91$$

$$PV(CFAT, \text{Cost}=\$150,000) = (\$350,000 - \$150,000) * (1 - 40\%) * PVAF(8\%, 7) \\ = \$624,764.41$$

$$PV(CFAT, \text{Cost}=\$157,500) = (\$350,000 - \$157,500) * (1 - 40\%) * PVAF(8\%, 7) \\ = \$601,335.74$$

$$NPV (\text{Cost}=\$150,000) = -\$500,000 + \$124,686.22 + \$35,592.91 + \$624,764.41 \\ = \$285,043.54$$

$$NPV (\text{Cost}=\$157,500) = -\$500,000 + \$124,686.22 + \$35,592.91 + \$601,335.74$$

$$\frac{\$261,614.87}{\$285,043.54} - 1 = -8.22\%$$

% Change in NPV =

- B. NWC recapture not included in the computation
- C. NPV(Cost=\$157,500) used as denominator in the computation of % change
- D. Computation done on 5% drop of operating income

79. Suppose a six-year project requires an initial capital investment of \$425,000 and an initial net working capital investment of \$50,000. The project is expected to provide operating revenue of \$270,000 per year. The associated operating costs are expected to be \$130,000 per year. The capital asset belongs to Class 9 and has a CCA rate of 30 percent. The asset is expected to sell for \$40,000 when the project terminates. Assume the asset class remains open when the asset is sold. The firm's marginal tax rate is 40 percent and cost of capital is 8 percent. What impact would it have on the project's NPV if the cost of capital were 10 percent?

- A. NPV decreases by 23.14%
- B. NPV decreases by 38.04%
- C. NPV decreases by 48.20%

D. NPV decreases by 61.41%

Answer: B Type: Calculation Difficulty: Difficult LO: 14.3

How options were determined:

A. ECF treated as PV(ECF) in the computation

$$PV(CCATS, k = 8\%) = \frac{\$425,000 * .4 * .3}{(.08 + .3)} \times \frac{1.04}{1.08} - \frac{\$40,000 * .4 * .3}{(.08 + .3)} \times \frac{1}{1.08^6} = \$121,279.73$$

$$PV(CCATS, k = 10\%) = \frac{\$425,000 * .4 * .3}{(.1 + .3)} \times \frac{1.05}{1.10} - \frac{\$40,000 * .4 * .3}{(.1 + .3)} \times \frac{1}{1.10^6} = \$114,930.86$$

$$PV(ECF, k = 8\%) = \frac{\$40,000 + \$50,000}{1.08^6} = \$56,715.27$$

$$PV(ECF, k = 10\%) = \frac{\$40,000 + \$50,000}{1.10^6} = \$50,802.65$$

$$PV(CFAT, k=8\%) = \$ (270,000 - 130,000) * (1 - 40\%) * PVAF(8\%, 6) = \$388,321.89$$

$$PV(CFAT, k=10\%) = \$ (270,000 - 130,000) * (1 - 40\%) * PVAF(10\%, 6) = \$365,841.90$$

$$NPV (k=8\%) = -\$475,000 + \$121,279.73 + \$56,715.27 + \$388,321.89 = \$91,316.89$$

$$\frac{\$56,575.41}{\$91,316.89} - 1 = -38.04\%$$

% Change in NPV =

C. NWC recapture not included in the computation

D. NPV(k=10%) used as denominator in the computation of % change

80. A company is planning to invest in a project, which requires the purchase of capital assets of \$200,000 and additional net working capital of \$30,000. The assets have a five-year life, a CCA rate of 30 percent, and an expected salvage value of \$35,000. The annual costs for the project's operations are \$50,000. The company's effective tax rate is 40 percent and the cost of capital is 12 percent. Assume the asset class remains open after the assets are sold. What is the break-even pre-tax annual operating revenue?

A. \$70,144

B. \$90,144

C. \$116,907

D. \$150,240

Answer: C Type: Calculation Difficulty: Difficult LO: 14.3

How options were determined:

A. After-tax operating revenue in C)

B. A) and D) combined

$$PV(CCATS) = \frac{\$200,000 * .4 * .3}{(.12 + .3)} * \frac{1.06}{1.12} - \frac{\$35,000 * .4 * .3}{(.12 + .3)} * \frac{1}{1.12^5} = \$48,407.36$$

$$PV(ECF) = \frac{\$35,000 + \$30,000}{1.12^5} = \$36,882.75$$

$$PV(\text{CostAT}) = \$50,000 * (1 - 40%) * PVAF(12\%, 5) = \$108,143.29$$

$$\frac{252,853.18}{(1 - 40\%)} * \frac{1}{PVAF(12\%, 5)} = \$116,906.55$$

Annual Pre-tax Revenue =

D. Pre-tax costs treated as after-tax costs in the computation

81. A company is considering investing in a project, which requires the purchase of a new machine for \$250,000. The asset has a six-year life, a CCA rate of 30 percent, and an expected salvage value of \$30,000. The selling price of the product is \$40 per unit, while the variable cost is \$18 per unit and the fixed costs are \$50,000 per year. The company's effective tax rate is 40 percent and cost of capital is 10 percent. Assume the asset class remains open after the asset is sold. At what level of sales will the company break even?

A. 3,102 units

B. 4,011 units

C. 5,170 units

D. 6,685 units

Answer: C

Type: Calculation Difficulty: Difficult LO: 14.3

How options were determined:

A. After-tax revenue used in the computation of sales level

B. A) and D) combined

$$PV(CCATS) = \frac{\$250,000 * .4 * .3}{(.1 + .3)} * \frac{1.05}{1.10} - \frac{\$30,000 * .4 * .3}{(.1 + .3)} * \frac{1}{1.10^6} = \$66,510.64$$

$$PV(ECF) = \frac{\$30,000}{1.10^6} = \$16,934.22$$

$$PV(\text{FCAT}) = \$50,000 * (1 - 40%) * PVAF(10\%, 6) = \$130,657.82$$

$$\frac{\$297,212.96}{(1 - 40\%)} * \frac{1}{PVAF10, 6} = \$113,737.15$$

$$\frac{\$113,737.15}{\$ (40 - 18)} = 5,169.87 \text{ units} \approx 5,170 \text{ units}$$

Break-even sales level =

D. Pre-tax FC used in the computation of the BE revenue

82. Suppose an investment with an initial cost of \$10,000 is estimated to produce after-tax cash flows of \$3,000 per year for 8 years. How low can the annual after-tax cash flows be before the NPV of the investment equals zero? Assume that the appropriate discount rate is 8 percent.

A. \$1,250

B. \$1,260

C. \$1,740

D. \$2,262

Answer: C

Type: Calculation

Difficulty: Difficult LO: 14.3

How options were determined:

A. CF_0 / number of years

$$\frac{\$10,000}{PVAF(8\%, 8)} = \$1,740$$

C. BE annual CFAT =

D. $(CF_0 + \$3,000) / PVAF$

83. A software firm is considering developing a new financial planning software package. This new project is expected to sell 5,000 units per year and generate net operating cash flow of \$100 per unit for the next five years. The relevant discount rate is 15 percent and the initial investment is \$1.25 million. At what annual level of sales would it make sense to abandon the project if the project can be sold for \$150,000 after the first year? Ignore taxes.

A. less than 447 units

B. less than 525 units

C. more than 3,340 units

D. less than 3,729 units

Answer: B

Type: Calculation

Difficulty: Difficult LO: 14.3

How options were determined:

$$\frac{\$150,000}{PVAF(15\%, 4)} \times \frac{1}{\$100} = 525.4 \approx 525 \text{ units}$$

B. BE units =

C. BE units for CF_0 D. BE units for $CF_0 - PV(\text{Abandon value})$

Section 14.4 Replacement Decisions

84. Use the following two statements to answer this question:

I. Expansion projects are projects that would add something extra to the firm in terms of sales or cost savings. The incremental cash flows arising from such investment decisions are the new cash flows.

II. Replacement projects are projects that involve the replacement of an existing asset with a new one. The incremental cash flows arising from such investment decisions are the new operating expenses.

A. I and II are correct.

B. I and II are incorrect.

C. I is correct, II is incorrect.

D. I is incorrect, II is correct.

Answer: C

Type: Concept

Difficulty: Medium LO: 14.4

85. Use the following statements to answer this question:

I. Replacement projects are projects that involve the replacement of an existing project. The incremental cash flows are the difference between the costs and the revenues of the two projects.
 II. The discount rate of the two projects must be the same.

- A. I and II are correct.
 B. I and II are incorrect.
 C. I is correct, II is incorrect.
 D. I is incorrect, II is correct.

Answer: C

Type: Concept

Difficulty: Medium LO: 14.4

86. A firm is considering the purchase of a new computer system at \$180,000 to replace the existing system. The existing system has a market value of \$50,000 today and an expected salvage value of \$10,000 at the end of five years. The new system will have a life of five years and is expected to sell for \$50,000 at the end of five years. The new system will save the firm \$60,000 per year in operating expenses over the life of the system. Both computer systems belong to asset class 45, which has a CCA rate of 45 percent. The firm's marginal tax rate is 40 percent and its cost of capital is 10 percent. What is the NPV of the replacement decision?

- A. \$63,788.32
 B. \$69,997.54
 C. \$77,376.05
 D. \$83,585.26

Answer: A

Type: Calculation

Difficulty: Medium LO: 14.4

How options were determined:

$$PV(CCATS) = \frac{\$130,000 * .4 * .45}{(.1 + .45)} \times \frac{1.05}{1.10} - \frac{\$40,000 * .4 * .45}{(.1 + .45)} \times \frac{1}{1.10^5} = \$32,483.15$$

$$PV(ECF) = \frac{\$40,000}{1.10^5} = \$24,836.85$$

$$NPV = -\$130,000 + \$32,483.15 + \$136,468.32 + \$24,836.85 = \$63,788.32$$

- B. SV(old) not included in ECF
 C. Only $C_0(\text{new})$ and $SV(\text{new})$ included in the $PV(CCATS)$ computation
 D. B) and C) combined

87. A large printing company is considering purchasing a new printing press to replace the existing one that cost the company \$1 million five years ago. The new machine will cost the company \$1.8 million, has an economic life of ten years, and an expected salvage value of \$150,000. The old machine can be sold for \$200,000 today or could be sold for \$10,000 in ten years. Both machines have a CCA rate of 30 percent. The company projects that operating profit will increase by \$400,000 per year. The company's tax rate is 40 percent and the cost of capital is 12 percent. What is the NPV of the replacement decision?

- A. \$220,903.91
 B. \$224,123.64
 C. \$274,065.62
 D. \$277,285.35

Answer: A Type: Calculation Difficulty: Medium LO: 14.4
 How options were determined:

$$PV(CCATS) = \frac{\$1,600,000 * .4 * .3}{(.12 + .3)} \times \frac{1.06}{1.12} - \frac{\$140,000 * .4 * .3}{(.12 + .3)} \times \frac{1}{1.12^{10}} = \$419,774.13$$

$$PV(ECF) = \frac{\$140,000}{1.12^{10}} = \$45,076.25$$

NPV = $-\$1,600,000 + \$419,774.13 + \$1,356,053.53 + \$45,076.25 = \$220,903.91$

B. SV(old) not included in ECF

C. Only C_0 (new) and SV(new) included in the PV(CCATS) computation

D. B) and C) combined

88. A manufacturing company is considering purchasing a new machine to replace the existing one to improve production efficiency. The new machine will cost the company \$200,000 and is expected to sell for \$15,000 in ten years. The old machine has a market value of \$50,000 today and could be sold for \$5,000 in ten years. Both machines have a CCA rate of 30 percent. With the new machine, the company expects \$50,000 savings in operating expenses per year. The company's tax rate is 40 percent and the cost of capital is 15 percent. What is the present value of the incremental CCA tax savings generated by the replacement decision?

A. \$36,402.57

B. \$36,732.15

C. \$48,866.33

D. \$49,195.91

Answer: B Type: Calculation Difficulty: Medium LO: 14.4

How options were determined:

A. Only SV(new) included in the PV(CCATS) computation

$$PV(CCATS) = \frac{\$150,000 * .4 * .3}{(.15 + .3)} \times \frac{1.075}{1.15} - \frac{\$10,000 * .4 * .3}{(.15 + .3)} \times \frac{1}{1.15^{10}} = \$36,732.15$$

C. A) and D) combined

D. Only C_0 (new) included in the PV(CCATS) computation

Section 14.5 Inflation and Capital Budgeting Decisions

89. Which of the following is **NOT** a true statement?

A. Inflation always affects future levels of sales and expenses equally.

B. Inflation affects the firm's cost of capital.

C. Actual cash flows should be discounted with nominal discount rates.

D. Inflation-adjusted cash flows should be discounted with real discount rates.

Answer: A Type: Concept Difficulty: Medium LO: 14.5

90. Which of the following are ways that inflation impacts the capital budgeting process?

I. Inflation affects future expected cash flows.

II. Inflation is reflected in the firm's discount rate.

III. Inflation decreases the general price level.

A. III only.

B. I and II only.

C. I and III only.

D. II and III only.

Answer: B

Type: Concept

Difficulty: Easy

LO: 14.5

91. Use the following statements to answer this question:

I. Using real cash flows with a real discount rate yields the correct result.

II. Tax savings for CCA are normally reported in a given year dollars, so they are real values.

A. I and II are correct

B. I and II are incorrect

C. I is correct and II is incorrect

D. I is incorrect and II is correct

Answer: C

Type: Concept

Difficulty: Medium

LO: 14.5

92. A proposed ten-year project has the first year sales revenue and cost projected at \$300,000 and \$100,000, respectively. Sales revenue is expected to grow at 3 percent per year, while the costs will grow at 5 percent per year. The firm's marginal tax rate is 35 percent and required return is 9 percent. What is the present value of the after-tax operating cash flows generated by the project?

A. \$898,126

B. \$914,932

C. \$1,625,000

D. \$1,641,250

Answer: A

Type: Calculation

Difficulty: Medium

LO: 14.5

$$\frac{\$300,000 * (1 - 35\%)}{.09 - .03} - \frac{\$300,000 * (1 - 35\%) * (1.03)^{10}}{(.09 - .03) * (1.09)^{10}} = \$1,405,024.39$$

$$\frac{\$100,000 * (1 - 35\%)}{.09 - .05} - \frac{\$100,000 * (1 - 35\%) * (1.05)^{10}}{(.09 - .05) * (1.09)^{10}} = \$506,898.12$$

PV(CostAT) =

PV(CFAT) = \$1,405,024.39 - \$506,898.12 = \$898,126.27

B. Beginning values of revenue and costs are multiplied by (1 + corresponding growth rate)

C. Both revenue and costs computed as growing perpetuities rather than growing annuities

D. B) and C) combined

93. A project will cost \$50,000 to initiate and will generate real cash flows of \$40,000 in each of the next two years. The nominal discount rate has been estimated to be 10 percent per year. Expected inflation is 4 percent over the next two years. What is the NPV of the project?

A. \$19,421.49

B. \$21,573.55

C. \$23,573.55

D. \$25,496.63

Answer: C Type: Calculation Difficulty: Medium LO: 14.5

How options were determined:

A. Real CFs discounted by nominal rate

$$\frac{\$40,000 * (1.04)}{1.10} + \frac{\$40,000 * (1.04)^2}{1.10^2} - \$50,000 = \$23,573.55$$

C. NPV =

D. Used cost/1.04 instead of cost

94. A project will cost \$150,000 to initiate and will generate nominal cash flows of \$80,000 in each of the next three years. The real discount rate has been estimated to be 10 percent per year. Expected inflation is 3 percent over the next three years. What is the NPV of the project?

A. \$37,934.15

B. \$42,303.08

C. \$48,948.16

D. \$76,288.91

Answer: A

Type: Calculation Difficulty: Medium LO: 14.5

$$4.15 \frac{\$80,000}{(1.10)(1.03)} + \frac{\$80,000}{(1.10)^2(1.03)^2} + \frac{\$80,000}{(1.10)^3(1.03)^3} - \$150,000 = \$37,934.15 \frac{\$80,000}{(1.10)^3}$$

A. NPV =

B. NPV using cost = 150,000/1.03

C. Nominal CFs discounted by real rate

D. Discounted nominal cash flows by the inflation rate

95. Suppose a new machine costs \$100,000 and will provide nominal operating income of \$50,000 in each of the next four years. The machine belongs to asset class 9, which has a CCA rate of 30 percent. The machine is expected to be sold for \$25,000 at the end of four years. The real discount rate has been estimated to be 8 percent per year. Expected inflation is 2.5 percent over the next four years. The firm's marginal tax rate is 38%. Assume there are other assets in the asset class when the machine is sold. What is the NPV of the project?

A. \$35,435.83

B. \$44,427.84

C. \$94,761.86

D. \$107,358.25

Answer: A

Type: Calculation Difficulty: Medium LO: 14.5

How options were determined:

$$PV(CCATS) = \frac{\$100,000 * .38 * .3}{(.107 + .3)} \times \frac{1.0535}{1.107} - \frac{\$25,000 * .38 * .3}{(.107 + .3)} \times \frac{1}{1.107^4} = \$21,993.20$$

$$PV(ECF) = \frac{\$25,000}{1.107^4} = \$16,647.52$$

$$NPV = -\$100,000 + \$21,993.20 + \$96,795.10 + \$16,647.52 = \$35,435.82$$

- B. Nominal CFs discounted by real rate
 C. CFBT treated as CFAT in the computation
 D. B) and C) combined

96. A firm is considering a project that requires an initial cash outflow of \$1,000,000 for the purchase of a capital asset, which has an eight-year life and a CCA rate of 20 percent. The expected salvage value of the asset is \$75,000 at the end of eight years. The project will generate sales revenue of \$450,000 in the first year, which will grow at 5 percent per year in the subsequent years. Variable costs will be \$200,000 for the first year, which will also grow at 5 percent per year. The firm's marginal tax rate is 40 percent and required return is 12 percent. What is the project's NPV?

- A. \$123,498
 B. \$166,707
 C. \$1,402,183
 D. \$1,509,326

Answer: A

Type: Calculation Difficulty: Difficult LO: 14.5

$$PV(CCATS) = \frac{\$1,000,000 * .4 * .2}{(.12 + .2)} \times \frac{1.06}{1.12} - \frac{\$75,000 * .4 * .2}{(.12 + .2)} \times \frac{1}{1.12^8} = \$229,034.33$$

$$PV(ECF) = \frac{\$75,000}{1.12^8} = \$30,291.24$$

$$\frac{\$450,000 * (1 - 40\%)}{.12 - .05} - \frac{\$450,000 * (1 - 40\%) * (1.05)^8}{(.12 - .05) * (1.12)^8} = \$1,555,510.60$$

$$\frac{\$200,000 * (1 - 40\%)}{.12 - .05} - \frac{\$200,000 * (1 - 40\%) * (1.05)^8}{(.12 - .05) * (1.12)^8} = \$691,338.04$$

$$PV(\text{CostAT}) =$$

$$PV(\text{CFAT}) = \$1,555,510.60 - \$691,338.04 = \$864,172.56$$

$$NPV = -\$1,000,000 + \$229,034.33 + \$30,291.24 + \$864,172.56 = \$123,498.1$$

- B. Beginning values of revenue and costs are multiplied by (1 + growth rate)
 C. Both revenue and costs computed as growing perpetuities rather than growing annuities
 D. B) and C) combined

97. A firm is considering purchasing a new machine, which costs \$500,000 and has a six-year life, a CCA rate of 30 percent, and an expected salvage value of \$45,000. The project will generate sales revenue of \$200,000 in the first year, which will grow at 5 percent per year in the subsequent years. Variable costs will be \$80,000 for the first year, which will grow at 7 percent per year. The firm's marginal tax rate is 35 percent and required return is 10 percent. What is the project's NPV?

- A. \$12,264
 B. \$25,376
 C. \$497,546

D. \$519,351

Answer: A

Type: Calculation Difficulty: Difficult LO: 14.5

$$PV(CCATS) = \frac{\$500,000 * .35 * .3}{(.1 + .3)} \times \frac{1.05}{1.10} - \frac{\$45,000 * .35 * .3}{(.1 + .3)} \times \frac{1}{1.10^6} = \$118,616.24$$

$$PV(ECF) = \frac{\$45,000}{1.10^6} = \$25,401.33$$

$$\frac{\$200,000 * (1 - .35\%)}{.10 - .05} - \frac{\$200,000 * (1 - .35\%) * (1.05)^6}{(.10 - .05) * (1.10)^6} = \$633,232.46$$

$$\frac{\$80,000 * (1 - .35\%)}{.10 - .07} - \frac{\$80,000 * (1 - .35\%) * (1.07)^6}{(.10 - .07) * (1.10)^6} = \$264,986.52$$

PV(CostAT) =

PV(CFAT) = \$633,232.46 - \$264,986.52 = \$368,245.94

NPV = -\$500,000 + \$118,616.24 + \$25,401.33 + \$368,245.94 = \$12,263.51

B. Beginning values of revenue and costs are multiplied by (1 + corresponding growth rate)

C. Both revenue and costs computed as growing perpetuities rather than growing annuities

D. B) and C) combined

Practice Problems

98. Explain what externalities are and give an example.

Type: Definition Difficulty: Medium LO: 14.1

Suggested answer:

Externalities are the consequences that result from an investment that may benefit or harm unrelated third parties.

An example of an external benefit is when a logging company builds a road in a rural area and allows access to the public.

An example of an external cost is a pulp and paper mill that disposes of its waste in the local waterways.

99. A piece of land outside of Toronto was purchased ten years ago for \$100,000 by a real estate development corporation. The company later spent \$150,000 to clear and level the property. The company has two options: the land can be sold today for \$600,000, or the land can be converted into a strip mall. In evaluating the capital budget for the strip mall, what price should the land be valued at?

Type: Calculation Difficulty: Medium LO: 14.1

Suggested answer:

The land should be valued at its opportunity cost of \$600,000. The \$100,000 cost of the land and the \$150,000 spent to improve the land are sunk costs and are not relevant.

100. A Bromont ski equipment manufacturer is thinking about developing and producing a new line of super-side-cut skis. The finance department has estimated that the NPV of this stand alone project would be significantly positive relative to the initial investment. However, the CFO has

serious concerns about the NPV analysis because it fails to take into account the significant negative interdependencies. What is the most likely issue here and how should it be accounted for?

Type: Concept Difficulty: Difficult LO: 14.1

Suggested answer:

The main problem is that proceeding with this new line of ski will likely have a strong negative impact on the firm's existing lines of skis. This would result in a negative impact on sales which has not yet been recognized in the capital budgeting process.

101. A firm is considering launching a new product into the market. The research and development team showed that the new product is superior to the existing product and would not need the many spare parts currently required that the company must provide. How should the finance department evaluate this project?

Type: Calculation Difficulty: Medium LO: 14.1

Suggested answer:

The project evaluation should take into consideration the incremental cash flows of the project. This implies that the finance department should take into consideration the effect of the decrease in sales of the old product because of the sale of the new product. Furthermore, since the new product sales have a direct effect on the spare parts, this must too be considered along with how the reduction in spare parts affects the sales of other departments of the firm.

102. Explain how you would estimate the change in working capital in the firm by using financial statements.

Type: Calculation Difficulty: Medium LO: 14.1

Suggested answer:

The change in working capital comes mainly from the change in the account receivables, payables and inventory. These accounts are important for the day to day operations of the firm. In order to infer the change in the working capital one should calculate the difference between current assets and current liabilities on the balance sheet between two accounting periods.

103. Explain why the CCA tax savings are discounted at the firm's cost of capital.

Type: Concept Difficulty: Difficult LO: 14.1

Suggested answer:

The CCA tax savings are as risky as the firm's pre-tax income, because without any pre-tax income, the CCA tax shields are worthless and the Canada Revenue Agency places restrictions on the transfer of CCA tax shields within different types of firms. For this reason, they are discounted at the firm's cost of capital.

104. Discuss the two ways inflation impacts capital budgeting.

Type: Concept Difficulty: Medium LO: 14.5

Suggested answer:

1. Inflation affects future levels of sales and expenses.
2. Inflation affects the level of interest rates and therefore affects the firm's cost of capital that is to be used in discounting future cash flows.

105. Which measure of inflation do you think should be used in capital budgeting: historical inflation or expected inflation. Explain why?

Type: Concept Difficulty: Difficult LO: 14.5

Suggested answer:

Inflation is the purchasing power of every dollar in the future. If historical inflation is used we assume that the inflation will be similar to what happened in the past. If inflation in the future is different than the past, we will have a different result. On the other hand, expected inflation is forecasted and adaptive to the future. So, we should use expected inflation.

106. Why do cash flows need to be projected in nominal terms when market discount rates are used?

Type: Concept Difficulty: Medium LO: 14.5

Suggested answer:

If a capital budget fails to incorporate forecasts of price-level changes into the future cash flows of the project, but they discount at rates that reflect the current market cost of funds, the resulting analysis may be significantly distorted.

107. Explain the importance of scenario analysis in capital budgeting.

Type: Concept Difficulty: Medium LO: 14.3

Suggested answer:

When conducting a capital budgeting exercise, there are a lot of assumptions about the cash flows, cost of capital, and costs. By using scenario analysis, we incorporate different probabilities of changes in the values. This helps in making the right decision about the project because “what if” analysis provides more confidence in the calculations.

108. Explain the difference between breakeven analysis and scenario analysis and the role each plays in decision making.

Type: Concept Difficulty: Medium LO: 14.3

Suggested answer:

Breakeven analysis and scenario analysis serve the same purpose. Both procedures provide a “what if” analysis that enriches the extent of the analysis of the capital budgeting exercise. However, the difference between the two relies on the representation of the results. Breakeven analysis provides a threshold for the project to be accepted. On the other hand, scenario analysis provides an outcome given different scenarios and must be weighted using certain subjective probabilities.

109. How does the capital budgeting analysis of a new project differ from the replacement of a project in terms of their calculations?

Type: Concept Difficulty: Medium LO: 14.4

Suggested answer:

The procedure to estimate both decisions is the same. The only difference is in terms of the treatment of cash flows. Remember that we have to discount all incremental cash flows when doing a capital budgeting project. So, in the case of a replacement we need to estimate the difference between cash flows at both scenarios: the replacement or not. The differences between the two options are the incremental cash flows that have to be discounted.

110. HMS Corporation is considering an expansion project that requires investment in capital assets of \$545,000, costs of \$15,000 to modify the assets before they can be put into operation, and additional raw materials inventory of \$50,000 to support the project. In addition, HMS had spent \$25,000 to study the viability of this project. The one-time after-tax opportunity costs associated with this project are \$36,000. The project is expected to generate operating revenue of \$600,000 per year, and the associated operating expenses are estimated at \$275,000 per year. The capital assets belong to asset class 9, which has a CCA rate of 30 percent. The assets are expected to sell for \$42,000 when the project terminates in eight years. Assume the asset class remains open after the project terminates. The firm's cost of capital is 14 percent and marginal tax rate is 40 percent.

- A. What is the initial after-tax cash flow?
- B. What is the present value of the CCA tax savings?
- C. What is the present value of the after-tax operating cash flows?
- D. What is the ending after-tax cash flow?
- E. What is the NPV of the project?

Type: Calculation Difficulty: Medium LO: 14.3

Suggested Answer

$$A. CF_0 = \$545,000 + \$36,000 + \$50,000 + \$15,000 = \$646,000$$

$$9 \text{ } PV(CCATS) = \frac{\$560,000 \cdot .4 \cdot .3}{(.14 + .3)} \times \frac{1.07}{1.14} - \frac{\$42,000 \cdot .4 \cdot .3}{(.14 + .3)} \times \frac{1}{1.14^8} = \$139,333.79 \text{ } P$$

$$\frac{\$42,000 + \$50,000}{1.14^8} = \$32,251.43$$

$$D. PV(ECF) =$$

$$E. NPV = -\$646,000 + \$139,333.79 + \$904,578.46 + \$32,251.43 = \$430,163.68$$

111. Suppose that Alberta Energy Gas Corporation is considering investing \$700,000 in machinery that produces a different line of products from the firm's current operations. In addition, the firm needs to invest \$80,000 in raw materials inventory to support the project. The project is expected to generate operating cash flows of \$120,000 in year 1, \$160,000 in year 2, \$220,000 in year 3, \$300,000 in year 4, \$250,000 in year 5, \$200,000 in year 6, and \$120,000 in year 7. The machinery has a CCA rate of 30 percent and is expected to have a salvage value of \$42,000 at the end of seven years. Assume the machinery is the only asset in the asset class. The management demands the project to pay a 2.5 percent extra risk premium compared to the firm's cost of capital of 10 percent. The firm's marginal tax rate is 35 percent.

- A. What is the present value of the CCA tax shield?
- B. What is the present value of the operating cash flows?
- C. What is the NPV of the project?

Type: Calculation Difficulty: Medium LO: 14.3

Suggested answer

$$A. \text{Project's discount rate} = 10\% + 2.5\% = 12.5\%$$

$$\text{Ending } UCC_7 = \$700,000 \cdot (1 - 30\%/2) \cdot (1 - 30\%)^6 = \$70,001.16$$

$$PV(CCATS) = \frac{\$700,000 * .35 * .3}{(.125 + .3)} \times \frac{1.0625}{1.125} - \frac{\$42,000 * .35 * .3}{(.125 + .3)} \times \frac{1}{1.125^7} - \frac{(\$42,000 - \$70,001.16) * .35}{1.125^7} = \$163,080.75$$

$$PV(CFAT) = \left[\frac{\$120,000}{1.125} + \frac{\$160,000}{1.125^2} + \frac{\$220,000}{1.125^3} + \frac{\$300,000}{1.125^4} + \frac{\$250,000}{1.125^5} + \frac{\$200,000}{1.125^6} + \frac{\$120,000}{1.125^7} \right] \times (1 - 35\%) = \$562,178.33$$

$$PV(ECF) = \frac{\$42,000 + \$80,000}{1.125^7} = \$53,492.41$$

$$NPV = -\$780,000 + \$163,080.75 + \$562,178.33 + \$53,492.41 = -\$1,248.51$$

112. Abitibi Pulp Firm is considering a new product line for its existing table business. It has developed a new type of computer table that will protect the computer during an earthquake. It would like you to analyze the feasibility of the venture and suggests a break-even bid price. It provides you with the following details:

- Marketing analysis indicates technology companies in Silicon Valley will buy 250 tables each year for four years.
- The consultant who did the marketing research charged a fee of \$15,000.
- The firm estimates that the variable cost per table is \$100. For this project the firm would require extra factory space at a cost of \$25,000 per year, overhead costs such as heating and lighting would amount to \$4,000 per year and wages and salaries would total \$75,000 per year.
- The machinery required for the new product line would cost \$200,000, and have a salvage value of \$50,000 at the end of 4 years. The machinery belongs to CCA class 16 and has a 15 percent declining balance rate.
- Additional working capital of \$150,000 would be required to get the project started.
- The corporate tax rate is 40 percent and the required rate of return is 12 percent.

What price should Abitibi charge for each table?

Type: Calculation Difficulty: Medium LO: 14.3, 14.4

Suggested answer:

$$\frac{\$200,000 * .4 * .15}{(.12 + .15)} \times \frac{1.06}{1.12} - \frac{\$50,000 * .4 * .15}{(.12 + .15)} \times \frac{1}{1.12^4} = \$35,002.18$$

$$PV(CCATS) =$$

$$PV(\text{CostAT}) = (\$100 * 250 + \$25,000 + \$4,000 + \$75,000) * (1 - 40\%) * PVA(12\%, 4)$$

$$\frac{\$50,000 + \$150,000}{1.12^4} = \$127,103.62$$

PV(ECF) =

$$\frac{\$422,985.04}{PVAF(12\%, 4)} \times \frac{1}{(1 - 40\%)} = \$232,102.07$$

$$\frac{\$232,102.07}{250} = \$928.41$$

Price per table =

113. A firm is considering purchasing a new machine, which costs \$600,000 and has a six-year life, a CCA rate of 25 percent, and an expected salvage value of \$40,000. The project will generate sales revenue of \$200,000 in the first year, which will grow at 6 percent per year in the subsequent years. Variable costs will be \$80,000 for the first year, which will grow at 7 percent per year. The firm's marginal tax rate is 35 percent and required return is 10 percent.

- Calculate the present value of CCA.
- Calculate the present value of ending cash flow.
- Calculate the present value of after tax cost and revenue.
- Calculate the NPV.
- Should the project be accepted?

Type: Calculation Difficulty: Medium LO: 14.3

Suggested answer:

$$A. PVCCATS = 600000 \times 0.35 \times 0.25 (0.1 + 0.25) \times 1.051.10 -$$

$$40000 \times 0.35 \times 0.25 (0.1 + 0.25) \times 11.16 = \$137,537.08$$

$$B. PVECF = 40000 \times 1.16 = 22,578.96$$

$$C. PVRevenues = 200000 \times (1 - 0.35) (0.1 - 0.06) - 200000 \times 1 - 0.35 \times (1.06)^6 (0.1 -$$

$$0.06) \times 1.16 = \$647,669.56$$

$$PVCosts = 80000 \times (1 - 0.35)(0.1 - 0.07) - 80000 \times 1 - 0.35 \times (1.07)^6 (0.1 - 0.07) \times 1.16 = \$264,986.52$$

$$D. NPV = -600000 + 137537.08 + 22587.96 + 647669.56 - 264986.52 = -57200.93$$

E. Given the negative NPV, the project should be rejected.

114. Delta Corporation is considering an investment of \$400,000 in a new machine, which belongs to asset class 43 with a CCA rate of 30 percent. The machine is not the only asset in the asset class. The firm's effective tax rate is 40 percent. The company has the following estimates:

	Base case	Best case	Worst case
Project life	6 years	8 years	4 years
Discount rate (k)	10%	8%	12%
Salvage value	\$50,000	\$60,000	\$40,000
Annual after-tax operating cash flows	\$80,000	\$100,000	\$60,000

G)

H) **A. Determine the NPV for each scenario.**

B. Would you recommend the company to undertake the project if each scenario is equally likely? Why?

Type: Calculation

Difficulty: Medium LO: 14.3, 14.4

Suggested answer

$$\begin{aligned}
 PV(CCATS) &= \frac{\$400,000 \cdot 0.4 \cdot 0.3}{(.1 + .3)} \times \frac{1.05}{1.10} - \frac{\$50,000 \cdot 0.4 \cdot 0.3}{(.1 + .3)} \times \frac{1}{1.10^6} = \$106,078.35 \\
 PV(CFAT) &= \$80,000 \cdot PVAF(10\%, 6) = \$348,420.86 \\
 PV(ECF) &= \frac{\$50,000}{1.10^6} = \$28,223.70 \\
 NPV &= -\$400,000 + \$106,078.35 + \$348,420.86 + \$28,223.70 = \$82,722.91
 \end{aligned}$$

$$\begin{aligned}
 PV(CCATS) &= \frac{\$400,000 \cdot 0.4 \cdot 0.3}{(.08 + .3)} \times \frac{1.04}{1.08} - \frac{\$60,000 \cdot 0.4 \cdot 0.3}{(.08 + .3)} \times \frac{1}{1.08^8} = \$111,400.75 \\
 PV(CFAT) &= \$100,000 \cdot PVAF(8\%, 8) = \$574,663.89 \\
 PV(ECF) &= \frac{\$60,000}{1.08^8} = \$32,416.13 \\
 NPV &= -\$400,000 + \$111,400.75 + \$574,663.89 + \$32,416.13 = \$318,480.77
 \end{aligned}$$

$$PV(CCATS) = \frac{\$400,000 * .4 * .3}{(.12 + .3)} \times \frac{1.06}{1.12} - \frac{\$40,000 * .4 * .3}{(.12 + .3)} \times \frac{1}{1.12^4} = \$100,900.20$$

$$PV(CCATS) = \$60,000 * PVAF(12\%, 4) = \$182,240.96$$

$$PV(ECF) = \frac{\$40,000}{1.12^4} = \$25,420.72$$

$$NPV = -\$400,000 + \$100,900.20 + \$182,240.96 + \$25,420.72 = -\$91,438.12$$

$$\frac{\$82,722.91 + \$318,480.77 - \$91,438.12}{3} = \$103,255.19$$

B. The Expected NPV =

The base case NPV suggests that the project should be accepted because it generates a positive NPV. The best case NPV suggests that the project is very attractive and should be accepted. The worst case NPV suggests that the project is unattractive and should be rejected.

Examining these three scenarios reveals that the project is risky. Although it seems attractive and has significant upside it could still turn out to be a losing proposition.

Given the project's expected NPV is a positive large value, the project should be accepted.

115. A firm is considering an investment of \$480,000 in new equipment to replace old equipment with a book value of \$95,000 and a market value of \$63,000. If the firm replaces the old equipment with new equipment, it expects to save \$120,000 in operating costs the first year. The amount of savings will grow at a rate of 8 percent per year for each of the following five years. Both pieces of equipment belong to asset class 8, which has a CCA rate of 20 percent. The salvage values of both the old equipment and the new equipment at the end of six years are \$11,000 and \$78,000, respectively. There are other assets in the asset class when the project terminates. In addition, replacement of the old equipment with the new equipment requires an immediate increase in net working capital of \$50,000. The firm's marginal tax rate is 35 percent and cost of capital is 11 percent.

A. What is the initial after-tax cash flow?

B. What is the present value of the incremental CCA tax savings?

C. What is the present value of the incremental after-tax operating cash flows?

D. What is the present value of the incremental ending after-tax cash flow?

E. What is the NPV of the replacement project?

Type: Calculation Difficulty: Medium LO: 14.3, 14.4

Suggested answer:

$$A.CF_0 = \$480,000 - \$63,000 + \$50,000 = \$467,000$$

$$PV(CCATS) = \frac{\$417,000 * .35 * .2}{(.11 + .2)} \times \frac{1.055}{1.11} - \frac{\$67,000 * .35 * .2}{(.11 + .2)} \times \frac{1}{1.11^6} = \$81,407.04$$

C. CFBT's growth rate = 8%

CFBTs of year 1-6: \$120,000; \$129,600; \$139,968; \$151,165; \$163,259; \$176,319

$$PV(CFAT) = \left[\frac{\$120,000}{1.11} + \frac{\$129,600}{1.11^2} + \frac{\$139,968}{1.11^3} + \frac{\$151,165}{1.11^4} + \frac{\$163,259}{1.11^5} + \frac{\$176,319}{1.11^6} \right] \times (1 - 35\%) = \$394,139.68$$

$$\frac{\$67,000 + \$50,000}{1.11^6} = \$62,552.98$$

D. PV(ECF) =

E. NPV = $-\$467,000 + \$81,407.04 + \$394,139.68 + \$62,552.98 = \$71,099.70$

116. A firm is considering a project that requires an initial investment of \$300,000 in new equipment, which has a five-year life and a CCA rate of 30 percent. An initial investment in raw materials inventory of \$50,000 is also required to support the project, which will rise to 15 percent of sales. The project will generate sales revenue of \$400,000 in the first year, which will grow at 4 percent per year. Variable costs will be \$220,000 for the first year, which will also grow at 6 percent per year. The project's fixed costs are \$40,000 per year. The expected salvage value of the asset is \$45,000 at the end of five years. The firm's marginal tax rate is 40 percent and required return is 12.5 percent. Assume the asset class remains open after the project terminates.

A. What is the present value of the CCA tax savings?

B. What is the present value of the after-tax operating cash flow?

C. What is the present value of the change in net working capital?

D. What is the NPV of the project?

Type: Calculation Difficulty: Difficult LO: 14.3, 14.4

$$PV(CCATS) = \frac{\$300,000 \times .4 \times .3}{(.125 + .3)} \times \frac{1.0625}{1.125} - \frac{\$45,000 \times .4 \times .3}{(.125 + .3)} \times \frac{1}{1.125^5} = \$72,949.14$$

$$PV(FCAT) = \$40,000 \times (1 - 40\%) \times PVAF(12.5\%, 5) = \$85,453.64$$

$$\frac{\$400,000 \times (1 - 40\%)}{.125 - .04} - \frac{\$400,000 \times (1 - 40\%) \times (1.04)^5}{(.125 - .04) \times (1.125)^5} = \$917,206.80$$

$$\frac{\$220,000 \times (1 - 40\%)}{.125 - .06} - \frac{\$220,000 \times (1 - 40\%) \times (1.06)^5}{(.125 - .06) \times (1.125)^5} = \$522,679.13$$

PV(CostAT) =

PV(CFAT) = $\$917,206.80 - \$522,679.13 - \$85,453.64 = \$309,074.03$

C. Ending NWC = 15% of sales

Year	0	1	2	3	4	5
Revenue		\$400,000	\$416,000	\$432,640	\$449,946	\$467,943
Ending NWC	\$50,000	\$60,000.00	\$62,400.00	\$64,896.00	\$67,491.84	\$0.00
Beginning NWC	\$0.00	\$50,000.00	\$60,000.00	\$62,400.00	\$64,896.00	\$67,491.84

Change in NWC	-\$50,000	-\$10,000.00	-\$2,400.00	-\$2,496.00	-\$2,596.00	\$67,491.84
PV(Change in NWC)	-\$50,000	-\$8,888.89	-\$1,896.30	-\$1,753.02	-\$1,620.57	\$37,453.18

$$PV(\text{Change in NWC}) = \$(-50,000 - 8,888.89 - 1,896.3 - 1,753.02 - 1,620.57 + 37,453.18) = -$$

$$\frac{\$45,000}{1.125^5} = \$24,971.80$$

D. terminal cash flow:

$$NPV = -\$300,000 - \$26,705.60 + \$72,949.14 + \$309,074.02 + \$24,971.80 = \$80,289.36$$

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Chapter 15: Mergers and Acquisitions

Multiple Choice Questions

Section 15.1 – Types of Takeovers

1. What is the key difference between a merger and an acquisition?

- A. The target firm ceases to exist after a merger, but can continue on after an acquisition.
- B. The target firm ceases to exist after an acquisition, but can continue on after a merger.
- C. An acquisition requires the approval of both sets of shareholders from the two firms.
- D. There is no difference between a merger and an acquisition.

Answer: B Type: Definition Difficulty: Easy LO: 15.1

2. Which of the following **best** defines an acquisition?

- A. Two firms combining to form a completely new firm.
- B. One firm purchases goods from another firm.
- C. One firm completely absorbing another firm.
- D. All of the above.

Answer: C Type: Definition Difficulty: Easy LO: 15.1

3. The Canadian term for a merger process is called a(n):

- A. Amendment
- B. Combination
- C. Amalgamation
- D. Joint venture

Answer: C Type: Definition Difficulty: Easy LO: 15.1

4. In terms of shareholder approval requirements, the main difference between a cash transaction and a share transaction is:

- A. The approval of both sets of shareholders is often required for a cash transaction, but not for a share transaction.
- B. The approval of both sets of shareholders is often required for a share transaction, but not for a cash transaction.
- C. No approval is required for share transactions where the deal value is less than 50% of the value of shares outstanding.
- D. The approval of the acquiring firm's shareholders is required for a cash transaction.

Answer: B Type: Definition Difficulty: Easy LO: 15.1

5. The fraction of shareholders required to approve an amalgamation agreement (assuming no disputes) is at least:

- A. 20%
- B. 50.01%
- C. 66.67%
- D. 75%

Answer: C Type: Definition Difficulty: Easy LO : 15.1

6. Which of the following is another term for a “going private” transaction?

- A. Acquisition

- B. Initial public offering
- C. Merger
- D. Issuer bid

Answer: D Type: Definition Difficulty: Easy LO: 15.1

7. An issuer bid occurs when:

- I. An acquirer owns a majority stake of a target firm and wishes to acquire the remainder.
- II. A potential acquirer with no stake in the target firm makes an offer for 50% of the shares.
- III. An acquirer who owns a majority stake in the target recommends new management be put in place.
- IV. An acquirer wishes to reverse its purchase of the target firm.

- A. I only
- B. I and II
- C. II and III
- D. IV only

Answer: A Type: Definition Difficulty: Medium LO: 15.1

8. Use the following statements to answer the question:

- I. The holdup problem consists of small shareholders asking for an excessive price to tender their shares in case of amalgamation.
- II. Sweetening the deal results in increasing the price for the remaining shares to encourage the holders to sell their shares.

- A. I and II are correct
- B. I and II are incorrect
- C. I is correct and II is incorrect
- D. I is incorrect and II is correct

Answer: A Type: Concept Difficulty: Medium LO: 15.1

9. Which of the following is a side effect of the Free Trade Agreement (FTA)?

- A. US firms no longer wanted to acquire or merge with Canadian companies.
- B. Canadian firms increased the public float held by Canadian investors.
- C. US multinationals began buying out the Canadian minority shareholders.
- D. All of the above.

Answer: C Type: Concept Difficulty: Medium LO: 15.1

10. Use the following statements to answer the question:

- I. A merger is the combination of two companies into a new entity.
- II. An amalgamation is the exchange of shares in the old companies for shares in the new entity.

- A. I is correct and II is correct
- B. I is incorrect and II is incorrect
- C. I is correct and II is incorrect
- D. I is incorrect and II is correct

Answer: A Type: Concept Difficulty: Medium LO: 15.1

11. A fairness opinion is used most often when:

- A. An unsolicited hostile tender offer is received from a potential acquirer who owns no stake in the target firm.
- B. A controlling shareholder seeks approval for an amalgamation.
- C. Determining whether the exchange ratio in a stock swap transaction is appropriate.
- D. None of the above.

Answer: B Type: Concept Difficulty: Easy LO: 15.1

12. Which of the following is a safeguard against a controlling shareholder abusing his/her information advantage?

- A. Minority of the majority approval requirements
- B. Fairness opinion
- C. Full disclosure requirements
- D. All of the above.

Answer: B Type: Concept Difficulty: Medium LO: 15.1

13. Moose Travel, Inc. (MT) owns 53% of Prairies Airways, Inc. (PA) and wishes to make an issuer bid. From what fraction of the PA shareholders does MT require approval for this deal to be successful?

- A. 12%
- B. 10% plus a majority of the minority
- C. 14% plus a majority of the minority
- D. 47%

Answer: C Type: Definition Difficulty: Medium LO: 15.1

Section 15.2 – Securities Legislation

14. Securities legislation is a:

- A. Federal responsibility.
- B. Provincial responsibility.
- C. National responsibility.
- D. Both federal and provincial responsibility.

Answer: B Type: Definition Difficulty: Easy LO: 15.2

15. In Canada, the early warning threshold is hit when an investor purchases what percent of shares?

- A. 5%
- B. 10%
- C. 25%
- D. 33.33%

Answer: B Type: Definition Difficulty: Easy LO: 15.2

16. Once an investor has purchased 20% of the outstanding shares of a firm, which of the following is **not** allowed?

- A. Open market share purchase with a takeover bid.
- B. Open market sale of the stake.
- C. Open market share purchase without a takeover bid.
- D. A hostile takeover bid.

Answer: C Type: Definition Difficulty: Medium LO: 15.2

17. A minority squeeze-out occurs when:

- A. Minority shareholders change the top management of the firm.
- B. When an acquirer owns 90% of the shares, the minority of the shareholders are forced to sell their shares for the takeover price.
- C. A small minority of shareholders frustrate a fair bid that has already been accepted by a majority of shareholders.
- D. All of the above.

Answer: B Type: Definition Difficulty: Easy LO: 15.2

18. In the US the threshold of early warning is:

- A. 5%
- B. 10%
- C. 20%
- D. 30%

Answer: A Type: Concept Difficulty: Easy LO: 15.2

19. Why is the two part tender offer illegal in Canada?

- A. Because it discriminates between shareholders.
- B. Because shareholders are not consulted in the deal.
- C. Because the price is not fair.
- D. Because it creates a rush to sell at the higher price.

Answer: D Type: Concept Difficulty: Medium LO: 15.2

20. Use the following statements to answer this question:

- I. Each province is responsible for the mergers and acquisition within its own jurisdiction.
- II. The Ontario Security Commission regulates most of the public deals in Canada.

- A. I is correct and II is correct
- B. I is incorrect and II is incorrect
- C. I is correct and II is incorrect
- D. I is incorrect and II is correct

Answer: A Type: Concept Difficulty: Medium LO: 15.2

21. What was the reason of the failure of the leveraged buyout of BCE Inc. by the Ontario Teacher's Pension Plan?

- A. The refusal of shareholders
- B. The refusal of the bondholders
- C. The change in value of the firm
- D. Regulatory refusal

Answer: C Type: Concept Difficulty: Medium LO: 15.2

22. Which of the following is not one of the benefits of obtaining a toehold?

- A. Acquiring shares at the market price requires no premium.
- B. A toehold reduces the number of shares needed to be purchased in a later takeover bid.
- C. A toehold eliminates competition from other potential acquirers.

D. A toehold can increase the probability of success of a later takeover.

Answer: C Type: Concept Difficulty: Medium LO: 15.2

23. Which of the following is **not** a reason why a takeover can be exempted from the Ontario Securities Act?

A. There is limited involvement by shareholders in Ontario.

B. The firm being taken over is private.

C. The acquirer is buying shares from fewer than five shareholders and paying a premium of less than 15% over the market price.

D. The transaction is merely a stock swap between two firms and no money changes hands.

Answer: D Type: Definition Difficulty: Medium LO: 15.2

Section 15.3 – Friendly versus Hostile Takeovers

24. Which of the following is a document describing a target firm's important characteristics to potential acquirers?

A. Letter of intent

B. Offering memorandum

C. Prospectus

D. Break form

Answer: B Type: Definition Difficulty: Easy LO: 15.3

25. Which of the following best describes a no-shop clause?

A. The target firm agrees not to find another buyer, demonstrating its commitment to completing the transaction.

B. The acquiring firm agrees not to find another target, demonstrating its commitment to completing the transaction.

C. Once a potential acquirer makes an offer, no other buyers can make a bid for the target firm.

D. All of the above.

Answer: A Type: Concept Difficulty: Easy LO: 15.3

26. Which of the following is **not** a purpose of a break fee?

A. To reward the original acquirer for generating a competing bid.

B. To compensate the original acquirer for the costs incurred in negotiations.

C. To signal the high value of the target firm to the original acquiring firm.

D. To reduce the probability that a potential acquirer will back out of negotiations.

Answer: C Type: Concept Difficulty: Easy LO: 15.3

27. Place the following acquisition steps in chronological order, starting with the earliest:

I. Sign letter of intent

II. Final sale agreement

III. Ratification

IV. Main due diligence

V. Confidentiality agreement

A. V, I, IV, II, and III

B. IV, I, III, V, and II

C. II, III, IV, V, and I

D. V, IV, I, II, and III

Answer: A Type: Definition Difficulty: Medium LO: 15.3

28. Use the following statements to answer this question:

I. A letter of intent is a preliminary sale agreement.

II. The break fee is the amount paid for the due diligence process.

A. I is correct and II is correct

B. I is incorrect and II is incorrect

C. I is correct and II is incorrect

D. I is incorrect and II is correct

Answer: A Type: Concept Difficulty: Medium LO: 15.3

29. Use the following statements to answer this question:

I. The friendly acquisition process involves investigating the value of the firm using public information.

II. The data room provides specific information about the acquiring firm's valuation process.

A. I is correct and II is correct

B. I is incorrect and II is incorrect

C. I is correct and II is incorrect

D. I is incorrect and II is correct

Answer: C Type: Concept Difficulty: Medium LO: 15.3

30. When an acquiring firm bypasses current management and makes a direct offer to purchase stock from the shareholders, it is termed a:

A. Leveraged buyout

B. Hostile takeover

C. Tender offer

D. Corporate buy-out

Answer: C Type: Definition Difficulty: Easy LO: 15.3

31. A large amount of trading after a hostile tender offer is made, is a good sign for the acquirer because:

A. The shares are moving from regular investors into the hands of arbitrageurs.

B. A competing offer is likely.

C. The acquirer will pay a lower premium for the shares.

D. A large amount of trading is a bad sign for the acquirer.

Answer: A Type: Concept Difficulty: Medium LO: 15.3

32. Arbitrageurs predict what happens in takeovers and attempt to earn profits by:

A. Buying target firm shares after the tender offer announcement and selling the shares later for a higher premium.

B. Selling acquiring firm shares before the tender offer announcement and buying the shares later at a lower price.

C. Charging commissions for their advice to target and acquiring firms.

D. None of the above.

Answer: A Type: Concept Difficulty: Medium LO: 15.3

33. Which of the following is FALSE about the friendly acquisition process?

- A. A friendly acquisition involves estimating the value of the firm using information provided by the firm.
- B. The due diligence process is the investigating of the correctness of information provided by the target.
- C. The no shop clause prohibits the acquiring firm to look into other target firms.
- D. The confidentiality agreement prohibits the disclosure of the private information about the target firm.

Answer: C Type: Concept Difficulty: Medium LO: 15.3

34. A firm decides to defend itself from a hostile takeover. Management tries to solicit competing takeover bids from other firms. This defense involves the use of a:

- A. Poison pill
- B. White knight
- C. Shareholders' rights plan
- D. Tender offer

Answer: B Type: Concept Difficulty: Medium LO: 15.3

35. _____ involve issuing special securities that entitle the holders to unusual rights and privileges if the issuing firm becomes the subject of a takeover bid.

- A. Poison pills
- B. Tender offers
- C. White knights
- D. Legal barriers

Answer: A Type: Concept Difficulty: Easy LO: 15.3

36. Which one of the following is an example of a poison pill?

- A. A firm that sells its efficient business division because it interests the acquirer.
- B. A firm that pays all its cash as dividends to existing shareholders because it interests the acquirer.
- C. A firm that opens talks with another potential acquirer.
- D. A firm that distributes new shares to the existing shareholders at a discount, in the event of a takeover.

Answer: D Type: Concept Difficulty: Medium LO: 15.3

37. What is the main difference between the US and Canada in terms of the use of poison pills?

- A. In Canada, poison pills are illegal.
- B. In the US poison pills cannot be challenged in court.
- C. In Canada, courts always dismiss the usage of poison pills.
- D. In Canada, poison pills are used to delay the acquisition in case of the existence of another bidder.

Answer: D Type: Concept Difficulty: Medium LO: 15.3

38. Which of the following are possible defenses that a target firm can use against an unfriendly acquiring firm? The target firm may:

- I. Sell attractive assets
- II. Issue additional voting shares to dilute voting power
- III. Assume a heavy debt burden
- A. III only
- B. I and II
- C. II and III
- D. I, II, and III

Answer: D Type: Concept Difficulty: Medium LO: 15.3

39. In Canada, which of the following are possible defenses that a target firm can use against an unfriendly acquiring firm? The target firm may:

- I. Change the company bylaws so that the successful bidder may be prevented from quickly replacing the existing board of directors.
- II. Attempt to buy the shares of the pursuing firm.
- III. Argue through the courts that the takeover violates the substance or procedures set out in an applicable statute.
- IV. Issue additional voting shares to dilute earnings per share.

- A. I and III
- B. II, III, and IV
- C. I, II, and III
- D. I, III, and IV

Answer: C Type: Concept Difficulty: Medium LO: 15.3

40. Use the following statements to answer this question:

- I. The white knight is a strategy to avoid being acquired by another firm.
- II. Selling the crown jewels can lead to a long term decrease in the value of the firm.
- A. I is correct and II is correct
- B. I is incorrect and II is incorrect
- C. I is correct and II is incorrect
- D. I is incorrect and II is correct

Answer: D Type: Concept Difficulty: Medium LO: 15.3

Section 15.4 – Motivations of Mergers and Acquisitions

41. If an automobile manufacturer and a steelworks producer decided to merge, it would be an example of a:

- A. Horizontal merger
- B. Vertical merger
- C. Conglomerate merger
- D. None of the above

Answer: B Type: Concept Difficulty: Medium LO: 15.4

42. Which of the following represent possible source(s) of increased value when a merger or acquisition takes place?

- A. Improved management
- B. Tax considerations
- C. Improved financing

D. All of the above.

Answer: D Type: Concept Difficulty: Easy LO: 15.4

43. If the target and acquirer have initial values of \$100 million and \$150 million, respectively, and the combined firm is worth \$400 million, then the synergy value is:

- A. \$50 million
- B. \$400 million
- C. \$150 million
- D. \$100 million

Answer: C Type: Calculation Difficulty: Easy LO: 15.4

How each option was obtained:

- A. \$50 million = \$150 million – \$100 million
- B. \$400 million = value of combined firm
- C. \$150 million = \$400 million – \$100 million – \$150 million
- D. \$100 million = value of target alone

44. Which of the following is **not** an example of economies of scale?

- A. Reducing capacity
- B. Geographic roll-up
- C. Spreading fixed costs
- D. Complementary strengths

Answer: D Type: Concept Difficulty: Easy LO: 15.4

45. Empirical evidence regarding **merger gains** shows that, on average:

- A. Target firm shareholders experience a significant gain.
- B. Acquiring firm shareholders experience a significant gain, while target firm shareholders gain nothing.
- C. Target firm shareholders experience no gain, while acquiring firm shareholders lose.
- D. None of the above.

Answer: A Type: Concept Difficulty: Easy LO: 15.4

46. Notre Dame Alliance Inc. (NDA) is worth \$3 billion and wants to take over Vancouver Company Inc. (VC), which is worth \$1.5 billion. NDA **expects** the deal to result in \$0.5 billion in synergies. Supposing a bidding war arises and NDA ends up paying \$2 billion **in cash** for VC, and then finds there are no synergies, how much has NDA gained or lost on the deal?

- A. NDA gains nothing and loses nothing on this deal.
- B. NDA loses \$0.5 billion on this deal.
- C. NDA loses \$1 billion on this deal.
- D. None of the above.

Answer: B Type: Calculation Difficulty: Medium LO: 15.4

How each option was obtained:

- A. \$0b = \$1.5b + \$0.5b – \$2b
- B. \$0.5b loss = \$1.5b + \$0.5b – \$0.5b – \$2b
- C. \$1b loss = \$1.5b – \$2b – \$0.5b

47. Notre Dame Alliance Inc. is worth \$3 billion and wants to take over Vancouver Company Inc., which is worth \$1.5 billion. NDA expects the deal to result in \$0.5 billion in synergies. Supposing a bidding war arises and NDA ends up paying \$2 billion **in a stock swap** for VC, and then finds there are no synergies, how much have NDA shareholders gained or lost on the deal?
- A. NDA shareholders lose \$0.33 billion on this deal.
 - B. NDA shareholders lose \$0.3 billion on this deal.
 - C. NDA shareholders lose \$0.5 billion on this deal.
 - D. None of the above.

Answer: B Type: Calculation Difficulty: Difficult LO: 15.4

How each option was obtained:

Since this is a stock swap transaction, original NDA shareholders own only $(\$3 \div 5) = 60\%$ of the new company. Thus, the loss to NDA shareholders is only \$0.3 billion instead of the \$0.5 billion it would have lost under a cash transaction.

- A. \$0.33b loss = $(\$0.5b \text{ lost premium}) \times (\$3 \div 4.5)$, valuing the new company at \$4.5b instead of \$5b.
- B. \$0.3b loss = $(\$0.5b \text{ lost premium}) \times (\$3 \div 5)$
- C. \$0.5b loss = lost premium **not** accounting for stock swap effect

48. When conducting shareholder value at risk (SVAR) analysis for acquisitions, it is found that:
- A. Acquirers using cash bear **all** of the **risk** of the acquisition, while the risk in acquisitions using share swaps is borne by both **sets of shareholders**.
 - B. Acquirers using stock swaps bear all of the risk of the acquisition, while the risk in acquisitions using cash is borne by **both sets of shareholders**.
 - C. The risk of an acquisition is always **borne** equally between the acquiring firm and target firm shareholders.
 - D. None of the above.

Answer: A Type: Concept Difficulty: Medium LO: 15.4

49. Which of the following is **not** true?

- A. The beneficiaries of a tender offer are normally **the shareholders** of the target firm.
- B. When management acts on its own authority, it does so mainly **to** further its own interests.
- C. When payment for an acquisition is made through the issuance of securities, the value of these new shares is a concern.
- D. Mergers tend to decrease during periods of soaring stock prices.

Answer: D Type: Concept Difficulty: Medium LO: 15.4

50. Which of the following statements is true?

- A. When a firm's assets are acquired, the liabilities are transferred to the vendor.
- B. The purchase of a target company's shares as a method of acquiring a firm's assets is attractive when the target company has contingent liabilities outstanding.
- C. With an acquisition, both assets and liabilities are taken over by the new parent.
- D. The purchase of shares must take place soon after the announcement of the intent to merge, thereby minimizing the premium over current market price that has to be paid.

Answer: C Type: Concept Difficulty: Medium LO: 15.4

51. Which one of the following is an example of economies of scope?

- A. Acquiring a firm to improve bargaining power in price negotiations
- B. Acquiring a firm to gain access to foreign markets
- C. Acquiring a firm to improve the production process
- D. Acquiring a firm to reduce the overall cost of production

Answer: D Type: Concept Difficulty: Medium LO: 15.4

52. A merger that allows a firm to access a cheaper way of financing its projects is:

- A. Financial economies of scope
- B. Financial Economies of scale
- C. Financial synergy
- D. Tax benefits

Answer: C Type: Concept Difficulty: Medium LO: 15.4

53. Use the following statements to answer this question:

- I. Managers may abuse their position and increase the size of the company through acquisitions.
- II. It is usually good news for shareholders when their firm is targeted.

- A. I is correct and II is correct
- B. I is incorrect and II is incorrect
- C. I is correct and II is incorrect
- D. I is incorrect and II is correct

Answer: A Type: Concept Difficulty: Medium LO: 15.4

Section 15.5 – Valuation Issues

54. Which of the following is **not** one of the requirements for the determination of fair market value (FMV)?

- A. Open and restricted markets
- B. Informed and prudent parties
- C. Arm's length transaction
- D. Neither party is under compulsion to transact

Answer: A Type: Definition Difficulty: Easy LO: 15.5

55. For acquisitions, which purchaser type values the resulting firm based on estimated cash flows as they are at present, with only minor adjustments?

- A. Strategic investors
- B. Financials
- C. Passive investors
- D. Managers

Answer: C Type: Concept Difficulty: Medium LO: 15.5

56. A management buyout is defined as:

- A. Severance payments made by an acquiring firm to target firm managers.
- B. Firm shareholders paying off management so that it can be replaced.
- C. A buyout in which the purchasers are a firm's managers.
- D. None of the above.

Answer: C Type: Definition Difficulty: Easy LO: 15.5

57. The valuation approach that uses ratios such as market-to-book (M/B), price-earnings (P/E), and price-to-cash flow (P/CF) is called:

- A. Liquidation valuation
- B. Discounted cash flow (DCF) valuation
- C. Multiples valuation
- D. All of the above

Answer: C Type: Definition Difficulty: Easy LO: 15.5

58. The main difference between reactive and proactive valuation models is:

- A. Reactive models determine what the value should be based on future values of cash flows and earnings while proactive models use general rules of thumb and the pricing of other securities.
- B. Reactive models focus on management expectations while proactive models use analyst forecasts.
- C. Proactive models determine what the value should be based on future values of cash flows and earnings while reactive models use general rules of thumb and the pricing of other securities.
- D. Reactive models are very ad hoc while proactive models are precise.

Answer: C Type: Concept Difficulty: Easy LO: 15.5

59. Which of the following is **not** a limitation of the liquidation valuation approach?

- A. It leads to imprecise estimates.
- B. The resulting value estimates are not forward-looking.
- C. The estimates change frequently and require constant updating.
- D. All of these are limitations of the liquidation valuation approach.

Answer: C Type: Concept Difficulty: Easy LO: 15.5

60. When conducting discounted cash flow (DCF) valuation using free cash flow to equity, the appropriate discount rate is:

- A. Cost of equity
- B. Risk-adjusted cost of equity
- C. Cost of debt
- D. Risk-adjusted cost of debt

Answer: B Type: Concept Difficulty: Easy LO: 15.5

61. An acquiring firm can increase its earnings per share (EPS) by:

- A. Acquiring a firm with a lower P/E ratio than its own P/E ratio.
- B. Acquiring a firm with a higher P/E ratio than its own P/E ratio.
- C. Acquiring a firm with a higher leverage ratio than its own leverage ratio.
- D. Acquiring a firm with a lower leverage ratio than its own leverage ratio.

Answer: A Type: Concept Difficulty: Medium LO: 15.5

62. A firm is evaluated using the liquidation valuation. Which one of the following would increase the value of the firm?

- A. High level of unrecoverable accounts receivable
- B. Amortization technique undervalues tangible assets
- C. Debt capacity of the firm is maximized
- D. Bankruptcy of major firm clients

Answer: B Type: Concept Difficulty: Medium LO: 15.5

63. The information for Montreal Design Inc. (MD) is provided below. What is its P/E ratio?

	(\$)
EBIT	5,000,000
Interest	1,250,000
EBT	3,750,000
Income Taxes (40%)	1,500,000
Net Income	2,250,000
Debt (Book value)	25,000,000
Equity (Book value)	25,000,000
Equity (Market value)	27,000,000

- A. 12x
- B. 6.7x
- C. 5.4x
- D. 11.1x

Answer: A Type: Calculation Difficulty: Easy LO: 15.5

How each option was obtained:

- A. $12x = \$27m \div \$2.25m$, using market value of equity and net income
- B. $6.7x = \$25m \div \$3.75m$, using book value of equity and EBT
- C. $5.4x = \$27m \div \$5m$, using market value of equity and EBIT
- D. $11.1x = \$25m \div \$2.25m$, using book value of equity and net income

Section 15.6 – Accounting for Acquisitions

64. Goodwill is calculated as the excess of:

- A. a target firm's purchase price over the FMV of its equity.
- B. a target firm's book value of assets over the book value of debt.
- C. the FMV of a target firm's equity over its purchase price.
- D. the FMV of the acquiring firm's equity over the FMV of the target firm's equity.

Answer: A Type: Definition Difficulty: Easy LO: 15.6

Practice Problems

65. Define and distinguish between acquisitions and amalgamations.

Type: Definition Difficulty: Easy LO: 15.1

Suggested answer:

Acquisitions – usually between two firms of different sizes. One firm loses its corporate identity and is absorbed by the other.

Amalgamation – both companies disappear and are replaced by an entirely new entity. Usually between two firms of comparable size.

66. Define synergy and explain what effect it can have on a merged company.

Type: Definition Difficulty: Easy LO: 15.2

Suggested answer:

Synergy is said to exist when the value of the combined company exceeds the sum of the value of the two firms being merged. Synergy can lead to increased efficiency, improved financing, lower costs, and so on.

67. List and briefly describe five possible sources of increased value when a merger or acquisition takes place.

Type: Definition Difficulty: Medium LO: 15.4

Suggested answers:

Synergy – when the value of the combined company exceeds the sum of the value of the two firms being merged.

Improved management – acquisitions can be used as tools for ousting underperforming managers.

Bargain prices – If shareholders place too low a value on a corporation's shares, a takeover might be profitable.

Market power – removing the competition.

Improved financing – Young firms may experience difficulty financing rapid growth, and merge with a more established, mature company that may have unused borrowing capacity or unused internal sources of funds.

Tax considerations – A profitable company may seek to take over a weaker company with losses that are not yet written off or which has large, unused deductions.

Search for liquidity and management skills – The owner of a privately held firm may not have a successor and may be forced to sell out in order to obtain liquidity for eventual retirement.

68. What is a tender offer?

Type: Definition Difficulty: Easy LO: 15.3

Suggested answer:

A tender offer is used by the acquiring firm either when negotiations with the management of the target firm break down or as an alternative to negotiations. The acquiring firm bypasses the management of the target firm and makes a direct appeal to the shareholders of the target company, asking them to tender their shares for sale.

69. List and briefly describe three defense strategies that the target firm may use against an unfriendly acquiring firm.

Type: Concept Difficulty: Medium LO: 15.3

Suggested answer:

I. The target company may be changed to make it less attractive as a takeover candidate.

II. Poison pill – target firm issues special securities that entitle the current holders to unusual rights and privileges if the issuing firm becomes the subject of a takeover bid.

III. Soliciting competing bids from white knights.

IV. Changing corporate bylaws to prevent the successful acquiring firm from replacing the board of directors or the management.

V. A counterattack may be launched by attempting to buy up the shares of the pursuing firm.

70. You are a shareholder of a publicly traded firm. You are asked by the firm's management to vote on a proposal to change the company's bylaws to "protect shareholders' interests in the event of an unfriendly takeover". Should you vote in favour of the proposal or against it? Why?

Type: Concept Difficulty: Difficult LO: 15.3

Suggested answer:

You should vote against the changes for the following reasons:

I. Shareholders of the target firm are the beneficiaries in unfriendly takeovers, as the value of their shares are bid up in the battle. You do not want to prevent this scenario.

II. The changes to the bylaws frequently focus on preventing the new management from removing the old management and the old board of directors.

This is an example of an agency cost to the shareholders, and therefore the proposal should be rejected.

71. What would be the motivation behind protecting the firm from an acquisition using a white knight strategy even though the deal increases the value of shareholders?

Type: Concept Difficulty: Difficult LO: 15.3

Suggested answer:

When the management is rushing into protecting the firm by trying to find a new bidder, there are evidences of managerial motivation for the bid. The managers are the first ones to lose their jobs in this scenario, so they try to find a bidder that would protect their position and allow them to stay in place. This behaviour is in opposition to shareholders benefit; it is an agency cost.

72. Beta Corporation is a manufacturing firm that is considering two acquisition targets. Gamma is a computer firm, while Delta is a manufacturing company. The relevant data are as follows:

	Beta	Gamma	Delta
Annual earnings	\$600,000	\$240,000	\$160,000
Shares outstanding	400,000	200,000	80,000
Market price per share	\$30	\$30	\$30
Earnings per share	\$1.50	\$1.20	\$2.00
Price-earnings ratio	20.0	25.0	15.0

The basis for the merger will be a share-for-share exchange based on market prices, and the share value of the combined firm is expected to remain unchanged. What would be the immediate effect of the two mergers on Beta Corp.'s earnings per share and price-earnings ratio? What other factors are important in Beta's analysis of its merger possibilities?

Type: Calculation Difficulty: Medium LO: 15.5

Suggested answer:

Let's first analyze Beta's merger with Gamma.

$$EPS = \frac{\$600,000 + \$240,000}{400,000 + 200,000} = \$1.40$$

$$\text{Price-earnings ratio} = 30/1.40 = 21.43$$

The merger with Gamma will lower Beta's EPS and raise Beta's price-earnings ratio.

Now let's look at Beta's merger with Delta.

$$EPS = \frac{\$600,000 + \$160,000}{400,000 + 80,000} = \$1.58$$

$$\text{Price-earnings ratio} = 30/1.58 = 19.0$$

The merger with Delta will raise Beta's EPS and lower Beta's price-earnings ratio. Other factors to consider in Beta's analysis of merger possibilities include:

Synergy – Though synergies do not affect Beta's immediate EPS and price-earnings ratio, it is important to consider their effects in the long-term. Synergies are more likely with Delta, as the two firms are in the same industry.

Market Power – can also play a role if Beta is operating in an industry with a small number of firms that could dominate the industry and sometimes push prices up. This factor deserves particular consideration in the analysis of the merger with Delta.

73. An acquiring firm is considering buying Toronto Tailors, Inc (TT). The sales, income statement, capital, and valuation ratios information for TT is provided below. Using this information, you are required to estimate the value of TT's equity:

- using the industry averages for the first five valuation ratios presented below
- using the five-year averages for TT for the first five valuation ratios presented below
- using the forward P/E ratio based on the following assumptions:

8% is a reasonable cost of equity for TT;

TT maintains its present dividend payout ratio; and

TT's earnings and dividends grow at an annual rate of 5 percent indefinitely

CAPITAL: (\$ millions)

Number of common shares
outstanding

0.8

Invested capital (book values):

Equity

8

Debt

8

Market value of equity:

24

$$\text{P/E} \times \text{Net Income} = 15.5 \times \$1.5\text{m} = \$23.25\text{m}$$

$$16.7 \times \text{Payout} \div (k - g) = \$0.5\text{m} \div (0.08 - 0.05) = \$16.7\text{m}$$

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o

Unreviewed

$$V/EBIT \times EBIT - DEBT = (7.33 \times \$3m) - \$8m$$

$$V/EBITDA \times EBITDA - DEBT = (7.24 \times \$3.5m) - \$8m$$

$$P/Sales \times Sales = 2.16 \times \$10m$$

market value of equity

overvalued as it falls on
the upper bound of the

c) Using the forward P/E

Next year's earnings, E_1	\$1.58	Net Income x (1 + growth rate) = \$1.5m x (1.05)
	m	
	\$26.4	P/E x E_1 = 16.7 x \$1.58m
	m	

Thus, based on these calculations, the current market value of equity (\$24m) may be undervalued as our estimate using the forward P/E ratio is \$26.4m.

74. Third Cup is considering purchasing Canadian Tea Inc. (CT). Third Cup, a high-end food and beverage retailer, has been provided with the following information for Canadian Tea, for the next year. Expected values for CT next year:

EBIT	7,440,000
Interest payments	744,000
Depreciation and amortization expense	0
Deferred taxes	372,000
Increase in net working capital	0
Net capital expenditures	186,000
Corporate tax rate	0
	744,000
	0
	558,000
	0
	42%

Third Cup has asked you to conduct the following analysis:

- Estimate Canadian Tea's free cash flow to equity for next year.
- Estimate the total value of Canadian Tea's equity, as well as on a per-share basis. Assume (i) a constant annual growth rate of free cash flow of 4.3% indefinitely, (ii) Canadian Tea's has 650,000 shares outstanding, (iii) the appropriate beta is 1.12, (iv) the expected market return is 9.8 percent, and (v) the risk-free rate is 3.6 percent.

Type: Calculation Difficulty: Medium LO: 15.5

Suggested answer:

a) First, calculate net income for Canadian Tea:

$$\text{Net income} = (7,440,000 - 744,000) \times (1 - 0.42) = \$3,883,680$$

Next, calculate free cash flow to equity:

$$\text{FCF to equity} = \text{net income} + \text{non-cash expenses} - \text{increase in net working capital} - \text{net capital expenditures} = 3,883,680 + 372,000 + 186,000 - 744,000 - 558,000 = \$3,139,680$$

Thus, the free cash flow to equity for Canadian Tea's is \$3,139,680.

b) First, we need to calculate the cost of equity $k = 3.6 + (9.8 - 3.6)(1.12) = 10.54\%$. Since we are assuming cash flows grow at a constant rate indefinitely at 4.3%, the total value of Canadian Tea's equity is:

$$\text{Total equity value} = 3,883,680 \div (0.1054 - 0.043) = \$62,238,461$$

$$\text{On a per-share basis, the equity value is} = 62,238,461 \div 650,000 = \$95.75.$$

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Chapter 16: Leasing**Multiple Choice Questions****Section 16.1 – Leasing Arrangements**

1. Asset-based lending is:

- A. Based on an underlying asset that serves as collateral in the event of default
- B. Financing that is tied directly to a particular asset
- C. A and B
- D. None of the above

Answer: C Type: Definition Difficulty: Easy LO: 16.1

2. Frank owns a large dump truck. Charles offers to pay Frank \$1,500 per month for 36 months' use of the truck. If Frank accepts the offer, then:

- A. Frank is the lessee and Charles is the lessor
- B. Frank is the lessor and Charles is the lessee
- C. Frank and Charles are lessors
- D. Frank and Charles are lessees

Answer: B Type: Definition Difficulty: Easy LO: 16.1

3. The Quebelease Company offers La Presse a lease on a large printing press. The current value of the printing press is \$50,000 and it is expected to have a market value of \$30,000 in 5 years. The annual lease payments are \$8,000 per year for five years. At the end of the lease, La Presse has the right to buy the printing press for \$5,000. This is an example of:

- I. Asset-based financing
- II. A lease that is likely to be considered a conditional sales agreement by the CRA
- III. A sale and leaseback agreement

- A. I only
- B. II only
- C. I and II only
- D. II and III only

Answer: B Type: Definition Difficulty: Easy LO: 16.1

4. In an operating lease, the _____ holds title to the asset.

- A. Lessee
- B. Lessor
- C. Supplier
- D. A or B

Answer: B Type: Definition Difficulty: Easy LO: 16.1

5. The lease that is most like a rental agreement is the:

- A. Capital lease
- B. Financial lease
- C. International lease
- D. Operating lease

Answer: D Type: Definition Difficulty: Easy LO: 16.1

6. Use the following statements to answer this question:

I. Leverage leasing does not provide the same benefits to the lessor in Canada as it does in the US.

II. Amortizing the asset on the lessor's balance sheet is major benefit for financial lease revenue.

A. I and II are correct

B. I and II are incorrect

C. I is correct and II is incorrect

D. I is incorrect and II is correct

Answer: C

Type: Concept

Difficulty: Medium LO: 16.1

7. The Canadian Revenue Agency's definition of financial lease allows:

I. the lessor to benefit from high amortization expense.

II. the lessor to own the asset

III. the lessee to expense payment to the lessor

IV. the lessee to own the asset

Answer: D

Type: Concept

Difficulty: Medium LO: 16.1

8. Before 1989, what was the benefit of the sale and leaseback agreement?

A. A loophole in the tax code.

B. An illegal transfer of costs between lessee and lessor.

C. A mutual benefit between companies in different countries

D. More important in the 1990's.

Answer: A

Type: Concept

Difficulty: Medium LO: 16.1

9. Which of the following is/are true about operating leases?

I. The lessee can usually cancel the lease on relatively short notice.

II. The lessee provides maintenance for the asset.

III. The lessee assumes any risk of obsolescence.

A. I only

B. II and III

C. I and III

D. I and II

Answer: A

Type: Definition

Difficulty: Easy

LO: 16.1

10. Which of the following is true about a sale and leaseback arrangement?

A. The lessee obtains the use of an asset not previously owned.

B. The lessee sells an asset to a financial institution, which then leases the asset back to the lessee.

C. The lessor provides only a portion of the capital needed to purchase the equipment.

D. The lessee is permitted to deduct CCA on the leased assets for income tax purposes.

Answer: B

Type: Definition

Difficulty: Easy

LO: 16.1

11. Which of the following are characteristics of financial or capital leases:

I. The lease term is equal to 75 percent or more of the economic life of the leased property.

II. The present value of the minimum lease payments is equal to 70 percent or more of the fair value of the leased property at the inception of the lease.

III. Provisions are made such that ownership of the leased property is transferred to the lessee at the end of the lease term.

- A. I and II
- B. II and III
- C. I and III
- D. I, II and III

Answer: C

Type: Definition

Difficulty: Medium LO: 16.1

Section 16.2 – Accounting for Leases

12. The residual value is a _____ cash flow, from the point of view of the lessee.

- A. Positive
- B. Negative
- C. non-existent (since the lessee does not own the asset)
- D. positive or negative, depending on the tax rate

Answer: B

Type: Definition

Difficulty: Easy

LO: 16.2

13. All of the following must be included on a company's balance sheet *except*:

- A. Capital leases
- B. Sale and leaseback agreements
- C. Operating leases
- D. Leveraged Leases

Answer: C

Type: Definition

Difficulty: Easy

LO: 16.2

14. Leasing, and its respective effects on the firm, is very similar to _____ financing.

- A. Equity
- B. Debt
- C. Guaranteed
- D. Trade

Answer: B

Type: Concept

Difficulty: Easy

LO: 16.2

15. Use the following statements to answer this question:

I. An increase in the interest rate of the lease would decrease the rental revenue for an operating lease.

II. An increase in interest rates would decrease the value of assets from the financial lease on the lessor's balance sheet.

- A. I and II are correct
- B. I and II are incorrect
- C. I is correct and II is incorrect
- D. I is incorrect and II is correct

Answer: C

Type: Concept

Difficulty: Difficult

LO: 16.2

16. Use the following statements to answer this question:

I. The ownership of the assets dictates who claims the assets on the balance sheet.

II. Lessors are always benefiting from the lease because it decrease their expenses.

- A. I and II are correct
- B. I and II are incorrect

- C. I is correct and II is incorrect
- D. I is incorrect and II is correct

Answer: C Type: Concept Difficulty: Medium LO: 16.2

17. An operating lease compared to a financial lease will result in:
- A. higher net income in the early years and no difference in net income in the later years.
 - B. higher net income in the early years and lower net income in the later years.
 - C. lower net income in the early years and higher net income in the later years.
 - D. no difference as the classification of the lease has no effect on net income.

Answer: B Type: Concept Difficulty: Medium LO: 16.2

18. Compared with an operating lease, a financial lease will have:
- A. lower cash flow from operations (CFO) and higher cash flow from financing (CFF)
 - B. higher CFO and lower CFF
 - C. higher CFO and higher CFF
 - D. the same CFO and CFF

Answer: B Type: Concept Difficulty: Medium LO: 16.2

19. Compared with a financial lease, an operating lease will be associated with:
- A. higher earnings per share
 - B. lower earnings per share
 - C. no difference in earnings per share
 - D. impact on earnings per share cannot be determined as operating leases are off-balance sheet items

Answer: A Type: Concept Difficulty: Medium LO: 16.2

20. Canada Lease Co is considering switching from using operating leases to financial leases. The expected impact on its stock price is:
- A. The price should fall as the earnings per share will decline.
 - B. The price should rise as the earnings per share will rise.
 - C. The price should not change as the total cash flows will not change.
 - D. The price should rise as the cash flow from operations will rise.

Answer: C Type: Concept Difficulty: Difficult LO: 16.2

Section 16.3 – Evaluating the Lease Decision

21. The RonCo Company is considering a recycling project. The project will result in a decrease in their garbage disposal costs. The acquisition cost of the recycling machine is \$100,000. The present value of the depreciation tax shield (CCA) is \$35,000 and the machine is expected to have a zero salvage value. The firm can lease the machine instead of buying it – the present value of the before-tax lease payments is \$60,000 and the present value of the tax savings from the lease payments is \$20,000. Should the firm lease the recycling machine?
- A. Yes, the NPV of leasing is \$60,000.
 - B. Yes, the NPV of leasing is \$25,000.
 - C. No, the NPV of leasing is -\$40,000.
 - D. No, the NPV of leasing is -\$175,000.

Answer: B Type: Calculation Difficulty: Easy LO: 16.3

How answers obtained:

- A. $100 - 60 + 20$
- B. $100 - 35 - 60 + 20$
- C. $-60 + 20$
- D. $-100 - 35 - 60 + 20$

22. You are the CFO of a company. You are considering leasing photocopiers from the manufacturer instead of purchasing them for \$200,000. You can borrow at 9 percent and the corporate tax rate is 35 percent. The lease payment will be \$50,000 each year for 5 years, beginning immediately. At the end of the 5 years, the photocopiers will be worthless. Assume that the photocopiers can be depreciated by \$40,000 per year for 5 years, for tax purposes.

Should the firm lease the photocopiers?

- A. Yes, the IRR of the lease incremental cash flows is greater than the after-tax cost of borrowing
- B. No, the IRR of the lease incremental cash flows is less than the after-tax cost of borrowing
- C. Yes, the IRR of the lease incremental cash flows is less than the after-tax cost of borrowing
- D. No, the IRR of the lease incremental cash flows is greater than the after-tax cost of borrowing

Answer: D

Type: Calculation Difficulty: Medium LO: 16.3

How answer was obtained:

D. Annual cash flows: Year 0: $(200 - 50 \cdot .65) = 167.5$, years 1 to 4: $(-50 \cdot .65 - 40 \cdot .35) = -46.5$; year 5: $-40 \cdot .35 = -14$. IRR of cash flows: $7\% > \text{after-tax cost of debt}(9\% \cdot .65 = 5.85\%)$ Do not take lease.

23. You are the CFO of a company. You are considering leasing photocopiers from the manufacturer instead of purchasing them for \$200,000. You can borrow at 9 percent and the corporate tax rate is 35 percent. The lease payment will be \$50,000 for 5 years, beginning today. At the end of the 5 years, the photocopiers will be worthless. Assume that the photocopiers can be depreciated \$40,000 per year for tax purposes. What is the IRR of the lease incremental cash flows?

- A. 5.85%
- B. 7.00%
- C. 9.00%
- D. 12.03%

Answer: B

Type: Calculation Difficulty: Medium LO: 16.3

How choices were obtained:

A. $9\% \cdot .65 = 5.85\%$

B. Annual cash flows: Year 0: $(200 - 50 \cdot .65) = 167.5$, years 1 to 4: $(-50 \cdot .65 - 40 \cdot .35) = -46.5$; year 5: $-40 \cdot .35 = -14$. IRR of cash flows: 7%

C. 9.00%

D. Annual cash flows: Year 0: $(200 - 50 \cdot .65) = 167.5$, years 1 to 5: $(-50 \cdot .65 - 40 \cdot .35) = -46.5$. IRR of cash flows: 12.03%

24. When deciding whether or not to lease an asset, the _____ should be compared against the _____, and if the first is lower then the company should proceed with the lease.

- A. internal rate of return / after-tax cost of debt
- B. WACC / after-tax cost of debt

C. after-tax cost of debt / internal rate of return

D. return on equity / WACC

Answer: A

Type: Concept

Difficulty: Medium LO: 16.3

25. The MontRec Company is considering a recycling project. The project will result in a decrease in their garbage disposal costs. The acquisition cost of the recycling machine is \$100,000 and the present value of the net garbage disposal cost savings is calculated to be \$25,000. The present value of the depreciation tax shield (CCA) is \$35,000 and the machine is expected to have a zero salvage value. The firm can lease the machine instead of buying it – the present value of the before-tax lease payments is \$60,000 and the present value of the tax savings from the lease payments is \$20,000. Should the firm enter into the recycling project?

A. Yes, the NPV of the project is \$25,000.

B. Yes, the NPV of the project is \$50,000.

C. No, the NPV of the project is -\$40,000.

D. No, the NPV of the project is -\$15,000.

Answer: D

Type: Concept

Difficulty: Difficult LO: 16.3

How choices were obtained:

A. $100 - 35 - 60 + 20$

B. $100 - 35 - 60 + 20 + 25$

C. $\text{NPV}(\text{project}|\text{buying}) = -100 + 35 + 25 = -40$

D. $\text{NPV}(\text{project}|\text{leasing}) = -60 + 20 + (100 - 35 - 60 + 20) = -15$

26. The MontRec Company is considering a recycling project. The project will result in a decrease in their garbage disposal costs. The acquisition cost of the recycling machine is \$100,000 and the present value of the net garbage disposal cost savings is calculated to be \$25,000. The present value of the depreciation tax shield (CCA) is \$35,000 and the machine is expected to have a zero salvage value. The firm can lease the machine instead of buying it – the present value of the before-tax lease payments is \$60,000 and the present value of the tax savings from the lease payments is \$50,000. Should the firm enter into the recycling project?

A. Yes, the NPV of the project is \$15,000.

B. Yes, the NPV of the project is \$55,000.

C. Yes, the NPV of the project is \$80,000.

D. No, the NPV of the project is -\$40,000.

Answer: A

Type: Concept

Difficulty: Difficult LO: 16.3

How choices were obtained:

A. $\text{NPV}(\text{project}|\text{leasing}) = 25 - 60 + 50 = 15$

B. $\text{NPV}(\text{lease}) = 100 - 35 - 60 + 50 = 55$

C. $(100 - 35 - 60 + 50) + 25$

D. $\text{NPV}(\text{project}|\text{buying}) = -100 + 35 + 25 = -40$

27. A company is given the option of entering into a five-year, \$20,000 financial lease arrangement that calls for prepaid monthly payments based on a 5 percent lease rate, the second option would be borrowing \$20,000 through a five-year loan that calls for end of month payments based on a 5.4 percent lending rate. What is the NPV of the lease?

I. \$ 275.11

II. \$ 192.92

III. \$ 186.35

IV. \$ 0

Answer: C

Type: Calculation

Difficulty: Difficult LO: 16.3

How options are determined:

A. Annuity is used instead of annuity due in both estimations

B. Annuity is used instead of annuity due to calculate lease payment

C. $200001 - 1(1 + 5\%/12)^{60} 5\%/12 \times (1 + 5\%/12) = 375.86$; $375.86 \times 1 -$

$1(1 + 5.4\%/12)^{60} 5.4\%/12 \times 1 + 5.4\% = 19813.65$

28. You are the manager of a sales division. You are considering leasing a fleet of cars for your staff. You can buy the cars for \$300,000 or you can lease them for 8 years at \$60,000 per end of year. The company faces a tax rate of 40 percent and a CCA rate of 10 percent on vehicles. If the company buys the cars and finances the purchase with a loan, they will pay 7 percent in interest. Assume that after the term of the lease is over, the salvage value of the cars will be zero. What is the NPV of the lease?

A. \$217,196

B. \$59,610

C. -\$23,194

D. -\$240,390

Answer: C

Type: Calculation

Difficulty: Difficult LO: 16.3

How choices were obtained:

$$\frac{C_0 dT}{d+k} \left(\frac{1+.5k}{1+k} \right) = \frac{300,000 * .1 * .4}{.1 + 0.07 * (1-.4)} \left(\frac{1+.5 * .07 * (1-.4)}{1+.07 * (1-.4)} \right) = \frac{12,000}{0.142} \left(\frac{1.021}{1+.042} \right) = \$82,804$$

PV of after-tax lease payments: $N=8$, $PMT = \$60,000(1-.4)$, $I = 7\% * (1-.4)$. $PV = \$240,390$

NPV of lease = $300,000 - 82,804 - 240,390$

A. $300,000 - 82,804 = \$217,196$

B. $300,000 - 240,390 = \$59,610$

C. $300,000 - 82,804 - 240,390 = -\$23,194$

D. PV of after-tax lease payments

Section 16.4 – Motivation for Leasing

29. Which of the following is *not* a reason for leasing?

A. Leasing provides the lessor with insurance against obsolescence.

B. Leasing can reduce taxable income.

C. Leasing can be a source of off-balance-sheet financing, provided certain conditions are met.

D. A company can obtain financing easier because the leasing company retains title to the asset.

Answer: A Type: Concept Difficulty: Easy LO: 16.4

30. All of the following are reasons for leasing *except*:

- A. Companies with a weak credit rating can obtain financing because the lessor retains title to the asset.
- B. Payments on a lease are variable which removes an additional element of uncertainty.
- C. The terms offered under a lease may be more attractive than those a customer could get under a comparable loan.
- D. Leases provide the lessee with flexibility and insurance against obsolescence.

Answer: B Type: Concept Difficulty: Easy LO: 16.4

31. Use the following statements to answer this question:

- I. Operational leasing lowers the level of debt in your balance sheet.
- II. One of the motivations of leasing is specialization in certain fields.
- A. I and II are correct
- B. I and II are incorrect
- C. I is correct and II is incorrect
- D. I is incorrect and II is correct

Answer: A Type: Concept Difficulty: Medium LO: 16.4

32. Which one of the following can be associated with the cheap financing motivation of leasing?

- A. Interest rates are fixed for the period of the lease.
- B. No maintenance costs.
- C. Reduce risk of holding the asset.
- D. All of the above

Answer: D Type: Concept Difficulty: Medium LO: 16.4

33. The CFO of Alberta Country Record Company has decided to use operating leases because this will result in the firm reporting higher net income and lower debt ratios. He feels this will reduce the cost of debt for the firm thereby increasing the value of the firm. If the market is efficient then his statement

- A. is a valid reason to use operating leases.
- B. is not a valid reason to use operating leases.
- C. is incorrect as operating leases result in firm's reporting lower net income.
- D. is incorrect as lowering the cost of debt will not increase the value of the firm.

Answer: B Type: Concept Difficulty: Medium LO: 16.4

Practice Problems

34. Frank has just started his first business—a snow removal company. In order for his business to be successful, he will need three large industrial strength snow blowers. Each snow blower will cost \$30,000. Provide three advantages leasing offers this small business.

Type: Concept Difficulty: Medium LO: 16.4

Suggested Answers:

Flexibility – the lease may contain the option to cancel the lease (Frank will not be left with trying to sell the three blowers if his business fails) and he may be able to negotiate convenient timing for his lease payments (i.e., payments in winter when he has the cash flow).

Capital Budget – as this is a small firm that is just starting in business, it is unlikely to have sufficient cash (or debt capacity) available to spend \$90,000 on the blowers. Leasing offers a way to acquire these assets.

Cheaper Financing – as the entire lease payment is tax deductible, the overall cost of the lease may be lower than obtaining bank financing.

Implicit interest rates – as Frank's company is small and a start up, he is unlikely to be able to obtain cheap fixed-rate financing. Leasing may offer a way to control the variability in his cost of debt due to the fixed lease payments.

35. What are the two categories of relevant costs that should be weighed against the benefits of leasing?

Type: Concept Difficulty: Medium LO: 16.2

Suggested answer:

Direct cash outflows associated with the lease contract, i.e., the after-tax lease payments.

Indirect or opportunity costs that result from the fact that ownership of the asset is not retained, i.e., the CCA tax shield and asset's salvage value.

36. How should a CFO decide between leasing and debt financing? What criteria should she use?

Type: Concept Difficulty: Medium LO: 16.2

Suggested answer:

She can use two methods:

1. If the NPV of leasing is positive using the cost of debt, then she should go ahead with the lease. If not, then she should go with debt financing.

2. Set the NPV of the leasing formula to zero, then solve for the IRR using trial and error. If the IRR is less than the cost of debt, she should go ahead with the lease. Otherwise she should take the debt financing.

37. What is the impact of shifting the purchase of equipment to operating leases?

Type: Concept Difficulty: Medium LO: 16.2

Suggested answer:

Adopting a strategy of contracting operating leases instead of purchasing equipment has two effects on financial statements: First it means that the financing is not required anymore, which implies a decrease in the level of borrowing which means that liabilities would decrease, which is synonymous to a decrease in assets since the equipment is not owned by the company; second is in terms of income statement: instead of expensing the CCA related to the firm, rental expenses are also expensed.

38. What are the possible limitations to the idea that the value of the firm is immune to leasing?

Type: Concept Difficulty: Medium LO: 16.4

Suggested answer:

The value of the firm depends on discounted cash flows. The fact that leasing may alter the cost of financing may have an effect on the value of the firm. However, leasing by itself does not

change the value of the firm because it is just a change in the reporting of information by the firm and not a change in its risk profile.

39. You are a bank manager and are evaluating the financial statements of one of your corporate clients. What do you have to be aware of in terms of the client's leasing arrangements so that you correctly analyze the financial statements?

Type: Concept Difficulty: Medium LO: 16.2

Suggested answer:

If the company has operating leases that are off-balance-sheet, then the manager will need to ask for details on these leases in order to determine the firm's leverage. If the manager evaluates the firm without considering operating leases, then the analysis will understate the true amount of debt.

40. Your company requires a new truck to expand its delivery range. The cost of this truck is \$38,000. The life of this asset should be 6 years with a \$5,500 salvage value. Inquiries to a few banks have shown that a loan for the full amount is available with a yearly interest payment of 14%. Another option is to add this asset to the lease you already have. The leasing company has told you it will purchase the truck and lease it to you for an initial payment of \$8,300 and an annual payment of \$8,300 payment at the end of each of the next 6 years (a total of 7 payments). The company's tax rate is 38%, and the CCA rate of the asset pool of the truck is 20%.

a) Will you proceed with the lease or buy the asset?

b) What will the salvage value have to be before you change your decision?

Type: Calculation Difficulty: Difficult LO: 16.2

Suggested answer

a) $NPV_{\text{lease}} =$ + original purchase price of asset
 – present value of future after-tax lease payments
 – present value of tax shield from CCA lost due to leasing

$$- \left[\frac{\$8,300 \times (1 - 0.38)}{0.0868} \left(1 - \frac{1}{1.0868^6} \right) + \$8,300 \times (1 - 0.38) \right]$$

$$- \frac{\$5,500}{1.0868^6} + \frac{\$5,500 \times 0.2 \times 0.38}{0.2 + 0.0868} \left(\frac{1 + 0.5 \times 0.0868}{1.0868} \right) + \left(\frac{\$5,500 \times 0.2 \times 0.38}{0.2 + 0.0868} \right) \left(\frac{1}{1.0868^6} \right)$$

$$NPV_{\text{lease}} = \$38,000 - \$28,452.45 - \$9,667.61 + \$884.50 - \$3,337.84 = -\$2,573.40 < 0$$

Therefore, purchase the truck.

$$S \left(\frac{0.2 \times 0.38}{0.2 + 0.0868} \times \frac{1}{1.0868^6} - \frac{1}{1.0868^6} \right)$$

$$= \$38,000 - \$28,452.45 - \$9,667.61 +$$

$$S = -\$269.16$$

The salvage value would have to decrease from \$5,500 to $-\$269.16$ in order to make leasing the truck more attractive than purchasing. This means from the lessee's point of view, leasing only becoming viable if it costs at least \$269.16 to dispose of the asset, under the purchase option.

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Chapter 17: Investment Banking and Securities Law**Multiple Choice Questions****Section 17.1 – Conflicts between Issuers and Investors**

1. Asymmetric information is **best** defined as:

- A. Information that is available to both parties in a deal and which can be exploited equally by each.
- B. Information that is available to neither party in a deal.
- C. Information that is available to one party in a deal but is not available to the other.
- D. Any information provided by insiders of the firm.

Answer: C Type: Definition Difficulty: Easy LO: 17.1

2. Which of the following cases is **not** an example of asymmetric information?

- A. Gus buys a used car from Artie's Ambiguous Autos Inc., not knowing it is a lemon.
- B. Gus buys a used car from Artie's Ambiguous Autos Inc., knowing it is a lemon.
- C. Gus, a small retail investor, purchases shares in Artie's Ambiguous Autos Inc.
- D. Gus, a mutual fund manager, purchases shares in Artie's Ambiguous Autos Inc.

Answer: B Type: Concept Difficulty: Easy LO: 17.1

3. Use the following statements to answer this question:

- I. Asymmetric information is **not supposed** to exist in efficient markets.
 - II. Investors protect themselves from asymmetry of information by asking for high premiums
- A. I and II are correct
 - B. I and II are incorrect
 - C. I is correct and II is incorrect
 - D. I is incorrect and II is correct

Answer: C Type: Concept Difficulty: Medium LO: 17.1

4. When does a “financing gap” occur?

- A. When a firm raises capital in the market by **selling unequal** amounts of bonds and equity, and the gap is the difference between the two amounts.
- B. When firms are unable to find investors to purchase their securities.
- C. When there is a period of time occurring between **cash outflows** from a project and the cash inflows from the project financing.
- D. Each of the above is an example of a financing gap.

Answer: B Type: Definition Difficulty: Easy LO: 17.1

5. To which of the following does Gresham's Law apply?

- A. The used car market
- B. Counterfeit money in circulation
- C. Capital markets
- D. Gresham's Law is applicable to all of the above.

Answer: D Type: Concept Difficulty: Easy LO: 17.1

6. When interest payments are made by mailing a cheque to the officially listed owner, the bonds must have been issued in _____ form.

- A. registered
- B. consolidated
- C. bearer
- D. booked

Answer: A Type: Definition Difficulty: Easy LO: 17.1

7. Which one of the following is an example of fraudulent activities?

- A. Selling penny stocks to investors
- B. Using an accounting method that increases the earnings of the firm
- C. Buying a large part of a new company and then selling it when the price increases
- D. Spreading false rumours about a possible merger.

Answer: D Type: Concept Difficulty: Easy LO: 17.1

8. Sal Bender, not one of the most upstanding citizens, has just been arrested for financial fraud, after he cooked up a get-rich-quick scheme which enticed people to purchase \$10 million worth of his interest-bearing bonds. He had promised the investors quarterly coupon payments of \$50 each, and that he would return the face value of \$1,000 at maturity in five years. The current market interest rate is 7%. His scheme was successful initially, but within four months, it blew up in his face when the police came for him at his beach house in Barbados. Based on your knowledge of bonds, what was the biggest flaw in Sal's scheme?

- A. Offering such a high yield to maturity compared to the current market rate tipped off the authorities.
- B. Making quarterly payments instead of semi-annual payments increased the up-front costs.
- C. Using interest-bearing instead of zero-coupon bonds required him to make coupon payments.
- D. There was no flaw in Sal's plan – he was just unlucky and got caught.

Answer: C Type: Concept Difficulty: Medium LO: 17.1

9. The attractiveness of a Ponzi pyramid scheme consists of:

- A. selling stocks with very high volatility to investors,
- B. convincing investors to invest in assets from which they will never receive a return,
- C. attracting investors by giving them a high return using new subscribers money,
- D. convincing investors to invest and then declaring bankruptcy,

Answer: C Type: Concept Difficulty: Medium LO: 17.1

10. Suppose that the current market interest rate is 12% for non-fraudulent bonds, and that one in six bonds are fraudulent in a given market. What would the interest rate be if a fraud premium is introduced, assuming (1) a one-year investment horizon and (2) the market does not require a risk premium?

- A. 68.0%
- B. 40.0%
- C. 34.4%
- D. 10.0%

Answer: C Type: Calculation Difficulty: Medium LO: 17.1

How each option was obtained:

- A. $4 * (1 + k) = 6 * (\$1.12) \rightarrow 4 * (1 + k) = 6.72 \rightarrow k = 68.0\%$
- B. $4 * (1 + k) = 5 * (\$1.12) \rightarrow 4 * (1 + k) = 5.60 \rightarrow k = 40.0\%$

C. $5 * (1 + k) = 6 * (\$1.12) \rightarrow 5 * (1 + k) = 6.72 \rightarrow k = 34.4\%$

D. $5/6 * (12\%) + 1/6 * (0\%) = 10\%$

11. Which of the following potentially result from investors losing faith in the capital market?

- A. Increased off-shore investing
- B. Increased investing in real assets like houses and gold
- C. The complete collapse of public capital markets
- D. All of these are potential consequences of the loss of investor faith in the capital market.

Answer: D Type: Concept Difficulty: Easy LO: 17.1

12. Which of the following is not a mechanism designed to maintain investor confidence in capital markets?

- A. Corporate law
- B. Securities legislation
- C. Due diligence
- D. Due process

Answer: D Type: Concept Difficulty: Easy LO: 17.1

13. Which of the following is a fraudulent activity?

- I. Selling stocks on an institution where there is zero external activity.
- II. Selling penny stocks as blue chip stocks

- A. I and II are fraudulent
- B. I and II are not fraudulent.
- C. I is fraudulent and II is not fraudulent
- D. I is not fraudulent and II is fraudulent

Answer: A Type: Concept Difficulty: Medium LO: 17.1

Section 17.2 – A Primer on Securities Legislation in Canada

14. What does the acronym SEC stand for in regards to the financial system?

- A. Security Exchange of Canada
- B. Securities and Exchange Commission
- C. Security Enforcement Coalition
- D. None of the above.

Answer: B Type: Definition Difficulty: Easy LO: 17.2

15. Which of the following is **not** one of the major factors the OSC uses to determine whether or not a document is really a security?

- A. Whether the promoter raises money and leads the investor to expect a profit.
- B. Whether there is risk involved.
- C. Whether the investor has any control over how the money is spent.
- D. Whether the investor is led to expect any additional pecuniary benefits.

Answer: D Type: Concept Difficulty: Easy LO: 17.2

16. Why is there a resistance to implementing a federal regulator in Canada?

- A. The federal government is reluctant to intervene in the financial marketplace.
- B. The provincial governments are earning proceeds from having control.

- C. Some provinces will have to give up control.
- D. Federal laws prohibit the federal government from intervening in securities regulation.

Answer: C Type: Concept Difficulty: Medium LO: 17.2

17. Which of the following is/are the major areas in which the OSC is involved?

- A. Primary and secondary market offerings
- B. Activities of investment professionals
- C. Takeover bids
- D. All of the above areas.

Answer: D Type: Concept Difficulty: Easy LO: 17.2

18. Which of the following is **not** an essential part of a prospectus?

- A. Auditor's statements
- B. A letter from the president giving broad facts about the company
- C. Details of future equity issues
- D. Compensation to be received by company directors and senior executives

Answer: C Type: Concept Difficulty: Medium LO: 17.3

19. Use the following statements to answer this question:

I. Risk of information asymmetry is high in an IPO because the company's public disclosure, as a public firm, is minimal.

II. An IPO prospectus eradicates the issue of information asymmetry completely.

- A. I and II are correct
- B. I and II are incorrect
- C. I is correct and II is incorrect
- D. I is incorrect and II is correct

Answer: C Type: Concept Difficulty: Medium LO: 17.3

20. The acronym IPO stands for:

- A. Initial Public Offering
- B. Investment Public Offering
- C. Intrinsic Put Option
- D. Initial Private Offering

Answer: A Type: Definition Difficulty: Easy LO: 17.3

21. Which of the following is **not** true about a prospectus?

- A. The investment dealer helps in the preparation of the document but is not legally liable.
- B. The CFO signs the document on behalf of the board of directors.
- C. All parties involved in the process are supposed to do their best to insure the consistency of the information provided.
- D. It should be a detailed and honest disclosure of the information about the firm.

Answer: A Type: Concept Difficulty: Medium LO: 17.3

22. If you are handed a formal summary of a security that describes the costs, investment objectives, and risks involved, what are you reading?

- A. Annual report

- B. Prospectus
- C. Auditor report
- D. Proxy statement

Answer: B Type: Definition Difficulty: Medium LO: 17.3

23. If you are reading an IPO prospectus, in which form must it be?

- A. Short-form prospectus, due to the company's shorter history.
- B. Long-form prospectus, due to the greater risk.
- C. Either short- or long-form, as long as a prospectus is filed
- D. A prospectus is not required for an IPO.

Answer: B Type: Definition Difficulty: Medium LO: 17.3

24. What is the exempt market?

- A. The regulated market for non-registered securities that raises money from private investors.
- B. The unregulated market for registered securities that raises money from private investors.
- C. The regulated market for registered securities that raises money from public investors.
- D. The unregulated market for non-registered securities that raises money from private investors.

Answer: D Type: Definition Difficulty: Medium LO: 17.2

25. A prospectus is mandatory for all securities issuances except:

- A. Securities targeting the general public
- B. Corporate bonds issuances
- C. If a very small amount of money is being raised
- D. Sale of a control block

Answer: C Type: Concept Difficulty: Easy LO: 17.3

26. What are the main differences between a prospectus and an offering memorandum?

- A. A prospectus is shorter and costs less to prepare than an offering memorandum.
- B. Offering memorandums are shorter and cost less to prepare than prospectuses.
- C. A prospectus costs less to prepare but is longer than an offering memorandum.
- D. Prospectus and offering memorandum are two different names for the same document.

Answer: B Type: Definition Difficulty: Medium LO: 17.3

27. Use the following statements to answer this question:

- I. Improvements in securities laws have helped in curbing fraudulent activities.
 - II. Asymmetry of information is the major source of frauds in financial markets.
- A. I and II are correct
 - B. I and II are incorrect
 - C. I is correct and II is incorrect
 - D. I is incorrect and II is correct

Answer: A Type: Concept Difficulty: Easy LO: 17.2

28. Which of the following is **not** one of the bases of the three major categories of exempt purchasers?

- A. Sophistication level of the purchaser
- B. Low-risk nature of the instrument

- C. Dollar value of the potential purchase
- D. Existence of alternative regulatory protection

Answer: C Type: Definition Difficulty: Medium LO: 17.2

29. Which of the following is **not** one of the three types of distributions as determined by the Ontario Securities Commission (OSC)?

- A. Distribution by issuer
- B. Distribution selling restricted shares to the public for the first time
- C. Distribution being sold by a control block
- D. Distribution selling unrestricted shares to the public for the first time

Answer: D Type: Definition Difficulty: Medium LO: 17.2

Section 17.3 – IPOs and Investment Banking

30. Which of the following is **not** a reason for a firm to go public?

- A. Founders who are no longer actively involved in the company can cash out.
- B. Increased access to financing options.
- C. Decreased reporting regulations for public companies.
- D. Greater access to larger markets.

Answer: C Type: Concept Difficulty: Easy LO: 17.4

31. Use the following statements to answer this question:

I. One of the most frequently cited reasons of why a firm goes public is because investors want to “cash out”.

II. Obtaining cheaper sources of financing over the long term is a potential reason for an IPO.

- A. I and II are correct
- B. I and II are incorrect
- C. I is correct and II is incorrect
- D. I is incorrect and II is correct

Answer: A Type: Definition Difficulty: Easy LO: 17.4

32. What is venture capital?

- A. Money raised from private investors in the exempt market.
- B. Money raised from public investors in the capital market.
- C. Money raised from private investors in the over-the-counter market.
- D. All of the above are examples of venture capital.

Answer: A Type: Definition Difficulty: Easy LO: 17.4

33. The term “red herring” refers to the:

- A. Underwriting agreement
- B. Preliminary prospectus
- C. Bought deal
- D. IPO

Answer: B Type: Definition Difficulty: Easy LO: 17.4

34. Put the following IPO process stages into chronological order:

- I. Initial filing

- II. Preliminary prospectus
- III. Pricing and distribution
- IV. Investment bank discussion

- A. I, II, III, IV
- B. IV, II, I, III
- C. I, IV, II, III
- D. IV, I, II, III

Answer: B Type: Concept Difficulty: Medium LO: 17.4

35. A high-quality issuer wishing to reduce issuing expenses may choose to have their new issue made on a(n) _____ basis.

- A. escrow
- B. best efforts
- C. letter
- D. bought deal

Answer: B Type: Concept Difficulty: Medium LO: 17.4

36. Which of the following is **not** one of the four main types of public offerings?

- A. Bought deal
- B. Standby offering
- C. Best efforts offering
- D. Greenshoe offering

Answer: D Type: Definition Difficulty: Easy LO: 17.4

37. Which of the following offering types can only be used with seasoned offerings?

- I. Bought deal
- II. Best efforts
- III. Firm commitment
- IV. Standby offering

- A. I and IV
- B. II and IV
- C. II and III
- D. I and II

Answer: A Type: Concept Difficulty: Medium LO: 17.4

38. In a _____ offering, common shares are offered at a discount to investors who already own shares.

- A. Bought deal
- B. Firm commitment
- C. Standby or rights
- D. Best efforts

Answer: C Type: Definition Difficulty: Easy LO: 17.4

39. What is the spread for an investment dealer who purchases shares for a fixed price of \$13 each and resells them to the public at a price of \$15 each?

- A. \$2

- B. \$15
- C. \$28
- D. The spread can only be determined when the number of shares both purchased and sold is known.

Answer: A Type: Calculation Difficulty: Medium LO: 17.4

How options were obtained:

- A. $\$15 - \$13 = \$3$
- B. resale price
- C. $\$15 + \$13 = \$28$

40. How is the compensation to a Canadian investment dealer determined?

- A. A standard 2% underwriting fee (based on gross proceeds) plus the total value of the spread.
- B. A standard 4% underwriting fee (based on gross proceeds) plus the total value of the spread
- C. A standard 2% underwriting fee (based on net proceeds) plus the total value of the spread
- D. A standard 2% underwriting fee (based on gross proceeds)

Answer: B Type: Concept Difficulty: Medium LO: 17.4

41. Montreal Dealers Inc. (MD), a Canadian underwriting firm, has just underwritten an issue by PublicDomaine.com, and the total proceeds of the issue are \$15 million. MD bought the 1,000,000 shares from PublicDomaine for \$13 and sold them to the public for \$15 each. What is the total compensation PublicDomaine must pay to MD?

- A. \$2.6 million
- B. \$0.6 million
- C. \$2 million
- D. \$2.52 million

Answer: A Type: Calculation Difficulty: Medium LO: 17.4

How options were obtained:

- A. $(15,000,000 \times 0.04) + [(15 - 13) \times 1,000,000] = \$2.6 \text{ million}$
- B. $15,000,000 \times 0.04 = \$0.6 \text{ million}$
- C. $(15 - 13) \times 1,000,000 = \$2 \text{ million}$
- D. $(13,000,000 \times 0.04) + [(15 - 13) \times 1,000,000] = \$2.52 \text{ million}$

42. Concordia Partners (CP) has recently underwritten a firm commitment public offering from Laurentide Resort Inc. (LR). However, after three customers died and many others were seriously injured while using LR products, large lawsuits have been raised against the firm, and the demand for LR shares has dwindled to nothing. Which of the following provisions might save CP from having to market an unprofitable issue?

- A. Greenshoe provision
- B. Market out clause
- C. Unforeseen events provision
- D. As it was a firm commitment offering, CP must absorb any losses from underwriting the issue.

Answer: B Type: Concept Difficulty: Medium LO: 17.4

43. The overallotment or greenshoe option allows:

- A. the issuing firm to take back any unsold shares from the underwriter so that an underwriting fee need not be paid for these shares
- B. the underwriting firm to charge a higher price for the shares in cases of very high demand
- C. the underwriting firm to buy more shares from the issuing firm if investor demand is strong
- D. the founder of the firm to sell his or her shares at a higher issue price in the case of strong investor demand

Answer: C Type: Definition Difficulty: Easy LO: 17.4

44. Which of the following is **not** one of the differences between limit and market orders?

- A. Limit orders define the price at which the shares will be purchased while market orders are independent of the final price.
- B. Limit orders are usually made by major institutions while retail investors make market orders.
- C. The amount of shares that can be purchased with a limit order is pre-specified by the underwriter, while market orders can be for any number of shares.
- D. Limit orders are expressions of interest while market orders are for fixed amounts.

Answer: C Type: Definition Difficulty: Easy LO: 17.4

45. Which of the following is not a function of the lead underwriter in supporting the stock during the distribution period?

- A. Trading against other members of the underwriting syndicate.
- B. Using the overallotment option.
- C. Putting as many shares as possible in friendly hands to be able to materialize the sell.
- D. Avoiding the use of the “out clause” as much as possible.

Answer: A Type: Concept Difficulty: Medium LO: 17.4

46. Which of the following activities is allowed during the quiet period?

- A. Hype the stock to help sell it.
- B. Issuing an analyst report recommending the shares.
- C. Reducing the price.
- D. Trading in the shares by the lead underwriter.

Answer: D Type: Concept Difficulty: Easy LO: 17.4

47. Which of the following statements is **not** true about underpricing?

- A. It “leaves money on the table.”
- B. It is done to get more IPO proceeds for the issuing firm.
- C. It is calculated as the difference between the initial offering price and the price on the first day of trading.
- D. It involves pricing an IPO at less than its market value.

Answer: B Type: Concept Difficulty: Medium LO: 17.4

48. Use the following statements to answer this question:

- I. “Leaving money on the table” refers to the underperformance of stocks in the long term.
- II. Underpricing in the US is higher than in Canada

- A. I and II are correct
- B. I and II are incorrect
- C. I is correct and II is incorrect

D. I is incorrect and II is correct

Answer: D Type: Concept Difficulty: Medium LO: 17.4

49. Which of the following is **not** one of the reasons that have been advanced for the high level of underpricing in the U.S.?

- A. Too much competition
- B. The threat of litigation
- C. Lowering the risk for the underwriter
- D. IPO spinning

Answer: A Type: Concept Difficulty: Medium LO: 17.4

50. Use the following statements to answer this question:

- I. Spinning encourages underpricing in the market.
- II. Spinning is unethical.

- A. I and II are correct
- B. I and II are incorrect
- C. I is correct and II is incorrect
- D. I is incorrect and II is correct

Answer: A Type: Concept Difficulty: Easy LO: 17.4

Section 17.4 – Post-IPO Regulation and Seasoned Offerings

51. The filing of quarterly and annual financial statements, annual information forms, and proxy and information circulars is a main component of which of the following:

- A. Continuous disclosure
- B. Due diligence
- C. Fair disclosure
- D. Standard reporting for all public and private companies

Answer: A Type: Definition Difficulty: Medium LO: 17.5

Practice Problems

52. Identify and describe the two ways a new issue of securities can be distributed by the underwriter.

Type: Concept Difficulty: Hard LO: 17.3

Suggested answer:

New securities can be distributed on either a bought deal or best efforts basis.

A bought deal means the investment dealer purchases the entire issue. The purchase takes place at a set price on a particular date, and the risk of the new issue's success is borne by the investment dealer. The dealer meanwhile arranges to retail the securities to investors at a slightly higher price than was paid to the issuing corporation.

A best efforts basis for distribution involves the investment dealer undertaking to do little more than attempt to retail the securities for the issuer, receiving a commission on the sales made. The risk of the success of the new issue remains with the issuing corporation.

53. Identify two types of firms that may have their newly issued securities distributed on a best efforts basis, and discuss why this basis would be used.

Type: Concept Difficulty: Hard LO: 17.4

Suggested answer:

1. Small and speculative issues involving relatively high risks will likely be distributed on a best efforts basis, since investment dealers may not be willing to purchase the issue and thereby assume the risk of the new issue's success.
2. A high-quality issuer may distribute a new security issue on a best efforts basis, in an attempt to reduce issuing expenses.

54. Explain the importance of the lock up period in the asymmetry of information minimization process.

Type: Concept Difficulty: Medium LO: 17.4

Suggested answer:

One of the reasons for IPOs is the willingness of former owners to cash out and sell their shares of the company. Given the fact that owners are more familiar with the firm than new investors, there is a potential abuse of this position. Keeping the owners around for a period of time after the IPO ensures the honesty of the owners; hence, the lockup period reduces the possibility of fraud in the security selling process.

55. Discuss the differences between a letter of intent from the underwriter to the issuer and an underwriting agreement.

Type: Concept Difficulty: Hard LO: 17.4

Suggested answer:

The letter of intent is an informal agreement between the issuer and the underwriter. The letter broadly describes the securities involved, the size of the offering, etc. Any pricing, if mentioned, is given in a range and is not given specifically. This letter of intent is drawn up prior to the underwriter assuming any responsibility, including beginning legal documentation in compliance with provincial securities laws.

The underwriting agreement is a contract between the company and its underwriters. It sets out the various underwriting terms and conditions, including the price at which the principal underwriter buys the issue. It is finalized after the preliminary prospectus has been cleared.

56. Distinguish between the following: public offering, private placement, and rights offering.

Type: Definition Difficulty: Medium LO: 17.4

Suggested answer:

In a public offering, new securities are made available for sale to the general public. These include seasoned new issues and initial public offerings.

Private placements are the opposite of public offerings. Private placements are securities that are purchased in their entirety by one or more financial institutions. The terms and price of the offering are determined through private negotiations.

Rights offerings are when the firm's current shareholders are given the right to subscribe to a new issue of securities at a specified subscription price.

57. Discuss some challenges with initial public offerings (IPOs).

Type: Concept Difficulty: Medium LO: 17.4

Suggested answer:

Establishing the price at which IPO shares will be issued has been challenging to firms and underwriters alike. In the past, IPOs have tended to be underpriced on average; however, a

number have also been overpriced. In addition, the subsequent performance of many IPOs has not been impressive.

58. Describe a potential conflict of interest that may arise when an investment dealer underwrites a new equity issue on a bought deal basis.

Type: Concept

Difficulty: Hard

LO: 17.4

Suggested answer:

When an investment dealer makes a firm commitment to the issuing corporation, the investment dealer agrees to purchase the entire new issue at a set price. The dealer then arranges to retail the securities to investors at a somewhat higher price than was paid to the issuer, with the spread providing compensation for the dealer's services.

The potential conflict that may arise concerns the fact that the investment dealer also provides advice for a fee to the customers buying the new issue from the dealer, and the dealer has an incentive to "get rid of" the new issue. This conflict can make their "advice" in the transaction somewhat suspect.

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Chapter 18: Debt Instruments

Section 18.1 What Is Debt?

1. Which of the following has the characteristics of a fixed contractual commitment?

- A. Long-term debt
- B. Common stock dividends
- C. Preferred stock
- D. Retained Earnings

Answer: A Type: Definition Difficulty: Easy LO: 18.1

2. Which of the following represents tax deductible expenses?

- I. Rental on office building
- II. Interest expense
- III. Preferred stock dividends
- IV. Common stock dividends

- A. I and II
- B. I, II and III
- C. III only
- D. III and IV

Answer: A Type: Definition Difficulty: Easy LO: 18.1

3. Toronto Skaters has issued \$100 million in bonds paying 6% interest per year. The firm has a tax rate of 45%. The firm's annual interest payments are _____ and the after-tax cost of the debt is _____ per year.

- A. \$6 million, \$6 million
- B. \$6 million, \$2.7 million
- C. \$6 million, \$3.3 million
- D. \$3.3 million, \$2.7 million

Answer: C Type: Calculation Difficulty: Easy LO: 18.1

4. Laurentide Ski Resort has to make a choice between two different debt issues. Issue 1 has an interest rate of 5% and the interest is tax deductible. Issue 2 has an interest rate of 4% but the interest is not tax deductible. If the firm has a tax rate of 40%, which issue is preferred and why?

- A. Issue 2 because the interest rate of 4% is less than the 5% of issue 1.
- B. Issue 1 because the after-tax cost is 3% while the after-tax cost of issue 2 is 4%
- C. Issue 1 because the after-tax cost is 2% while the after-tax cost of issue 2 is 4%
- D. Issue 2 because the after-tax cost is 1.6% while the after-tax cost of Issue 1 is 2%

Answer: B Type: Calculation Difficulty: Easy LO: 18.1

5. Use the following statements to answer this question:

- I. Tax deductibility of interest expenses make debt instruments very desirable
- II. An instrument can be classified as debt even if it is not so in the Tax Income Act.

- A. I and II are correct
- B. I and II are incorrect
- C. I is incorrect and II is correct
- D. I is correct and II is incorrect

Answer: D Type: Concept Difficulty: Easy LO: 18.1

Section 18.2: Short-Term Debt and the Money Market

6. Generally, any debt instrument with a maturity of less than one year is called a _____, from one to seven years is called a _____, and more than seven years is called a _____.

- A. Bond, Bill, Note
- B. Bill, Bond, Note
- C. Note, Bill, Bond
- D. Bill, Note, Bond

Answer: D Type: Definition Difficulty: Easy LO: 18.2

7. A treasury bill (T-bill) is a _____ issued by _____.

- A. Short-term promissory note, high quality Canadian firms
- B. Bond, high quality Canadian firms
- C. Short-term promissory note, a government treasury department
- D. Bond, the government of Canada

Answer: C Type: Definition Difficulty: Easy LO: 18.2

8. T-bill yields are quoted on a _____ basis.

- A. Compound interest
- B. After-tax
- C. Discount
- D. None of the above

Answer: C Type: Definition Difficulty: Medium LO: 18.2

9. A Government of Canada T-bill with a face value of \$1,000 and 45 days to maturity is trading for \$985.22. The 45-day interest rate is _____ and the annual rate is _____.

- A. 1.5%, 12.17%
- B. 12.17%, 1.5%
- C. 1.5%, 12.84%
- D. 12.84%, 1.5%

Answer: A Type: Calculation Difficulty: Easy LO: 18.2

$$\$985.22 = \$1,000 / (1 + K)^{365/45}, \quad K = 1.5\%$$

A. 45-day interest rate:

$$= (1 + .015)^{365/45} - 1 = 12.84\%$$

C. Annual rate:

10. Saskatchewan Wheat Fields Inc.'s (SWF) commercial paper with 30 days to maturity has a quoted rate of 8%. There is a 3% probability that the firm will default on the issue and the investor will not receive any money. The T-bill rate is 5%. The yield spread between the T-Bill and the SWF commercial paper is:

- A. 5%

- B. 3%
- C. 2.76%
- D. 2%

Answer: B Type: Definition Difficulty: Easy LO: 18.2

How options were determined:

- A. $8\% - 3\% = 5\%$
- B. $8\% - 5\% = 3\%$
- C. $(.97 \times 8\% + .03 \times 0) - 5\% = 7.76\% - 5\% = 2.76\%$
- D. $5\% - 3\% = 2\%$

11. Laurentide Resorts is issuing a commercial paper with 60 days to maturity. In case of default, the investor will lose the total amount. The quoted rate for the issue is 7 percent, and an equivalent government backed security's rate is 6 percent. What is the probability of default?

- A. 0%
- B. 0.94%
- C. 1%
- D. 99.06%

Answer: B Type: Calculation Difficulty: Medium LO: 18.2

How the options are determined:

B. $1 - 1 + 6\% / 1 + 7\% = 0.94\%$

C. $7\% - 6\% = 1.00\%$

D. $1 + 6\% / 1 + 7\% = 99.06\%$

12. Laurentide Resorts is issuing a commercial paper with 60 days to maturity. In case of default, the investor will receive 40 cents on the dollar. The quoted rate for the issue is 7 percent, and an equivalent government backed security's rate is 6 percent. What is the probability of default?

- A. 0%
- B. 0.94%
- C. 1%
- D. 1.49%

Answer: D Type: Calculation Difficulty: Difficult LO: 18.2

How the options are determined:

B. $1 - 1 + 6\%1 + 7\% = 0.94\%$

$$1000 = \frac{1000(1.07)P + 400(1 - P)}{1.06}; P = 0.9850746 \text{ and } (1 - P) = 0.0149253$$

D.

13. Saskatchewan Wheat Fields Inc. is planning to issue \$100 million of commercial paper with 30 days to maturity. The quoted rate for the issue is 8%. There is a 3% probability that the firm will default on the issue and the investor will receive zero. If the investor's required rate of return is 5%, then the value of the issue is:

- A. \$100 million
- B. \$99.77 million
- C. \$99.59 million
- D. \$97.24 million

Answer: D Type: Calculation Difficulty: Medium LO: 18.2

How the options were determined:

$$\frac{\$100\text{million} * (1 + .08) * .97 + 0}{1 + .05} = \$99.77 \text{ million}$$

$$\frac{\$100\text{million}}{1 + .05/12} = \$99.59 \text{ million}$$

$$\frac{\$100\text{million} * (1 + .08/12) * .97 + 0}{1 + .05/12} = \$97.24 \text{ million}$$

D

14. Saskatchewan Wheat Fields Inc. is planning to issue \$100 million of commercial paper with 30 days to maturity. There is a 3% probability that the firm will default on the issue and the investor will receive zero. The investor's required rate of return is 5%. If the firm wishes to issue the commercial paper at par, the promised yield must be:

- A. 3.52%
- B. 5%
- C. 8.25%
- D. 42.27%

Answer: D Type: Calculation Difficulty: Medium LO: 18.2

$$\left(\frac{1 + \frac{.05}{12}}{.97} \right) - 1 = 3.52\%$$

A.

$$1.05 / .97 - 1 = 8.25\%$$

$$\left[\left(\frac{1 + \frac{.05}{12}}{.97} \right) - 1 \right] * 12 = 42.27\%$$

D.

15. Saskatchewan Wheat Fields Inc. is planning to issue \$100 million of commercial paper with 30 days to maturity. There is a 3% probability that the firm will default on the issue and the investor will receive \$40 million (or 40 cents on the dollar). The investor's required rate of return is 5%. If the firm wishes to issue the commercial paper at par, the promised yield must be:

- A. 2.29%
- B. 7.01%
- C. 27.42%
- D. 42.27%

Answer: C

Type: Calculation Difficulty: Difficult LO: 18.2

$$\frac{\$100\text{million} * (1 + R) * .97 + \$40\text{million} * .03}{1 + \frac{.05}{12}} = \$100 \text{ million}, \quad R = 2.29\%$$

$$\frac{\$100\text{million} * (1 + R) * .97 + \$40\text{million} * .03}{1 + .05} = \$100 \text{ million}, \quad R = 7.01\%$$

$$\frac{\$100\text{million} * \left(1 + \frac{R}{12}\right) * .97 + \$40\text{million} * .03}{1 + \frac{.05}{12}} = \$100 \text{ million}, \quad R = 27.42\%$$

$$\frac{\$100\text{million} * \left(1 + \frac{R}{12}\right) * .97}{1 + \frac{.05}{12}} = \$100 \text{ million}, \quad R = 42.27\%$$

D.

16. Bond rating services:

- A. Evaluate credit or default risk.
- B. Can affect bond prices by the ratings they give.
- C. Classify Government of Canada bonds as nearly default risk free.

D. All of the above

Answer: D Type: Definition Difficulty: Easy LO: 18.2

17. The promised yield on bankers' acceptances is typically _____ than the promised yield on the commercial paper of similar firms because _____.

- A. Higher; banks charge a fee to accept or guarantee the debt
- B. Lower; banks charge a fee to accept or guarantee the debt
- C. Higher; the banks that guarantee the debt are more credit worthy than the issuing firm
- D. Lower; the banks that guarantee the debt are more credit worthy than the issuing firm

Answer: D Type: Concept Difficulty: Medium LO: 18.2

18. The issuer of bankers' acceptances is paying a promised yield of 5 percent. What would be the promised yield on securities of the bank guaranteeing this issue?

- A. Equivalent or less than 5%
- B. Higher than 5%
- C. Depends on the bank's liquidity
- D. Cannot be determined

Answer: A Type: Concept Difficulty: Medium LO: 18.2

19. Use the following statements to answer this question:

I. The major implication of backing money market funds by risky assets is an increase in money market spreads.

II. Bankers' acceptances yields are always lower than commercial paper yields.

- A. I and II are correct
- B. I and II are incorrect
- C. I is incorrect and II is correct
- D. I is correct and II is incorrect

Answer: A Type: Concept Difficulty: Medium LO: 18.2

Section 18.3 Bank Financing

20. The purpose of a covenant is to:

- A. protect the lender in the event of default by the borrower.
- B. protect the lender in the event of a deterioration of the credit quality of the borrower.
- C. protect the borrower in the event of default by the lender.
- D. protect the borrower in the event of a deterioration of the credit quality of the lender.

Answer: B Type: Concept Difficulty: Easy LO: 18.3

21. In general, a line of credit has a _____ maturity while a term loan has a _____ maturity.

- A. fixed; floating
- B. floating; fixed
- C. fixed; fixed
- D. floating; floating

Answer: B Type: Concept Difficulty: Easy LO: 18.3

22. In general a "floating rate" on a debt issue refers to:

- I. Variable payment times for the interest payments
 - II. Variable interest payments
 - III. Yield on the debt equals the average dividend yield on the Toronto Stock Exchange
- A. I and II
 - B. II
 - C. II and III
 - D. I and III

Answer: B Type: Definition Difficulty: Easy LO: 18.3

23. Which of the following is the least important for assessing the company's profile for a letter of credit?

- A. Current ratio
- B. Debt to equity ratio
- C. Price to earnings ratio
- D. Receivable turnover

Answer: C Type: Concept Difficulty: Easy LO: 18.3

24. Which one of the following does not explain why banks enjoy lower asymmetry of information?

- A. The bank has access to the firm's financial activity.
- B. The company relies on the bank for financing and other hedging activities.
- C. The company is required by law to give the bank access to privileged information.
- D. The company provides information to negotiate banking products.

Answer: C Type: Concept Difficulty: Medium LO: 18.3

25. A typical five-year revolving line of credit is characterized by:

- A. A fixed interest rate for the five years.
- B. A floating interest rate, renewed periodically during the five-year term.
- C. An interest rate that is lower than the prime rate because these lines of credit are only offered to the most credit worthy firms.
- D. B and C

Answer: B Type: Definition Difficulty: Medium LO: 18.3

Section 18.4 Long-Term Financing

26. Junk bonds are:

- A. a secured form of debt
- B. subordinated debentures
- C. a nickname for bonds traded in the Hong Kong market
- D. corporate bonds of bankrupt companies

Answer: B Type: Definition Difficulty: Easy LO: 18.4

27. When specific assets such as land, plant, or equipment are pledged as collateral, what is the term for the debt issue?

- A. debenture
- B. mortgage bond
- C. bond

D. secured debt

Answer: B Type: Definition Difficulty: Easy LO: 18.4

28. Choose the best statement:

- A. Mortgage bonds and debentures do not differ because they are both debt.
- B. In the event of bankruptcy, debenture holders get paid after the claims of preferred stockholders.
- C. Mortgages are secured by claims on specific real assets while debentures are not.
- D. Debentures are secured by claims on specific real assets while mortgages are not.

Answer: C Type: Definition Difficulty: Medium LO: 18.4

29. The North American Bat Experts Company (NABE) has just sold a batting machine to a Jamaican cricket team. The team will pay for the machine by borrowing the money from NABE and securing the loan using the machine. This type of debt is called:

- A. Debenture
- B. Acceptance
- C. Purchase-money mortgage
- D. Line of credit

Answer: C Type: Definition Difficulty: Medium LO: 18.4

30. Rank the following in order of priority in the event of bankruptcy:

- I. Subordinated, secured debt
 - II. Subordinated, unsecured debt
 - III. Unsubordinated, secured debt
 - IV. Unsubordinated, unsecured debt
- A. III, I, IV, II
 - B. IV, I, III, II
 - C. III, IV, I, II
 - D. IV, II, III, I

Answer: A Type: Definition Difficulty: Medium LO: 18.4

31. The Toronto Skaters Company currently has one issue of debt outstanding. Toronto Skaters has decided to borrow more money by issuing new debt with a higher priority in the event of bankruptcy. This could result in a violation of which type of covenant on the original debt?

- A. Standard negative pledge
- B. Cross-default clause
- C. The new issue will not violate any covenant as there are never covenants when a firm has only one issue of debt
- D. This type of transaction is illegal

Answer: A Type: Definition Difficulty: Medium LO: 18.4

Section 18.5 Bond Ratings

32. A junk bond is also known as:

- A. a second mortgage
- B. a high yield bond
- C. a line of credit

D. a subordinated unsecured bond

Answer: B Type: Definition Difficulty: Easy LO: 18.5

33. Use the following statements to answer this question:

A. The debt rating is supposed to fluctuate with the economic cycle.

B. Balance sheet strength refers to the ability of the firm to cover its liabilities.

A. I and II are correct

B. I and II are incorrect

C. I is incorrect and II is correct

D. I is correct and II is incorrect

Answer: C Type: Concept Difficulty: Medium LO: 18.5

34. A bond referred to as a “high yield bond” is most likely:

A. of the highest credit quality

B. of investment grade

C. of satisfactory credit quality

D. of speculative grade

Answer: D Type: Definition Difficulty: Medium LO: 18.5

35. Is it possible for a company to have two debt issues with different debt ratings?

A. No, the rating agency evaluates the credit worthiness of the company.

B. Yes, but only if the company is a multinational and the debt has been issued in different countries.

C. Yes, but only if the new issue is unseasoned.

D. Yes, the rating agency evaluates the credit worthiness of the issue not the company.

Answer: D Type: Concept Difficulty: Medium LO: 18.5

Practice Problems

36. The 30-day T-bill rate is 5%. The SWC Company has just issued \$100 million of commercial paper at par. There is a 0.1% chance the company will default on the issue. If the firm defaults, the commercial paper will be worth \$5 million. Determine the yield spread between the T-bill rate and commercial paper assuming that the required return by investors in commercial paper is equal to the T-bill rate.

Type: Calculation Difficulty: Medium LO: 18.2

Suggested answer:

The yield spread = promised yield on commercial paper – yield on T-bill

Calculating the promised yield on the commercial paper:

$$V = \frac{\text{PAR} * (1 + R) P + \text{Recover} * (1 - P)}{1 + K}$$

$$100\text{million} = \frac{100\text{million} * (1 + R) * 0.999 + 5\text{million} * 0.001}{(1 + \frac{0.05}{12})}$$

$$100,416,667 = 99.9\text{million} * (1 + R) + 5,000$$

$$1 + R = 1.005122$$

The promised annual yield = $0.005122 \times 12 = 6.146\%$

The yield spread is 1.146%.

37. The 30-day T-bill rate is 5 percent. Toronto Skaters has just issued \$100 million of commercial paper at par. If the firm defaults, the commercial paper will be worth \$5 million. The promised annual yield is 6.15 percent and the required rate of return is equivalent to the t-bill rate. What is the probability of default of Toronto Skaters?

Type: Calculation Difficulty: Medium LO: 18.2

Suggested answer:

$$100 = \frac{100(1 + \frac{6.15\%}{12})P + 5(1 - P)}{1 + \frac{5\%}{12}}; P = 0.001 \text{ and } (1 - P) = 0.999$$

38. Laurentide Resort Company would like to issue \$100 million of commercial paper. Define liquidity support and describe why it would be important to investors.

Type: Concept Difficulty: Medium LO: 18.3

Suggested answer:

A major concern with commercial paper (even though the issuers are very high quality companies) is whether the firm will have the funds available to repay the commercial paper at maturity if the firm can't roll-over the debt. The available funds are called the "liquidity support." As the firm doesn't want to hold cash to support the commercial paper, they may hold lines of credit at large banks in order to have the funds available at the maturity of the commercial paper.

The liquidity support is critical for investors for two reasons:

- i) investors want to be sure that they will be paid when the commercial paper matures
- ii) investors also want to be able to exit their commercial paper positions quickly and easily (i.e., commercial paper markets are expected to be very liquid)

39. The Globe Theatre Company is negotiating a line of credit with a large bank. The bank is willing to provide credit up to the minimum of 65% of the values of receivables or 70% of the inventory value. If the firm currently has receivables valued at \$50 million and inventory valued at \$60 million, what is the maximum credit limit available to this firm?

Type: Calculation Difficulty: Easy LO: 18.3

Suggested answer:

65% of receivables = \$32.5 million

70% of inventory = \$42.0 million

The maximum credit limit is \$32.5 million.

40. You have observed that the credit ratings of firms are very stable over time. However, you have also observed that the earnings of firms are cyclical. Explain how this is possible when credit ratings are supposed to reflect the credit risk of the firm's debt.

Type: Concept Difficulty: Medium LO: 15.5

Suggested answer:

The rating is supposed to be based on structural and not cyclical factors. Holders of long-term debt are expected to hold the debt through both the high earnings periods and low earnings periods and the debt rating for those debt issues should reflect the long-term credit worthiness of the firm.

41. Explain the implication of the failure of Lehman Brothers on short term debt yields, and how it was remedied.

Type: Concept

Difficulty: Medium LO: 15.2

Suggested answer:

The failure of Lehman Brothers in September 2008 led to a major fear of the insolvency of banks. Banks guarantee Bankers Acceptances and have major outstanding levels of short term debt. The rush to liquidate short term assets and the drying up of market liquidity led to a major spike in interest rates. The central banks all over the world provided banks with enough liquidity to honor their commitments.

Unauthorized

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Chapter 19: Equity and Hybrid Instruments

Multiple Choice Questions

Section 19.1 – Shareholders' Equity

1. When a corporation has only one class of shares, which of the following is **not** one of the rights of shareholders?

- A. To vote at any shareholder meeting of the corporation.
- B. To vote at any director meeting of the corporation.
- C. To receive any dividend declared by the corporation.
- D. To receive any residual property of the corporation on dissolution.

Answer: B Type: Definition Difficulty: Easy LO: 19.1

2. The following may or may not be in a list of shareholders' rights. Choose the letter that corresponds to the correct list of rights:

- 1. Share in dividends
- 2. Elect directors
- 3. Appoint managers
- 4. Vote in general meetings
- 5. Vote in directors' meetings
- 6. Examine the company records
- 7. Priority over unsecured junior debt
- 8. Issue new dividends
- 9. Declare a stock split

- A. 1, 2, 3, 5, 8
- B. 1, 2, 3, 5, 8, 9
- C. 1, 2, 4, 6
- D. 1, 2, 6, 9

Answer: C Type: Definition Difficulty: Medium LO: 19.1

3. Which of the following statements about family trusts is true?

- A. Family trusts separate ownership and control.
- B. Income flows to the trust beneficiaries.
- C. The trustees retain the voting power.
- D. All of the above statements are not true.

Answer: D Type: Definition Difficulty: Easy LO: 19.1

4. You are given the following shareholders' equity figures for Montreal Design Group Inc. (MDG) for fiscal year end of 2006, 2007, and 2008. What is MDG's book value per share for **each** of the three years, beginning with 2006?

\$ million	2006	2007	2008
Preferred stock	0	0	0
Capital stock	58,304	62,961	68,020
Retained earnings	194,442	227,601	102,770
Total shareholders' equity	252,746	290,562	170,790
Total liabilities and equity	745,136	792,792	673,613
Total common equity	252,746	290,562	170,790
Shares outstanding year end	101,027	101,358	101,784

(million)			
Common dividend per share (\$)	0.81	1.05	2.70*
* includes a special dividend of \$1.50			

- A. \$1.92, \$2.25, and \$1.01
- B. \$2.50, \$2.87, and \$1.68
- C. \$7.38, \$7.82, and \$6.62
- D. \$1.30, \$1.28, and \$1.66

Answer: B Type: Calculation Difficulty: Easy LO: 19.1

How each option was obtained:

- A. Retained earnings / Shares outstanding year end
- B. Total common equity / Shares outstanding year end
- C. Total liabilities and equity / Shares outstanding year end
- D. Total shareholders' equity / Retained earnings

5. You are given the following shareholders' equity figures for Toronto Skaters Inc. (TS) for fiscal year end of 2009. What is TS's market to book ratio?

\$ million	2009
Preferred stock	0
Capital stock	68,020
Retained earnings	102,770
Total shareholders' equity	170,790
Total liabilities and equity	673,613
Total common equity	170,790
Shares outstanding year end (million)	101,784
Common dividend per share (\$)	2.70*
Share Price	\$30.38
* includes a special dividend of \$1.50	

- A. 4.59
- B. 18.28
- C. 30.09
- D. 18.11

Answer: D Type: Calculation Difficulty: Medium LO: 19.1

How each option was determined:

- A. Market price / (Total liabilities and equity / Shares outstanding year end) = $30.38 / 6.62 = 4.59$
- B. Market price / (Total shareholders' equity / Retained earnings) = $30.38 / 1.66 = 18.28$
- C. Market price / (Retained earnings / Shares outstanding year end) = $30.38 / 1.01 = 30.09$
- D. Market price / (Total common equity / Shares outstanding year end) = $30.38 / (170,790/101,784) = 18.11$

6. You are given the following shareholders' equity figures for Toronto Skaters Inc. (TS) for fiscal year end of 2006. What is TS's dividend yield, including and excluding the special dividend?

\$ million	2006
Preferred stock	0
Capital stock	68,021
Retained earnings	102,770
Total shareholders' equity	170,790
Total liabilities and equity	673,613
Total common equity	170,790
Shares outstanding year end (million)	101,784
Common dividend per share (\$)	2.70*
Share Price	\$30.38
* includes a special dividend of \$1.50	

- A. 4.9%, 3.9%
- B. 8.9%, 3.9%
- C. 11.3%, 25.3%
- D. 2.7%, 1.2%

Answer: B

Type: Calculation Difficulty: Medium LO: 19.1

How each option was determined:

- A. Special div. / Market price = $1.50 / 30.38 = 4.9\%$; Regular div. / Market price = 3.9%
- B. Total div. / Market price = $2.70 / 30.38 = 8.9\%$; Regular div. / Market price = 3.9%
- C. Market price / Total div. = $30.38 / 2.70 = 11.3$; Market price / Regular div. = 25.3
- D. Total dividend as a percentage = 2.70% ; Regular dividend as a percentage = 1.20%

7. Residual owners are:

- A. Bond holders
- B. Equity holders
- C. Equity and preferred stocks holders
- D. All of the above

Answer: B

Type: Concept Difficulty: Easy LO: 19.1

8. Which of the following statements about dividends is **not** true?

- A. Dividends are attractive for individuals.
- B. Dividends are attractive for corporations.
- C. Dividends are tax deductible.
- D. Dividends received by one Canadian corporation from another Canadian corporation are not taxed.

Answer: C

Type: Definition Difficulty: Easy LO: 19.2

9. Use the following statements to answer this question:

- I. Today, the preemptive right is always used by corporations to protect their investors from dilution.

II. A common stock has the characteristics of a call option because it has unlimited upside potential.

- A. I and II are correct
- B. I and II are incorrect
- C. I is correct and II is incorrect
- D. I is incorrect and II is correct

Answer: D Type: Concept Difficulty: Medium LO: 19.2

Section 19.2 – Preferred Share Characteristics

10. Preferred shares are _____ financing.

- A. a form of debt
- B. a form of equity
- C. a combined form of debt and equity
- D. different from debt and equity

Answer: B Type: Definition Difficulty: Easy LO: 19.3

11. In the event of liquidation, preferred shareholders rank ahead of:

- A. subordinated debt holders
- B. secured debt
- C. common shareholders
- D. debentures

Answer: C Type: Definition Difficulty: Easy LO: 19.3

12. Which one of the following is the reason for paying a different price for different classes of shares in the case of a takeover?

- A. Prices depend on the tax treatment of each class.
- B. Prices depend on the dividend yield offered by the class.
- C. Prices depend on the voting rights of the shares.
- D. Prices depend on the floating of shares.

Answer: C Type: Concept Difficulty: Medium LO: 19.3

13. How would you price preferred shares?

- A. As an annuity
- B. As a growing annuity due
- C. As a perpetuity
- D. As a growing perpetuity

Answer: C Type: Concept Difficulty: Easy LO: 19.3

14. Use the following statements to answer this question:

- I. A retractable preferred share can be sold back to the issuer.
- II. Preferred stocks provide a benefit for taxes given that dividends paid receive preferential tax treatment as compared to interest income.

- A. I and II are correct
- B. I and II are incorrect
- C. I is correct and II is incorrect
- D. I is incorrect and II is correct

Answer: A Type: Concept Difficulty: Medium LO: 19.2

15. When dividends that have been in arrears are paid, the preferred shares have a _____ provision.

- A. participating
- B. cumulative
- C. non-cumulative
- D. retractable

Answer: B Type: Definition Difficulty: Easy LO: 19.3

16. The retraction feature protects:

- A. the shareholder from interest-rate risk.
- B. the issuer from interest-rate risk.
- C. either the shareholder or the issuer depending on the interest rates.
- D. both the shareholder and the issuer regardless of the interest rates.

Answer: A Type: Concept Difficulty: Medium LO: 19.3

17. Interest rates have gone up to 14 percent since you purchased your 10 percent preferred shares. You would be best off if the shares had a(n) _____ feature.

- A. call
- B. extraction
- C. redemption
- D. retraction

Answer: D Type: Concept Difficulty: Medium LO: 19.3

18. Which of the following characteristics apply to straight preferred shares?

- I. No maturity date
 - II. Pay a fixed dividend
 - III. Dividends are paid at regular intervals
 - IV. Have a positive yield spread over long Canada bonds
 - V. The right to sell them back to the issuer
- A. I and II
 - B. I, II, and III
 - C. I, II, III, and IV
 - D. I, II, IV, and V

Answer: C Type: Definition Difficulty: Easy LO: 19.3

19. What is the tax value of money?

- A. The difference between your before-tax and after-tax earnings.
- B. The tax rate multiplied by the total income reported to the government.
- C. Accounting for the fact that dividends are taxed more favourably than is interest income.
- D. Accounting for the fact that dividends are not taxed while interest income is taxable.

Answer: C Type: Definition Difficulty: Easy LO: 19.3

20. Which of the following characteristics apply to retractable preferred shares?

- I. No maturity date

- II. Pay a fixed dividend at regular intervals
- III. Have a negative yield spread (before tax) over midterm Canada bonds
- IV. The right to sell them back to the issuer
- A. I and II
- B. I, II, and III
- C. I, II, III, and IV
- D. II, III, and IV

Answer: D Type: Definition Difficulty: Medium LO: 19.3

21. Which of the following characteristics apply to floating rate preferred shares?

- I. Long maturity date
- II. Pay a fixed dividend
- III. Dividends are paid at regular intervals
- IV. Have a positive yield spread (after tax) over bankers' acceptances
- V. The right to sell them back to the issuer
- A. I and II
- B. I, II, and III
- C. III, IV, and V
- D. I, III and IV

Answer: D Type: Definition Difficulty: Medium LO: 19.3

22. In which of the following ways are some preferred shares similar to bonds?

- I. Call provisions
- II. Convertible features
- III. Retraction provisions
- IV. Rated by rating agencies
- A. I, II, and III
- B. I, II, and IV
- C. II and III
- D. I, II, III, and IV

Answer: D Type: Definition Difficulty: Medium LO: 19.3

Section 19.3 – Income Trusts

23. Which of the following statements about income trusts is **not** true?

- A. Income trusts became very popular because of their tax-efficient structure.
- B. As of January 2011, all income trusts will be required to pay taxes at prevailing corporate tax rates.
- C. All income from the underlying operating company flows through to the trust unitholders.
- D. Distributions by trusts are not taxable in the hands of unitholders.

Answer: D Type: Definition Difficulty: Easy LO: 19.3

24. Which of the following is one of the main reasons why IPO activity was greatly reduced in Canada in 2007?

- A. Interest rates were too low to make going public profitable.
- B. The threat of an overheated market caused some companies to postpone their IPOs.

C. The 2006 announcement of changes in income trust tax requirements made the trust structures less attractive.

D. The global financial crisis hurt financial market values.

Answer: C Type: Concept Difficulty: Easy LO: 19.3

25. Use the following statements to answer this question:

I. Income trusts are loopholes in the Canadian tax system that benefited corporations only.

II. The trust capital structure is very different from the corporate capital structure.

A. I and II are correct

B. I and II are incorrect

C. I is correct and II is incorrect

D. I is incorrect and II is correct

Answer: D Type: Concept Difficulty: Medium LO: 19.3

Section 19.4 – Warrants and Convertible Securities

26. In which of the following ways do warrants differ from call options?

I. Warrants impact the firm while call options do not.

II. Call options have shorter maturities than warrants.

III. Any profit received from call options is taxable while that from warrants is not taxable.

IV. Volatility increases the value of call options but makes warrants less valuable.

V. The longer maturities of warrants make them less valuable.

A. I, II, and III

B. I, III, and V

C. II, IV, and V

D. I and II

Answer: D Type: Definition Difficulty: Medium LO: 19.4

27. A company has 20 million shares outstanding that are trading at \$30 per share. The company has 2 million warrants outstanding that have an exercise price of \$28 per share. What is the payoff to the warrant holders exercising them, rounded to the nearest dollar?

A. \$36,363,636

B. \$3,636,364

C. – \$3,636,364

D. \$4,000,000

Answer: B Type: Calculation Difficulty: Medium LO: 19.4

How each option was obtained:

$m = 2$ million, $n = 20$ million, $V = \$30 \times 20 \text{ million} = \$600 \text{ million}$, $S = \$30$, $X = \$28$

A. $n / (n + m) * (V - (n * X)) = 20 / (22) * (600 - (20 * 28)) = \$36,363,636$

B. $m / (n + m) * (V - (n * X)) = 2 / (22) * (600 - (20 * 28)) = \$3,636,364$

C. $m / (n + m) * ((n * X) - V) = 2 / (22) * ((20 * 28) - 600) = -\$3,636,364$

D. $(S - X) * n = (30 - 28) * (2 \text{ million}) = \$4,000,000$

28. Issuing bonds plus warrants is similar to issuing:

A. Retractable bonds

B. Convertible bonds

C. Floating rate bonds

D. Preferred shares

Answer: B Type: Concept Difficulty: Medium LO: 19.4

29. Warrants are similar to the call options on the stocks. What's the equivalent of the strike price?

- A. The initial price of the warrant
- B. The market price of the warrant
- C. The price of exercise of the warrant
- D. None of the above

Answer: C Type: Concept Difficulty: Easy LO: 19.4

30. Use the following statements to answer this question:

- I. A warrant's value is due, in part, to its long term maturity.
- II. The intrinsic value of a warrant does not depend on the volatility of the stock.

- A. I and II are correct
- B. I and II are incorrect
- C. I is correct and II is incorrect
- D. I is incorrect and II is correct

Answer: C Type: Concept Difficulty: Medium LO: 19.4

31. Which of the following support the rationale for issuing convertible bonds?

- A. To reduce underwriting costs
- B. To permit cheaper initial financing
- C. To minimize dilution
- D. All of the above are good reasons for issuing convertible bonds

Answer: D Type: Concept Difficulty: Medium LO: 19.4

32. The _____ specifies the number of shares received for each convertible bond.

- A. conversion price
- B. subscription price
- C. conversion ratio
- D. subscription ratio

Answer: C Type: Definition Difficulty: Medium LO: 19.4

33. Which of the following is true regarding convertible bonds?

- A. The convertible bond value is unrelated to the value of the stock.
- B. The value of convertible debt is a function of the risk of default.
- C. The conversion factor can be separated from the bond and sold separately to other investors.
- D. When a bond is converted into stock, the company receives additional funds as part of the conversion.

Answer: B Type: Concept Difficulty: Medium LO: 19.4

34. Hudson Bay Fishing corporation has issued bonds that can be converted into common shares when the share price is \$40. The current market price of the stock is \$35. The bond has a face value of \$1,000 and currently sells for \$975. What is the conversion ratio for this bond?

A. 25

- B. 28.6
- C. 24.4
- D. 27.9

Answer: A Type: Calculation Difficulty: Medium LO: 19.4

How each option was determined:

- A. $\$1000 / 40 = 25$
- B. $\$1000 / 35 = 28.6$
- C. $\$975 / 40 = 24.4$
- D. $\$975 / 35 = 27.9$

35. The conversion premium is defined as which of the following?

- A. The number of shares that a convertible security can be exchanged for.
- B. The price at which a convertible security can be converted into common shares.
- C. The value of a convertible security if it is immediately converted into common shares.
- D. The percentage difference between the value at which the bonds are trading and their conversion value.

Answer: D Type: Definition Difficulty: Easy LO: 19.4

36. The price at which a convertible bond would sell for if it could not be converted into common stock is called:

- A. Floor value
- B. Straight bond value
- C. Convertible bond value
- D. Conversion value

Answer: B Type: Definition Difficulty: Easy LO: 19.4

37. Which of the following statements regarding convertible bonds is true?

- A. The floor value is the lowest price for which a convertible bond will be sold.
- B. The convertible bond's floor value is determined by the maximum of the straight bond value and the conversion value.
- C. If the share price rises above the conversion price, investors will convert the bonds.
- D. All of the above statements are true.

Answer: C Type: Concept Difficulty: Medium LO: 19.4

38. A 12% coupon bond has 20 years to maturity when market rates on similar non-convertible bonds are 9.25%. It is convertible into 20 common shares and has a \$1,000 par value. The shares are currently trading at \$40. What is the straight bond value, assuming it pays annual coupons?

- A. \$1,247
- B. \$1,000
- C. \$1,207
- D. \$1,287

Answer: A Type: Calculation Difficulty: Medium LO: 19.4

How each option was determined:

- A. $PMT = -120$, $N = 20$, $FV = -1000$, $I/Y = 9.25\%$, compute $PV = \$1,247$
- B. $PMT = -120$, $N = 20$, $FV = -1000$, $I/Y = 12\%$, compute $PV = \$1,000$

- C. $[PMT = -120, N = 20, FV = -1000, I/Y = 9.25\%, \text{compute } PV = \$1,247] - \$40 = \$1,207$
 D. $[PMT = -120, N = 20, FV = -1000, I/Y = 9.25\%, \text{compute } PV = \$1,247] + \$40 = \$1,287$

39. A 12% coupon bond has 20 years to maturity when market rates on similar non-convertible bonds are 9.25%. It is convertible into 20 common shares and has a \$1,000 par value. The shares are currently trading at \$40. What is the floor value of the bond, assuming it pays annual coupons?

- A. \$1,247
 B. \$1,000
 C. \$800
 D. \$2,000

Answer: A Type: Calculation Difficulty: Medium LO: 19.4

How each option was determined:

- A. Floor value = $\max [PMT = -120, N = 20, FV = -1000, I/Y = 9.25\%, \text{compute } PV = \$1,247, 20 \times \$40 = \$800] = \$1,247$
 B. Floor value = $\max [PMT = -120, N = 20, FV = -1000, I/Y = 12\%, \text{compute } PV = \$1,000, 20 \times \$40 = \$800] = \$1,000$
 C. Floor value = $\min [PMT = -120, N = 20, FV = -1000, I/Y = 9.25\%, \text{compute } PV = \$1,247, 20 \times \$40 = \$800] = \$800$
 D. Floor value = $\max [PMT = -120, N = 20, FV = -1000, I/Y = 9.25\%, \text{compute } PV = \$1,247, 40 \times 50 = \$2,000] = \$2,000$

40. A 10% semiannual coupon bond has 10 years to maturity when market rates on similar non-convertible bonds are 8.5%. It is convertible into 40 common shares and has a \$1,000 par value. The shares are currently trading at \$25. What is the floor value of the bond, assuming it pays semi-annual coupons?

- A. \$2,000
 B. \$1,099.71
 C. \$1,098.42
 D. \$1,000.00

Answer: B Type: Calculation Difficulty: Medium LO: 19.4

How each option was determined:

- A. Floor value = $\max [PMT = -50, N = 20, FV = -1000, I/Y = 4.25\%, \text{compute } PV = \$1099.71, 50 \times 40 = \$2000] = \$2000$
 B. Floor value = $\max [PMT = -50, N = 20, FV = -1000, I/Y = 4.25\%, \text{compute } PV = \$1099.71, 25 \times 40 = \$1000] = \$1099.71$
 C. Floor value = $\max [PMT = -50, N = 20, FV = -1000, I/Y = 10\%, \text{compute } PV = \$1,000, 25 \times 40 = \$1000] = \$1,000$
 D. Floor value = $\max [PMT = -100, N = 10, FV = -1000, I/Y = 8.5\%, \text{compute } PV = \$1,098.42, 25 \times 40 = \$1000] = \$1098.42$

Section 19.5 – Other Hybrids

41. Which of the following factors are considered when determining whether a security is debt or equity?

- I. Permanence factor
 II. Subordination factor

III. Objective factor

IV. Legal factor

V. Subjective factor

A. I and II

B. I, II, and III

C. I, II, and IV

D. I, II, IV, and V

Answer: D Type: Concept Difficulty: Easy LO: 19.5

42. If you are to allocate the amount of hard retractable preferred shares in the financial statements, where would they go?

A. Assets

B. Liabilities

C. Ownership equity

D. None of the above

Answer: B Type: Concept Difficulty: Easy LO: 19.5

43. If you are to allocate the amount of soft retractable preferred shares in the financial statements, where would they go?

A. Assets

B. Liabilities

C. Ownership equity

D. None of the above

Answer: C Type: Concept Difficulty: Easy LO: 19.5

44. Which of the following is the hard retraction requirement?

A. The preferred shares must be paid off with common shares or other preferred shares.

B. The preferred shares must be paid off with cash.

C. The preferred shares must be paid off within 30 days of retraction.

D. The preferred shares can only be retracted in cases of financial distress.

Answer: B Type: Definition Difficulty: Easy LO: 19.5

45. Which of the following statements regarding income bonds is/are true?

A. They appear similar to debt but are closer to equity.

B. They are generally issued after a reorganization.

C. The interest is tied to some level of the cash flow of the firm.

D. All of the above statements are true.

Answer: D Type: Definition Difficulty: Easy LO: 19.5

46. Which of the following is **not** an example of an indexed bond?

A. Commodity bond

B. Real return bond

C. Income bond

D. Callable bond

Answer: D Type: Definition Difficulty: Easy LO: 19.5

47. Which of the following securities provides a firm with results similar to those of a real return bond?

- A. Adjustable rate convertible subordinated securities
- B. Liquid yield option notes
- C. Income bond
- D. Original issue discount bond

Answer: D Type: Definition Difficulty: Easy LO: 19.5

Practice Problems

48. Discuss how preferred shares have features of both debt and equity instruments.

Type: Concept Difficulty: Medium LO: 19.2

Suggested answer:

Debt and preferred shares are similar in that preferred shares usually receive regular, fixed payments. The par value of preferred shares is similar to the face value of debt. Both are ranked ahead of common shareholders.

Common and preferred shares are similar in that neither imposes any contractual obligations on the firm. Both forms are subject to similar tax treatment in the hands of the investor.

49. What are the costs and benefits of preferred share financing?

Type: Concept Difficulty: Difficult LO: 19.2

Suggested answer:

Preferred shares impose no contractual obligations on the firm. The payment of dividends can be held off to preserve cash without the risk of bankruptcy. Both this, and the fact that preferred shares rank behind all debt, make preferred shares more risky. A higher level of risk must be compensated with a higher return to the investor. Thus, the firm has to trade-off the non-constraining benefits with the higher required yield on preferred shares.

50. Montreal Financing has preferred shares with a par value of \$20 outstanding. These shares pay \$1.60 in dividends annually.

- (a) What will be the market price of these shares if the current market yield is 11 percent?
- (b) What will be the market price of these shares if the current market yield is 11 percent and the issue is retractable in five years at the par value?
- (c) What is the value of this retractable feature? Why does it have value?
- (d) What will be the market price of these shares if the issue is immediately redeemable and retractable at par?

Type: Calculation Difficulty: Difficult LO: 19.3

Suggested Answer:

$$1.60 * \left[\frac{1 - \frac{1}{1.11^5}}{.11} \right] + 20 * \left(\frac{1}{1.11^5} \right) = \$17.78$$

(b) Price = \$

(c) The value of the retractable option is \$17.78 – \$14.55 = \$3.23

It has value since the price with retraction is less than the price with the retraction option, assuming the interest rates stay the same.

(d) The price would be very close to the par value.

51. A firm has \$45,000,000 of preferred shares outstanding that have a yield of 10 percent on par and are callable at a 3 percent premium. New issues will cost \$980,000 in issuing and underwriting expenses.

a. At what interest rates would the firm want to refinance?

b. If the dividend yield drops to 8 percent, how long will it take before the present value of the interest savings exceeds the cost of refinancing?

Type: Calculation

Difficulty: Difficult

LO: 19.3

Suggested answer:

$$\begin{aligned} \text{a. Initial after-tax outlay} &= \text{call premium} + \text{expenses} \\ &= \$45,000,000 \times 0.03 + \$980,000 \\ &= \$2,330,000 \end{aligned}$$

Let d = current dividend yields on comparable issues.

PV of future dividend savings = $\$45,000,000(0.10 - d) \div d$

NPV = 0 = $-\$2,330,000 + \$45,000,000(0.10 - d) \div d$

$d = 9.51\%$

Therefore, at interest rates of 9.51 percent or lower, the firm would refinance.

$$45,000,000 * (0.1 - 0.08) \left[\frac{1 - \frac{1}{1.08^n}}{.08} \right] = 45,000,000 * 0.03 + 980,000$$

Solving for the number of years: $n = 3.02$ years

Therefore, it will take a little over 3 years before the present value of the interest savings exceeds the cost of refinancing.

52. You want to buy a portfolio of financial securities consisting of three, \$1,000 face value Government of Canada bonds and 500 preferred shares of Laurentide Resort Inc.

Laurentide Resort has a preferred share series trading on the Toronto Stock Exchange. It pays a dividend of \$0.56 semi-annually. The required rate of return on the stock is 12 percent compounded semi-annually. The bonds have 4 years to maturity and an 8 percent semi-annual coupon. Currently, the yield to maturity on these bonds is 10 percent compounded semi-annually.

a. What is the current intrinsic value of Laurentide Resort's preferred stock?

b. What is the current price of the 4-year coupon bonds?

c. What is the current value of your portfolio (i.e., bonds + preferred stock)?

d. It is now 2 years later. Market interest rates have dropped and the yield to maturity on these bonds is now 8 percent. What is the value of the bonds at this time?

e. It is still 2 years later and the yield to maturity has dropped to 8%. Assume that the price of Laurentide Resort Inc. is now \$8.50. What is the expected annual rate of return on your portfolio over the two years from your investment?

Type: Calculation

Difficulty: Difficult

LO: 19.3

Suggested answer:

$$4 * \left[\frac{1 - \frac{1}{1.05^8}}{.05} \right] + 100 * \left(\frac{1}{1.05^8} \right) = 93.5368$$

- b. Price of Bonds = or \$935.37 per bond
 c. Value of portfolio = $\$9.33 \times 500 + \$935.37 \times 3 = \$7,471$ (\$7,472.77 without rounding)
 d. Bond Price = \$1,000, since the coupon rate equals the discount rate, the bonds are trading at par
 e. Value of portfolio 2 years later = $\$8.50 \times 500 + \$1,000 \times 3 = \$7,250$

$$\$7,472.77 = (\$280 + \$120) * \left[\frac{1 - \frac{1}{(1+r)^4}}{r} \right] + \$7,250$$

$r = 4.66\%$ per semi-annual period or 9.54% effective annualized rate.

53. Explain the importance of warrants in financing for firms.

Type: Concept Difficulty: Medium LO: 19.5

Suggested answer:

Warrants are important to finance growth for firms. Since warrants are contracts between the investors and the company itself, the proceeds from the sale of the warrants and the strike price itself is a cash infusion for the firm.

54. Why is there a difference between the way the market classifies debt and the way the CRA classifies it.

Type: Concept Difficulty: Medium LO: 19.2

Suggested answer:

The Canadian Revenue Agency classifies debt based on the ability to deduct interest expenses from the revenue of the firm. The market on the other hand thinks about securities in terms of their rights in the company and priority for payment in case of distress.

55. Describe convertible debt.

Type: Definition Difficulty: Medium LO: 19.4

Suggested answer:

Convertible debt is debt that, at the option of the holder, may be converted into the common shares of the issuing firm. It can be viewed as a combination of normal debt and an option to acquire common shares.

56. Explain the difference between the conversion price and the conversion ratio.

Type: Concept Difficulty: Medium LO: 19.4

Suggested answer:

The conversion price is the portion of the senior security's face value to be surrendered for each common share when the option to convert is exercised. The conversion price is generally set above the prevailing market price of the common shares at the time of issue. The conversion ratio specifies the number of shares received for each senior security upon conversion.

57. Explain how the value of convertible debt varies as a function of the common share price.

Type: Concept Difficulty: Medium LO: 19.4

Suggested answer:

Apart from interest rates and maturity, the value of debt is a function of the risk of default. The debt value decreases rapidly for low share values, as decreasing share price is an indication of financial difficulty. As share prices increase, the debt value levels off. At some point, the conversion value will begin to dominate, and at high share prices, the value of a convertible security is determined mainly by its conversion feature.

58. Give four reasons why companies use convertibles to raise capital instead of straight debt.

Type: Concept Difficulty: Medium LO: 19.4

Suggested answer:

1. It may permit cheaper initial financing or financing with fewer restrictive covenants. The conversion privilege is a sweetener as it combines the safety of a senior security with the capital gains potential of common shares.
2. It provides a vehicle for possible common share financing at prices above those prevailing at the time.
3. It enables the issuer to attract investors that are faced with legal constraints restricting direct investment in common shares.
4. Underwriting costs are likely to be lower than for straight new equity financing.

59. Explain how equity can be viewed as a call option on the firm.

Type: Concept Difficulty: Difficult LO: 19.5

Suggested answer:

A company's common shares can be viewed essentially as a call option on the assets of the firm, with an exercise price equal to the value of the enterprise's outstanding debt. Due to the feature of limited liability, common shareholders face the same limited downside risk as options holders. At the same time, if circumstances warrant, they can claim full ownership benefits by paying off the debt holders (this is equivalent to exercising the option).

60. Explain how a warrant is viewed as a call option on the firm.

Type: Concept Difficulty: Medium LO: 19.4

Suggested answer:

A warrant is an option to buy stocks at a certain price. Essentially, it represents the same cash inflows as a call option. If the price of the stock is lower than the strike price, the holder of the warrant would not exercise it. If the outcomes are similar to those of the option, it should be priced like an option.

61. Explain an important implication of viewing a company's common stock as a call option.

Type: Concept Difficulty: Difficult LO: 19.5

Suggested answers:

1. The theory of option valuation provides important insights into the valuation of common shares.
2. The view of common shares as options with limited downside risk and asymmetric payoffs as a function of asset values provides valuable insights into risk sharing between shareholders and debt holders, with implications for debt contracts and decisions regarding a firm's capital structure.

62. Toronto Skaters firm currently has \$1,000,000 of 8 percent convertible debt outstanding. The coupon interest is paid on an annual basis. The \$1,000 face value debentures mature in 12 years and have a conversion price of \$50. Similar straight debt currently yields 7 percent. The firm's common stock is currently trading for \$55 per share. What is the current straight debt value and the current conversion value of the convertibles? What is the floor price for the convertibles? If all the convertible holders decided to convert, how many additional shares would have to be issued?

Type: Calculation

Difficulty: Difficult LO: 19.4

$$80 * \left[\frac{1 - \frac{1}{1.07^{12}}}{.07} \right] + 1000 * \left(\frac{1}{1.07^{12}} \right) = \$635.41 + \$444.01 = \$1,079.42$$

Straight debt value =

Conversion ratio = $1,000 \div 50 = 20$

Conversion value = Conversion ratio $\times$ Current stock price
 $= 20 \times \$55 = \$1,100.00$

The present floor price is \$1,100.00

Total new shares issued = number of convertibles $\times$ N
 $= \$1,000,000 \div \$1,000 \times 20 = 20,000$ shares

63. Hudson Bay Fishing Corporation has just issued a 10-year, 9 percent annual-pay bond with a \$1,000 face value. In addition, the bond was issued with 50 detachable warrants. The bond was issued at par. Each warrant gives the owner the right to purchase 2 shares of the company's stock for \$15 each. Bonds with equivalent risk but with no attached warrants currently yield 11 percent. What is the value of one warrant?

Type: Calculation

Difficulty: Difficult LO: 19.4

$$90 * \left[\frac{1 - \frac{1}{1.011^{10}}}{0.011} \right] + 1000 * \left(\frac{1}{1.011^{10}} \right) = \$882.22$$

Value of the straight bond =

Value of the 50 warrants = $\$1,000 - \$882.22 = \$117.78$

Value of one warrant = $\$117.78 \div 50 = \$2.36$

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Chapter 20: Cost of Capital

Multiple Choice Questions

Section 20.1 Financing sources

1. Which of the following is the least permanent source of capital for a firm?

- A. A 10% coupon bond purchased 3 years ago
- B. Preferred stocks
- C. 10% coupon bonds issued 10 years ago
- D. Accounts payable

Answer: D Type: Definition Difficulty: Easy LO: 20.1

2. Using the following information, determine the debt-to-equity ratio for the Montreal Computing Power Company.

Balance sheet of the Montreal Computing Power Company:			
Cash and marketable securities	75	Accruals	100
Inventory	350	Accounts payable	350
Prepaid expenses	150	Short-term debt	250
Current assets	1,500	Other current liabilities	500
Net fixed assets	3,925	Long-term debt	2,800
		Shareholders' equity	2,000
Total assets	6,000	Total liabilities and shareholders' equity	6,000

- A. 1.400
- B. 1.525
- C. 1.775
- D. 1.950

Answer: B Type: Calculation Difficulty: Easy LO: 20.1

How each choice was determined:

- A. $2800/2000 = 1.400$
- B. $(2800+250)/2000 = 1.525$
- C. $(2800+250+500)/2000 = 1.775$
- D. $(2800+250+500+350)/2000 = 1.950$

3. Using the following information, determine the market-to-book ratio for the Montreal Computing Power Company.

Balance sheet of the Montreal Computing Power Company:			
Cash and marketable securities	75	Accruals	100
Inventory	350	Accounts payable	350
Prepaid expenses	150	Short-term debt	250
Current assets	1,500	Other current liabilities	500
Net fixed assets	3,925	Long-term debt	2,800
		Shareholders' equity	2,000
Total assets	6,000	Total liabilities and	6,000

		shareholders' equity	

The Montreal Computing Power Company has 1,000 common shares outstanding. The shares were issued 10 years ago at \$4 per share and currently trade at a price of \$3

- A. 0.667
- B. 0.933
- C. 1.400
- D. 1.500

Answer: D Type: Calculation Difficulty: Easy LO: 20.1

How each choice was determined:

- A. $2000/3000 = 0.667$
- B. $2800/3000 = 0.933$
- C. $2800/2000 = 1.400$
- D. $3000/2000 = 1.500$

4. The required rate of return on Montreal Computing Power's equity is 15 percent and the yield on their debt is 7 percent. There are no taxes and all cash flows are perpetuities. If the value of the debt is \$1,000 and value of the equity is \$2,000, what level of earnings must Montreal Computing Power earn in order to support the current valuation?

- A. \$290
- B. \$300
- C. \$330
- D. \$370

Answer: D Type: Calculation Difficulty: Easy LO: 20.1

How each choice was determined:

- A. $0.15 \times 1000 + .07 \times 2000 = \$290$
- B. $.15 \times 2000 = \$300$
- C. $(.07 + .15) \times 2000 = \$330$
- D. $0.07 \times 1000 + .15 \times 2000 = \$370$

5. Use the following statements to answer this question:

- I. Regulated industries offer their shareholders a limited required rate of return
- II. Regulated industries have a very low level of debt.

- A. I and II are correct
- B. I and II are incorrect
- C. I is correct and II is incorrect
- D. I is incorrect and II is correct

Answer: C Type: Definition Difficulty: Medium LO: 20.1

6. Which one of the following is true about book and market values?

- A. Book to market values provide information about the efficient use of assets.
- B. A high book to market ratio is well perceived by the market.
- C. If the return on equity is lower than the required rate of return, the market to book ratio will decrease.
- D. Determining prices in regulated industries depends on the market value of assets.

Answer: C Type: Concept Difficulty: Medium LO: 20.1

Section 20.2 The Cost of Capital

7. Which of the following is *not* needed to determine a firm's WACC?

- A. The value of the preferred shares at issuance.
- B. The market value of the debt.
- C. The current share price.
- D. The current yield on preferred shares.

Answer: A Type: Concept Difficulty: Medium LO: 20.2

8. A firm has a capital structure that uses 45 percent equity, 20 percent preferred shares, and 35 percent debt. The preferred shares have a current yield of 5.5 percent. The debt has a coupon rate of 10 percent and a current yield to maturity of 6.5 percent. The common shares have a yield of 8 percent. There are no taxes. What is the firm's WACC?

- A. 6.575%
- B. 6.975%
- C. 7.275%
- D. 8.200%

Answer: B Type: Calculation Difficulty: Easy LO: 20.2

How each choice was determined:

- A. $0.45 \times 5.5\% + .20 \times 6.5\% + .35 \times 8\% = 6.575\%$
- B. $0.45 \times 8\% + .20 \times 5.5\% + .35 \times 6.5\% = 6.975\%$
- C. $0.45 \times 5.5\% + .20 \times 10\% + .35 \times 8\% = 7.275\%$
- D. $0.45 \times 8\% + .20 \times 5.5\% + .35 \times 10\% = 8.200\%$

9. Use the following statements to answer this question:

- I. Without taxes, the benefit of having debt on the WACC largely vanishes.
- II. Preferred shares cost the same as common equity financing.

- A. I and II are correct
- B. I and II are incorrect
- C. I is correct and II is incorrect
- D. I is incorrect and II is correct

Answer: C Type: Concept Difficulty: Medium LO: 20.2

10. A firm has a capital structure that uses 45 percent equity, 20 percent preferred shares and 35 percent debt. The preferred shares have a current yield of 5.5 percent. The debt has a coupon rate of 10 percent and a current yield to maturity of 6.5 percent. The common shares have a yield of 8 percent. The tax rate is 25 percent. What is the firm's WACC?

- A. 5.231%
- B. 6.700%
- C. 6.406%
- D. 6.975%

Answer: C Type: Calculation Difficulty: Easy LO: 20.2

How each choice was determined:

- A. $(0.45 \times 8\% + .20 \times 5.5\% + .35 \times 6.5\%) \times (1 - .25) = 5.231\%$
- B. $0.45 \times 8\% + .20 \times 5.5\% \times (1 - .25) + .35 \times 6.5\% = 6.700\%$
- C. $0.45 \times 8\% + .20 \times 5.5\% + .35 \times 6.5\% \times (1 - .25) = 6.406\%$

$$D. 0.45 \times 8\% + .20 \times 5.5\% + .35 \times 6.5\% = 6.975\%$$

11. An analyst has obtained the following information about the Maudite Brewers Co.: Book value of assets \$25,000; book value of common equity \$10,000; book value of preferred stock \$5,000. The company has 4,000 common shares outstanding which are currently trading at \$5 per share. The company has 3,000 preferred shares outstanding which are currently trading at \$2 per share. The yield on the debt equals the coupon rate. The weights used to determine the weighted average cost of capital are:

Common Equity:	Preferred Equity:	Debt:
A. 55.56%	16.67%	27.77%
B. 40%	20%	40%
C. 80%	10%	10%

D. Cannot be determined, we need the market value of debt.

Answer: A Type: Calculation Difficulty: Medium LO: 20.2

How each choice was determined:

MV of each component: $4,000 \times 5 = \$20,000$; $3,000 \times 2 = \$6,000$; $\$10,000$

A. $\$20,000/\$36,000 = 55.56\%$; 16.67% ; 27.77%

B. $\$10,000/\$25,000 = 40\%$; $\$5,000/\$25,000 = 20\%$; 40%

C. $\$20,000/\$25,000 = 80\%$; 10% ; 10%

12. A firm has 2 million shares outstanding, which are currently trading at \$45 per share and have a dividend yield of 10 percent. The firm also has \$40 million of 6 percent bonds outstanding that are currently trading at 110.0, with a yield to maturity of 3 percent. There are no preferred shares and no taxes. What is the WACC?

- A. 7.70%
- B. 7.85%
- C. 8.69%
- D. 8.77%

Answer: A Type: Calculation Difficulty: Medium LO: 20.2

How each choice was determined:

A. $(.1 \times 90 + .03 \times 44)/(45 \times 2 + 40 \times 110\%) = 7.70\%$

B. $(.1 \times 90 + .03 \times 40)/(90 + 40) = 7.85\%$

C. $(.1 \times 90 + .06 \times 44)/(90 + 44) = 8.69\%$

D. $(.1 \times 90 + .06 \times 40)/(90 + 40) = 8.77\%$

13. A firm has 2 million shares outstanding, which are currently trading at \$45 per share and have a dividend yield of 10 percent. The firm also has \$40 million of 6 percent bonds outstanding that are currently trading at 110.0 with a 5 year maturity. There are no preferred shares and no taxes. What is the WACC?

- A. 7.70%
- B. 7.85%
- C. 7.95%
- D. 8.77%

Answer: C Type: Calculation Difficulty: Medium LO: 20.2

How choices are determined:

- A. $(.1*90 + .03*44)/(45*2 + 40*110\%) = 7.70\%$
- B. $(.1*90 + .03*40)/(90+40) = 7.85\%$
- C. $(.1*90 + .03768*44)/(45*2 + 40*110\%) = 7.95\%$
- D. $(.1*90 + .06*40)/(90+40) = 8.77\%$

Section 20.3 Estimating the Component Costs

14. A firm's cost of debt can best be estimated:

- A. by adding a risk premium to the coupon rate.
- B. using the yield-to-maturity on newly-issued debt of other firms.
- C. using the firm's borrowing rate on short-term loans.
- D. using the yield-to-maturity on the firm's outstanding debt.

Answer: D Type: Definition Difficulty: Easy LO: 20.3

15. Which of the following statements is/are true about the marginal cost of capital?

- A. The weighted average cost of capital is of the next dollar raised.
- B. For most levels of financing, it equals the weighted average cost of capital.
- C. It exceeds the weighted average cost of capital due to flotation costs.
- D. All of the above are true.

Answer: D Type: Definition Difficulty: Medium LO: 20.3

16. Which of the following is most relevant for estimating a firm's cost of debt?

- A. The yield to maturity at issuance.
- B. The return bondholders would demand for new debt.
- C. The coupon rate on existing debt.
- D. None of the above is relevant.

Answer: B Type: Definition Difficulty: Medium LO: 20.3

17. Use the following statements to answer this question:

- I. The cost of debt of the firm is always constant.
 - II. The estimation of the cost of debt using the yield to maturity requires the price of the bonds now.
- A. I and II are correct
 - B. I and II are incorrect
 - C. I is correct and II is incorrect
 - D. I is incorrect and II is correct

Answer: D Type: Concept Difficulty: Medium LO: 20.3

18. If a firm's debt-to-equity ratio is 3, what is the weighted average cost of capital for the firm if the required rate of return is 12.4 percent and cost of debt is 8.4 percent?

- A. 11.4%
- B. 11.06%
- C. 9.73
- D. 9.4%.

Answer: D Type: Calculation Difficulty: Medium LO: 20.3

How choices are determined:

- A. $.25*8.4 + .75*12.4 = 9.4$

- B. $0.66 \times 12.4 + 0.37 \times 8.4 = 11.06$
- C. $0.33 \times 12.4 + 0.67 \times 8.4 = 9.73$
- D. $0.75 \times 8.4 + .25 \times 12.4 = 9.4$

19. When determining the costs of each component of a firm's capital structure, the firm must evaluate the:

- A. marginal costs of new funds
- B. total costs of new funds
- C. average costs of new funds
- D. average costs of old and new funds

Answer: A Type: Concept Difficulty: Medium LO: 20.3

20. The cost of a security to a company may differ from the security's yield in the capital markets due to:

- I. Flotation costs
- II. Agency costs
- III. Taxes
- A. I only
- B. I and II only
- C. I and III only
- D. I and II and III

Answer: C Type: Concept Difficulty: Medium LO: 20.3

21. Toronto Skaters Company is an all equity company and is able to fund a \$1 million investment using cash. The company has a beta of 1.4, the risk-free rate is 3 percent, and the return on the market is 8 percent. Flotation costs for new equity are 3 percent. The tax rate is zero. The appropriate cost of capital is:

- A. 0% as the firm is using cash.
- B. 0% as the firm is using funds that have already been raised from the capital markets.
- C. The required return on the outstanding equity.
- D. The cost of equity taking into account the flotation costs.

Answer: C Type: Concept Difficulty: Difficulty LO: 20.3

22. Toronto Skaters Company is an all equity company and is able to fund a \$1 million investment using cash. The company has a beta of 1.4, the risk-free rate is 3 percent, and the return on the market is 8 percent. Flotation costs for new equity are 2 percent. The tax rate is 40 percent. What is the WACC of the investment?

- A. 14.2%
- B. 10%
- C. 8%
- D. 6.6%

Answer: B Type: Calculation Difficulty: Easy LO: 20.6

- A. $8 + 3 = 11\%$
- B. $(8 - 3) \times 1.4 + 3 = 10\%$
- C. 8%
- D. $(8 + 3) \times (1 - 0.4) = 6.6\%$

23. Laurentide Union Bank is expected to pay a dividend of \$4.20 per share in one year. The dividend is expected to grow at a rate of 5 percent forever. If the current market price for a share of Laurentide Union Bank is \$40 what is the cost of equity?

- A. 5.00%
- B. 9.52%
- C. 10.50%
- D. 15.50%

Answer: D Type: Calculation Difficulty: Difficult LO: 20.3

How each choice was determined:

- A. 5.00%
- B. $40/4.2 = 9.52\%$
- C. $\$4.20 / \$40 = 10.50\%$
- D. $\$40 = 4.20/(k - .05)$. $k = 15.50\%$

24. The long-term debt of Laurentide Union Bank is currently selling for 103 percent of its face value. The issue matures in 20 years and pays an annual coupon of 8 percent of face. The corporate tax rate is 40 percent. What is the after-tax cost of debt for Laurentide Union?

- A. 3.08%
- B. 4.62%
- C. 4.80%
- D. 7.70%

Answer: B Type: Calculation Difficulty: Medium LO: 20.3

How each choice was determined:

- A. $YTM \times .4 = 3.08\%$
- B. $YTM \times (1-.4) = 4.62\%$
- C. $8\% \times (1-.4) = 4.80\%$
- D. Price = $103\% \times 1000 = 1,030$; annual coupon = \$80, N=20, YTM = 7.70%

25. The Northwest Territories Bikini Company can issue new 20-year debt at par value which pays 8 percent annual coupons. The before-tax issuing costs are 1.5 percent of par. The tax rate is 40 percent. The firm's after-tax cost of debt is:

- A. 4.80%
- B. 4.86%
- C. 4.89%
- D. 8.09%

Answer: B Type: Calculation Difficulty: Difficult LO: 20.3

How each choice was determined:

- A. $8\% \times (1-.40) = 4.80\%$
- B. $8.09\% \times (1-.4) = 4.86\%$
- C. NP = $1000(1-.015)=985$, YTM = 8.15%, after tax = 4.89%
- D. NP = $1000(1 - .015 \times (1-.4)) = \$991$. Coupon = \$80, N=20 YTM = 8.09%

26. The Quebec Poutine Company can issue new 10-year debt at par value which pay 6 percent annual coupons, paid semiannually. The market is buying these bonds at 98 percent of face value. The tax rate is 40 percent. The firm's after-tax cost of debt is:

- A. 7.5%
- B. 5.1%
- C. 3.76%
- D. 4.5%

Answer: C Type: Calculation Difficulty: Difficult LO: 20.3

How choices are determined:

- A. $6 + 1.5 = 7.5\%$
- B. $6 * (1 - 0.4) + 1.5 = 5.1$
- C. $PV = -980, N = 20, FV = 1000, PMT = 30$ Compute $I/Y = 3.14\%$; $3.14 * 2 * (1 - .4) = 3.76$
- D. $(6 + 1.5) * (1 - 0.4) = 4.5\%$

27. The Bay James Water Park Company's preferred shares pay an annual dividend of \$3.00 per share. What is the cost of preferred stock if the current price is \$80 per share and after tax flotation costs are \$6 per share?

- A. 4.05%
- B. 3.75%
- C. 7.50%
- D. 7.79%

Answer: A Type: Calculation Difficulty: Medium LO: 20.3

How each choice was determined:

- A. $\$3 / (80 - 6) = 4.05\%$
- B. $\$3 / 80 = 3.75\%$
- C. $\$6 / 80 = 7.50\%$
- D. $\$6 / (80 - 3) = 7.79\%$

Section 20.4 The Effects of Operating and Financial Leverage

28. The Poutine Company is considering offering long-term contracts to many of its non-contract employees (a switch to fixed labour costs from variable labour costs). What is the impact of this decision?

- A. The increase in operating leverage results in greater variability in operating income.
- B. The increase in operating leverage results in less variability in operating income.
- C. The decrease in operating leverage results in greater variability in operating income.
- D. The decrease in operating leverage results in less variability in operating income.

Answer: A Type: Definition Difficulty: Easy LO: 20.4

29. The management of the Bay James Water Park is concerned about the volatility of the firm's net income. In order to reduce this volatility, they are planning on issuing new stock to repurchase debt and to enter into more fixed contracts with suppliers. The effect of these actions is likely to be:

- A. A reduction of volatility of net income due to the reduction in financial leverage.
- B. An increase in volatility of net income due to the reduction in financial leverage.
- C. A reduction of volatility of net income due to the reduction in financial leverage and increase in operating leverage.
- D. The impact on the volatility of net income is unclear as the effects of the reduction in financial leverage and increase in operating leverage are opposite.

Answer: D Type: Concept Difficulty: Difficult LO: 20.4

30. Use the following statements to answer this question:

- I. The source of volatility in operating income is caused by fixed costs.
 - II. Operating leverage does not necessarily increase with increases in the volatility of net income.
- A. I and II are correct
 - B. I and II are incorrect
 - C. I is correct and II is incorrect
 - D. I is incorrect and II is correct

Answer: A Type: Concept Difficulty: Medium LO: 20.4

Section 20.5 Growth Models and the Cost of Common Equity

31. The Toronto Skaters Co. has a return on equity of 8 percent and pays out 25 percent of earnings in dividends. The expected growth in dividends is:

- A. 2%
- B. 6%
- C. 8%
- D. 10%

Answer: B Type: Calculation Difficulty: Easy LO: 20.5

How each choice was determined:

- A. $.08 * 25\% = 2\%$
- B. $.08 * (1-25\%) = 6\%$
- C. 8%
- D. Arbitrary

32. According to the Boston Consulting Group, a firm with a low present value of existing operations but a high present value of growth opportunities would be classified as:

- A. A dog
- B. A cash cow
- C. A star
- D. A turnaround firm

Answer: D Type: Definition Difficulty: Easy LO: 20.5

33. According to the Boston Consulting Group, a cash cow is characterized by:

- A. High present value of existing operations and low present value of growth opportunities
- B. High present value of existing operations and high present value of growth opportunities
- C. Low present value of existing operations and low present value of growth opportunities
- D. Low present value of existing operations and high present value of growth opportunities

Answer: A Type: Definition Difficulty: Easy LO: 20.5

34. The manager of Montreal Trustco has noticed that as he increases the dividend payout ratio, the value of the firm's equity declines. This is most likely due to:

- A. The firm's return on equity is lower than the required return on equity
- B. The firm's return on equity is higher than the required return on equity
- C. The firm's return on equity is equal to the required return on equity
- D. None of the above is likely explanations

Answer: B Type: Concept Difficulty: Difficult LO: 20.5

35. The manager of Montreal Trustco has noticed that as he increases the dividend payout ratio, the value of the firm's equity increases. This is most likely due to:

- A. The firm's return on equity is lower than the required return on equity
- B. The firm's return on equity is higher than the required return on equity
- C. The firm's return on equity is equal to the required return on equity
- D. None of the above is likely explanations

Answer: A Type: Concept Difficulty: Difficult LO: 20.5

36. Use the following statements to answer this question:

- I. A firm's growth depends on its reinvestment opportunities.
- II. Increasing the firm's retention ratio does not always increase the value of the firm.

- A. I and II are correct
- B. I and II are incorrect
- C. I is correct and II is incorrect
- D. I is incorrect and II is correct

Answer: A Type: Concept Difficulty: Difficult LO: 20.5

37. Montreal Trustco expects to pay a dividend of \$5 next year. Dividends are expected to grow at 3 percent forever and the market requires a rate of return of 7 percent on its stock. Montreal Trustco can issue new stock at \$125 per share with flotation costs of \$20 per share. The tax rate is zero. The cost of issuing new equity to Montreal Trustco is:

- A. 3.00%
- B. 7.00%
- C. 7.76%
- D. 11.76%

Answer: C Type: Calculation Difficulty: Easy LO: 20.5

How each choice was determined:

- A. 3.00%
- B. 7.00%
- C. $k = 5 / (125 - 20) + 3\% = 7.76\%$
- D. $5 / (125 - 20) + 7\% = 11.76\%$

38. The Third Cup Company has a return on equity of 10 percent and pays out 30 percent of earnings as dividends. The company is expected to pay a dividend of \$2 next year and the current stock price is \$20. The cost of equity of the Third Cup Company is:

- A. 17%
- B. 13%
- C. 10%
- D. 7%

Answer: A Type: Calculation Difficulty: Difficult LO: 20.5

How each choice was determined:

- A. $\text{Growth} = 10\% * (1 - 30\%) = 7\%$; $\$20 = 2 / (k - .07)$ $k = 17\%$
- B. $g = .1 * .3 = 3\%$; $\$20 = \$2 / (k - .03)$ $k = 13\%$
- C. $\$2 / \$20 = 10\%$
- D. $10\% * (1 - 30\%) = 7\%$

39. The Third Cup Company has just paid a dividend of \$3 per share. The dividends are expected to grow at a rate of 4 percent per year forever. The current stock price is \$25 per share. The firm faces a tax rate of 40 percent and flotation costs of 5% on new stock issues. The cost of equity for internal funds is:

- A. 9.89%
- B. 10.12%
- C. 16.48%
- D. 16.87%

Answer: C Type: Calculation Difficulty: Difficult LO: 20.5

How each choice was determined:

- A. $16.48\% * (1-.4) = 9.89\%$
- B. $16.87\% * (1-.4) = 10.12\%$
- C. $25 = 3 * (1.04) / (k - .04)$ $k = 16.48\%$
- D. $NP = 25 * (1-.05 * (1-.4)) = 24.25$, $24.25 = 3 * (1.04) / (k - .04)$ $k = 16.87\%$

40. The Boreale Company has just paid a dividend of \$3 per share. The dividends are expected to grow at a rate of 4 percent per year forever. The current stock price is \$25 per share. The firm faces a tax rate of 40 percent and flotation costs of 5 percent on new stock issues. The cost of equity for new funds is:

- A. 9.89%
- B. 10.12%
- C. 16.48%
- D. 16.87%

Answer: D Type: Calculation Difficulty: Difficult LO: 20.5

How each choice was determined:

- A. $16.48\% * (1-.4) = 9.89\%$
- B. $16.87\% * (1-.4) = 10.12\%$
- C. $25 = 3 * (1.04) / (k - .04)$ $k = 16.48\%$
- D. $NP = 25 * (1-.05 * (1-.4)) = 24.25$, $24.25 = 3 * (1.04) / (k - .04)$, $k = 16.87\%$

41. The Montreal Film Festival Company has a book value per share of \$10 and a current return on equity of 7 percent. The firm expects to invest \$100 next year and earn a return of 10 percent on that investment. The market requires a rate of return of 5 percent on the firm's equity. The present value of existing opportunities and the present value of growth opportunities are:

- A. PVEO = \$95.24; PVGO = \$14.00
- B. PVEO = \$14.00; PVGO = \$95.24
- C. PVEO = \$10.00; PVGO = \$100.00
- D. PVEO = \$100.00; PVGO = \$10.00

Answer: B Type: Calculation Difficulty: Easy LO: 20.5

How each choice was determined:

- A. PVEO = \$95.24; PVGO = \$14.00
- B. $PVEO = 7\% * \$10 / .05 = \$14.00$; $PVGO = (\$100 / 1.05) * (.10 - .05) / .05 = \$95.24$
- C. PVEO = \$10.00; PVGO = \$100.00
- D. PVEO = \$100.00; PVGO = \$10.00

Section 20.6 Risk-Based Models and the Cost of Common Equity

42. The Saguenay tourism Company has a beta of 1.30, the risk free rate is 4 percent and the return on the market is 10 percent. The required return on the firm's equity is:

- A. 6.0%
- B. 10.0%
- C. 11.8%
- D. 17.0%

Answer: C Type: Calculation Difficulty: Easy LO: 20.6

How each choice was determined:

- A. 6%
- B. 10%
- C. $4\% + 1.3 \times (10\% - 4\%) = 11.8\%$
- D. $4\% + 1.3 \times 10\% = 17\%$

43. Use the following statements to answer this question:

- I. Beta is a measure of the contribution of the security to the market return within a well diversified portfolio.
 - II. The market model is comprehensive in terms of explaining the performance of the firm.
- A. I and II are correct
 - B. I and II are incorrect
 - C. I is correct and II is incorrect
 - D. I is incorrect and II is correct

Answer: A Type: Concept Difficulty: Medium LO: 20.6

44. The Saguenay Tourism Company has a beta of .80, the risk-free rate is 4 percent and the market risk premium is 6 percent. The required return on the firm's equity is:

- A. 4.0%
- B. 5.6%
- C. 8.8%
- D. 6.0%

Answer: C Type: Calculation Difficulty: Easy LO: 20.6

How each choice was determined:

- A. 4%
- B. $4\% + .80 \times (6\% - 4\%) = 5.6\%$
- C. $4\% + .80 \times 6\% = 8.8\%$
- D. 6%

45. The Saguenay Tourism Company is an all equity company and is able to fund a \$1 million investment using cash. The company has a beta of 1.4, the risk-free rate is 2 percent, and the return on the market is 8 percent. Flotation costs for new equity are 5 percent. The tax rate is zero. The appropriate cost of capital is:

- A. 0.00%
- B. 5.00%
- C. 10.40%
- D. Greater than 10.40%

Answer: C Type: Calculation Difficulty: Medium LO: 20.6

How choices were determined:

- A. 0.00%
- B. 5.00%
- C. $k = 2\% + 1.4 \times (8\% - 2\%) = 10.40\%$
- D. Greater than 10.40%

Section 20.7 The Cost of Capital and Investment

46. Use the following statements to answer this question:

- I. The WACC is the most appropriate rate to discount future cash flows of average risk.
- II. The investment opportunities schedule uses WACC as a threshold for investment
- A. I and II are correct
- B. I and II are incorrect
- C. I is correct and II is incorrect
- D. I is incorrect and II is correct

Answer: A Type: Definition Difficulty: Medium LO: 20.6

Practice Problems

47. The Laurentide Resort has just paid a dividend of \$3. The current stock price is \$25. The beta of the company is 1.3, the risk-free rate is 2 percent and the market risk premium is 6 percent. The firm earns a return on equity of 7%. Is this a growth firm?

Type: Concept Difficulty: Easy LO: 20.5

Suggested answer:

The return on the stock required by the market using CAPM = $2\% + 1.3 \times 6\% = 9.8\%$.

As ROE < required return, this is not a growth firm.

48. The Toronto Skaters Company has a D/E ratio of 1.5. The company has 1,000 shares outstanding and a beta of 1.2. The risk-free rate is 3 percent and the market risk premium is 5 percent. The company has 10 year debt with a face value of \$1 million and annual coupons of 4 percent. The debt is currently trading at 105. The tax rate is 35 percent. Calculate the weighted average cost of capital for the Toronto Skaters Company.

Type: Calculation Difficulty: Medium LO: 20.5

Suggested Answer:

Value of debt: $1.05 \times \$1 \text{ million} = \$1.05 \text{ million}$

Yield to maturity: $PV = \$1.05 \text{ million}$, annual coupons = \$40,000, term = 10 years. The YTM is : 3.4%

After-tax cost of debt = $3.4\% \times (1 - 0.35) = 2.21\%$

Value of equity: D/E = 1.5. As value of debt = \$1.05 million, the value of equity must be $\frac{2}{3} \times \$1.05 \text{ million} = \$700,000$

Cost of equity = $3\% + 1.2 \times 5\% = 9\%$

WACC = $(9\% \times 0.7 \text{ million} + 2.21\% \times \$1.05 \text{ million}) / (\$1.75 \text{ million}) = 4.927\%$

49. A firm is going to finance a new project 100 percent with debt, through a new bond issue. Since the firm is only using debt to finance the project, the NPV of the project should be calculated using the cost of debt as the discount rate. Is this statement true, false, or uncertain? Explain.

Type: Concept Difficulty: Difficult LO: 20.3

Suggested Answer:

The statement is false. The cost of capital for a new project depends on the use of funds, not the source. Even if this particular project will be funded with debt, it is probably only one of many projects that the firm undertakes. The firm, over time, will raise financing through a number of sources, including internal funds, new equity, new preferred shares, and new debt. The source of funding for this project is from the pool of available funds. Therefore the cost of capital for the project should be the WACC, appropriately adjusted for the risk of this particular project.

50. What is the cost of internally generated funds?

Type: Concept Difficulty: Difficult LO: 20.3

Suggested Answer:

Internally generated funds can either be paid out to shareholders in the form of dividends or reinvested in the firm to finance future investments. Shareholders expect the firm to either pay an appropriate return on those reinvested funds or else pay them out as dividends. The required return demanded by shareholders on reinvested funds is equal to the required return on equity.

51. Explain the reasoning behind the Fed's stock valuation model and how it estimates the overvaluation or undervaluation of the stock market.

Type: Concept Difficulty: Difficult LO: 20.5

Suggested answer:

The Fed's stock valuation model estimates the price of the market based on aggregate earnings estimated by IBES. Analysts' forecasts incorporate the market expectation about the long term growth of earnings. On the other hand, the cost of equity over the long term is estimated by the 10-year yield. This measure proved to be good in measuring the deviation of the price of stocks from the intrinsic value estimated by this measure.

52. The Pataty Patata Company is considering a project which costs \$1 million. The project will generate constant perpetual earnings. The firm has just paid a dividend of \$5 and dividends are expected to be constant forever. The current value of one share of stock is \$25. The firm has 100,000 shares outstanding. The firm also has perpetual debt with a market value of \$3 million and annual coupons of \$300,000. The firm pays taxes at the rate of 35%. The firm will not need to issue new securities to finance the project. Determine the minimum annual cashflows that must be generated by the project in order for the project to be undertaken. Demonstrate that the project will satisfy the requirements of the capital providers.

Type: Calculation Difficulty: Difficult LO: 20.3, 20.4, 20.5

Suggested answer:

Step 1: for the project to add value, it must have an NPV greater than or equal to zero. To determine the minimum total after-tax earnings, we need to determine the WACC of the firm.

Cost of debt: (before tax) = $300,000 / \$3 \text{ million} = 10\%$

After-tax cost of debt = $10\% * (1 - .35) = 6.5\%$

Cost of equity:

$\$25 = \$5/(k) \rightarrow \text{cost of equity} = 20\%$

$\text{WACC} = (20\% * 2.5 + 6.5\% * 3) / 5.5 = 12.6364\%$

The project will need to generate an after-tax cash flow of $12.6364\% * \$1 \text{ million} =$

$\$126,363.6364$. On a pre-tax basis, the cash flow needs to be $\$194,405.5944$ per year.

Demonstrate that this cash flow satisfies the requirements of each capital provider:

The fraction of the project financed by debt = $3/5.5 = 54.5455\%$

EBIT		\$194,405.5944
Interest on debt	$.545455 \times 1m \times .10$	\$54,545.4546
Tax on earnings	$.35 \times (E-I)$	\$48,951.0490
Earnings available for shareholders		\$90,909.0908

Fraction of project financed by common stock = 45.4545%

Required cash flows that can be given to shareholders = $0.454545 \times 1 \text{ million} \times .20 = \$90,909$.

Investing in a project that earns at least the WACC will satisfy the requirements of all the providers of capital.

Unauthorized

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Chapter 21: Capital Structure Decisions**Multiple Choice Questions:****Section 21.1 Financial Leverage**

1. Indifference analysis is developed through the relationship between:

- A. debt-equity ratio and expected earnings
- B. earnings before interest and taxes and earnings per share
- C. beta and expected return
- D. after-tax earnings and earnings per share

Answer: B Type: Definition Difficulty: Easy LO: 21.1

2. Above the break-even point for earnings before interest and taxes, increased debt will _____ earnings per share.

- A. decrease
- B. increase
- C. remain unchanged
- D. Can't be determined with the existing information

Answer: B Type: Definition Difficulty: Easy LO: 21.1

3. Which of the following represent limitations of indifference analysis?

- I. Indifference analysis does not consider how equity investors may react to the increased risk due to increased leverage.
- II. Indifference analysis fails to account for corporate taxes.
- III. Indifference analysis ignores sinking fund payments.

- A. I only
- B. I and II
- C. I and III
- D. I, II and III

Answer: A Type: Concept Difficulty: Easy LO: 21.1

4. Which of the following is not a result of increasing debt?

- A. A decrease in the financial flexibility of the firm
- B. An increase in the sales breakeven point.
- C. An increase in managers' flexibility to spend money.
- D. An increase in the cost of borrowing.

Answer: C Type: Concept Difficulty: Medium LO: 21.1

5. The indifference analysis refers to the indifference of:

- A. Earnings with respect to two alternative financing plans
- B. Sales with respect to the cost of debt.
- C. Cost of equity with respect to debt structure.
- D. Risk of bankruptcy with respect to debt structure.

Answer: A Type: Concept Difficulty: Medium LO: 21.1

6. Increasing the use of debt increases the variability of:

- A. Return on equity (ROE)

B. Return on investment (ROI)

C. Increasing the use of debt has no effect on ROE and ROI because it is a fixed charge.

D. All of the above

Answer: A Type: Concept Difficulty: Medium LO: 21.1

7. Increasing the operating or business risk of a firm will increase the variability of:

A. Return on equity (ROE)

B. Return on investment (ROI)

C. Increasing the operating or business risk of the firm has no effect on the variability of ROE and ROI

D. Both A. and B. above

Answer: D Type: Concept Difficulty: Medium LO: 21.1

8. The Northwest Territories Bikini Company reported the following financial data for the period ended 200x.

Sales	\$50,000
Variable costs	\$10,000
Fixed Rent	\$25,000
Interest expense	\$5,000
Book value of equity	\$15,000
Book value of debt	\$25,000
Tax rate	20%

The return on equity (ROE) of the Northwest Territories Bikini Company is closest to:

A. 0.1333

B. 0.3000

C. 0.3750

D. 0.5333

Answer: D Type: Definition Difficulty: Medium LO: 21.1

$$\frac{(EBIT - I)(T)}{SE} = 0.1333$$

$$ROI = \frac{EBIT(1 - T)}{SE + D} = \frac{15,000 * .8}{15,000 + 25,000} = 0.3000$$

$$\frac{EBIT}{SE + B} = \frac{15,000}{15,000 + 25,000} = 0.3750$$

C.

$$ROE = \frac{(EBIT - I)(1 - \text{tax})}{\text{book value of shareholders equity}} = \frac{(15,000 - 5,000)(1 - .2)}{15,000} = 0.5333$$

D.

9. The Northwest Territories Bikini Company reported the following financial data for the period ended 2008:

Sales	\$50,000
Variable costs	\$10,000
Fixed Rent	\$25,000
Interest expense	\$5,000
Book value of equity	\$15,000
Book value of debt	\$25,000
Tax rate	20%

The return on investment (ROI) of the Northwest Territories Bikini Company is closest to:

- A. 0.1333
- B. 0.3000
- C. 0.3750
- D. 0.5333

Answer: B

Type: Definition

Difficulty: Medium LO: 21.1

$$\frac{(EBIT - I)(T)}{SE} = 0.1333$$

$$ROI = \frac{EBIT(1 - T)}{SE + B} = \frac{15,000 * .8}{15,000 + 25,000} = 0.3000$$

$$\frac{EBIT}{SE + B} = \frac{15,000}{15,000 + 25,000} = 0.3750$$

C.

$$ROE = \frac{(EBIT - I)(1 - \text{tax})}{\text{book value of shareholders equity}} = \frac{(15,000 - 5,000)(1 - .2)}{15,000} = 0.5333$$

D.

10. At the EPS indifference point, two companies would have:

- A. The same sales level regardless of the number of outstanding shares.
- B. The same sales level regardless of the debt to equity ratio.
- C. The same earnings per share regardless of the number of shares.
- D. The same EPS regardless of the financing scheme adopted.

Answer: D

Type: Concept

Difficulty: Medium LO: 21.1

11. In 2009, the Toronto Skaters earned a return on investment (ROI) of 15% and had a cost of debt of 7 percent. The book value of debt was \$25,000 and the book value of shareholders equity was \$30,000. The firm faces a tax rate of 30 percent. The firm's return on equity is:

- A. 19.92%

- B. 22.08%
 C. 23.42%
 D. 27.12%

Answer: C Type: Calculation Difficulty: Medium LO: 21.1

$$ROI + (ROI - R_D(1+T)) \frac{B}{SE} = 15\% + (15\% - 7\% * 1.3)(25 / 30) = 19.92\%$$

A.

$$ROE = ROI + (ROI - R_D(1-T)) \frac{B}{SE} = 15\% + (15\% - 7\% * 0.7)(25 / 30) = 23.42\%$$

$$ROI + (ROI - R_D(1-T)) \frac{SE}{B} = 15\% + (15\% - 7\% * 0.7)(30 / 25) = 27.12\%$$

D.

12. Determine the EPS indifference EBIT level for the Poutine Company for the following two scenarios: A debt/equity ratio of .6, pre-tax cost of debt is 8 percent, annual interest payments are \$2,000 and the company has 1,000 shares outstanding. In scenario 2, the firm is all equity financed and has 1,500 shares outstanding. The tax rate is 40 percent for both scenarios.

The EPS indifference EBIT level for Poutine Company is:

- A. \$10,000
 B. \$6,000
 C. \$4,000
 D. \$2,000

Answer: B Type: Calculation Difficulty: Medium LO: 21.1

How choices were determined:

$$\frac{(EBIT - 2,000)(1 - .4)}{1,000} = \frac{EBIT(1 - .4)}{1,500}$$

$$EBIT^* = 6,000$$

$$(EBIT - 2000) = \frac{2}{3} EBIT$$

- C.
 D. Arbitrary

Section 21.2 Determining Capital Structure

13. When measuring the potential effect of leverage on a firm, what must we consider?

- A. The stock of debt outstanding

- B. The maturity of the debt outstanding
- C Any sinking fund payments
- D. All of the above

Answer: D Type: Concept Difficulty: Easy LO: 21.2

14. Compared to non-investment grade firms, investment grade firms, in general, do not exhibit:

- A. Higher coverage ratios
- B. Higher cash flow to debt ratios
- C. Lower Return on Assets
- D. Lower liquidity

Answer: C Type: Definition Difficulty: Easy LO: 21.2

15. Use the following statements to answer this question:

- I. The correlation between the Altman Z-score and the rating by rating agencies is negative
- II. Investments grade firms have a low yield to maturity

- A. I and II are correct
- B. I and II are incorrect
- C. I is correct and II is incorrect
- D. I is incorrect and II is correct

Answer: C Type: Concept Difficulty: Medium LO: 21.2

Section 21.3 The Modigliani and Miller (M&M) Irrelevance Theorem

16. In order to show that capital structure is irrelevant, we need which of the following assumptions?

- A. Perfect markets
- B. No taxes
- C. Risk free debt
- D. All of the above are critical

Answer: D Type: Definition Difficulty: Easy LO: 21.3

17. The M&M proof of capital structure irrelevance relies on:

- A. Arbitrage arguments
- B. Personal and corporate leverage are perfect substitutes
- C. Both of the above
- D. Neither of the above

Answer: C Type: Concept Difficulty: Medium LO: 21.3

18. In the absence of taxes and bankruptcy costs, which of the following is true?

- A. The total value of the firm is dependent on the firm's capital structure.
- B. Investors can undo the leverage that the corporation has undertaken.
- C. Adding debt to the capital structure creates value.
- D. Shareholders will pay a premium for shares merely because a firm chooses to introduce financial leverage.

Answer: B Type: Concept Difficulty: Medium LO: 21.3

19. Which one of the following is an example of homemade leverage?

- A. An investor borrows money to invest in a car.
- B. An investor sells part of her stocks to put down a down payment.
- C. An investor borrows money to invest more in a company that she owns.
- D. An investor invests in the derivatives of a firm.

Answer: C Type: Concept Difficulty: Easy LO: 21.3

20. In a world with no taxes and no bankruptcy costs, the

- A. firm's value is unaffected by capital structure.
- B. firm should maximize the value of the firm by maximizing the firm's debt.
- C. firm should borrow to the point where the marginal benefits of debt equal the marginal costs.
- D. firm cannot make a decision about the optimal capital structure with the existing information.

Answer: A Type: Concept Difficulty: Medium LO: 21.3

21. The Poutine Cheese Co. operates in a world with zero taxes and zero risk of financial distress. The firm has a debt/equity ratio of 2. The cost of debt is 6% and the cost of equity for KatPat is 15%. If the firm's EBIT (a perpetuity) is \$10,000, then the market value of the firm is:

- A. \$47,619
- B. \$66,667
- C. \$111,111
- D. \$166,667

Answer: C Type: Calculation Difficulty: Medium LO: 21.3

How answers were obtained:

A. $\$10,000 / ((12+2)*6\%/2)/2) = \$47,619$

$$k_n = 15\%(1/3) + 6\%(2/3) = 9\%$$

C. , $V = \$10,000 / 0.09 = \$111,111$

D. $\$10,000 / .06 = \$166,667$

22. The Poutine Cheese Co. operates in a world with zero taxes and there is no risk of financial distress. Currently the firm has a D/E ratio of 3.5, a cost of debt of 8 percent and a cost of equity of 15 percent. Xin, a junior analyst, states that if the firm increases their use of debt their WACC should decrease. Xin is:

- A. Correct because as we increase the use of debt the WACC should decrease as we are increasing our use of a cheaper source of capital (cost of debt < cost of equity).
- B. Correct because according to M&M the value of the firm is unchanged as we increase the level of debt but the net income of the firm will decline (due to increased interest payments). The only way the value of the firm can remain the same is if the WACC decreases.
- C. Incorrect because as we increase the use of debt we increase the riskiness of the equity and therefore the cost of equity will increase. The net effect is that the WACC remains constant.
- D. Incorrect because the firm's D/E ratio is already above the firm's optimal level and any further increase in debt will result in an increase in WACC and a decrease in firm value.

Answer: C Type: Concept Difficulty: Difficult LO: 21.3

23. What would happen to a firm that uses an excessive amount of debt in a world with no taxes?

- A. The value of the firm would increase because of the increase in the assets of the firm.

B. The value of the firm would decrease because of the increase in the present value of distress costs.

C. It is completely irrelevant to the size of the firm.

D. The value of distress costs do not affect a firm in a tax free world.

Answer: B Type: Concept Difficulty: Difficult LO: 21.3

24. The Bay James Water Park Company operates in a world with zero taxes and no financial distress. The firm has a debt/equity ratio of 1. The cost of equity to Bay James Water Park is 15 percent and the cost of debt is 8 percent. The only difference between the Lanudiere Resort Company and Bay James Water Park is that Lanudiere Resort has a debt/equity ratio of 2.

According to M&M, the weighted average cost of capital for Lanudiere Resort will be:

A. Greater than the weighted average cost of capital for Bay James Water Park

B. The same as the weighted average cost of capital for Bay James Water Park

C. Less than the weighted average cost of capital for Bay James Water Park

D. Insufficient information provided to answer the question.

Answer: B Type: Concept Difficulty: Difficult LO: 21.3

25. The Bay James Water Park Company operates in a world with zero taxes and no financial distress. The firm has a debt/equity ratio of 1. The cost of equity to Bay James Water Park is 15 percent and the cost of debt is 8 percent. The only difference between the Lanudiere Company and Bay James Water Park is that Lanudiere Resort has a debt/equity ratio of 2. According to M&M, the cost of equity for Lanudiere Resort will be:

A. Greater than the cost of equity for Bay James Water Park

B. The same as the cost of equity for Bay James Water Park

C. Less than the cost of equity for Bay James Water Park

D. Insufficient information provided to answer the question.

Answer: A Type: Concept Difficulty: Easy LO: 21.3

26. The Bay James Water Park Company operates in a world with zero taxes and no financial distress. The firm has a debt/equity ratio of 1. The cost of equity to Bay James Water Park is 15 percent and the cost of debt is 8 percent. The only difference between the Lanudiere Resort Company and Bay James Water Park is that Lanudiere Resort has a debt/equity ratio of 2.

According to M&M, the value of Lanudiere Resort will be:

A. Greater than Bay James Water Park

B. The same as Bay James Water Park

C. Less than Bay James Water Park

D. Insufficient information provided to answer the question.

Answer: B Type: Concept Difficulty: Easy LO: 21.3

27. The Bay James Water Park Company operates in a world with zero taxes and no financial distress. The firm has a debt/equity ratio of 2. The cost of equity to Bay James Water Park is 20 percent. The only difference between the Lanudiere Resort Company and Bay James Water Park is that Lanudiere Resort has a debt/equity ratio of 0 and has a cost of equity of 15 percent. What is the cost of debt for Bay James Water Park?

A. 5.0%

B. 10.0%

C. 12.5%

D. 17.5%

Answer: C Type: Calculation Difficulty: Medium LO: 21.3

How choices were determined:

A. Cost of levered equity – cost of unlevered equity

$$15\% = 20\% * \frac{1}{3} + k_d \frac{2}{3} \quad k_d = 12.5\%$$

C.

D. Arbitrary

28. The Bay James Water Park Company operates in a world with zero taxes and no financial distress. The firm has a debt/equity ratio of 1. The cost of equity to Bay James Water Park is 12 percent and the cost of debt is 5 percent. The only difference between the Lanudiere Resort Company and Bay James Water Park is that Lanudiere Resort has a debt/equity ratio of 0. What is the cost of equity for Lanudiere Resort?

A. 5.0%

B. 8.5%

C. 12.0%

D. 17.0%

Answer: B Type: Calculation Difficulty: Easy LO: 21.3

How choices were determined:

A. Cost of debt of levered firm

B. WACC of levered firm (WACC constant in this world)

C. Cost of equity of levered firm

D. Sum of cost of equity of levered firm and cost of debt

29. The Bay James Water Park Company operates in a world with zero taxes and no financial distress. The firm has a debt/equity ratio of 1. The cost of equity to Bay James Water Park is 15 percent and the cost of debt is 8 percent. The only difference between the Lanudiere Resort Company and Bay James Water Park is that Lanudiere Resort has a debt/equity ratio of 2. What is the cost of equity for Lanudiere Resort?

A. 11.5%

B. 13.25%

C. 15.0%

D. 18.5%

Answer: D Type: Calculation Difficulty: Medium LO: 21.3

How choices were determined:

A. WACC of Bay James Water Park

B. $11.5\% = K_e * 2/3 + 8\% * 1/3$

C. Cost of equity of Bay James Water Park

D. $11.5\% = K_e * 1/3 + 8\% * 2/3$

Section 21.4 The Impact of Taxes

30. In a world with corporate taxes but no bankruptcy costs, the
- A. firm value is unaffected by capital structure.
 - B. firm should maximize the value of the firm by maximizing the firm's debt.
 - C. firm should borrow to the point just below where the marginal benefits of debt equal the marginal costs.
 - D. firm cannot make a decision about its optimal capital structure with the existing information.
- Answer: B Type: Concept Difficulty: Easy LO: 21.4

31. The Bay James Water Park and Lanudiere Resort Companies operate in a world with taxes and no financial distress. Bay James Water Park has a debt/equity ratio of 1. The cost of equity to Bay James Water Park is 15% and the cost of debt is 8 percent. The only difference between the Lanudiere Resort Company and Bay James Water Park is that Lanudiere Resort has a debt/equity ratio of 2. According to M&M, the cost of equity for Lanudiere Resort should be:
- A. Greater than the cost of equity for Bay James Water Park
 - B. The same as the cost of equity for Bay James Water Park
 - C. Less than the cost of equity for Bay James Water Park
 - D. Insufficient information provided to answer the question.
- Answer: A Type: Concept Difficulty: Easy LO: 21.4

32. The Bay James Water Park and Lanudiere Resort Companies operate in a world with taxes and no financial distress. Bay James Water Park has a debt/equity ratio of 1. The cost of equity to Bay James Water Park is 15 percent and the cost of debt is 8 percent. The only difference between the Lanudiere Resort Company and Bay James Water Park is that Lanudiere Resort has a debt/equity ratio of 2. According to M&M, the value of Lanudiere Resort should be:
- A. Greater than Bay James Water Park
 - B. The same as Bay James Water Park
 - C. Less than Bay James Water Park
 - D. Insufficient information provided to answer the question.
- Answer: A Type: Concept Difficulty: Easy LO: 21.4

33. The Bay James Water Park and Lanudiere Resort Companies operate in a world with taxes and no financial distress. Bay James Water Park has a debt/equity ratio of 1. The cost of equity to Bay James Water Park is 15 percent and the cost of debt is 8 percent. The only difference between the Lanudiere Resort Company and Bay James Water Park is that Lanudiere Resort has a debt/equity ratio of 2. According to M&M, the weighted average cost of capital for Lanudiere Resort should be:
- A. Greater than the weighted average cost of capital for Bay James Water Park
 - B. The same as the weighted average cost of capital for Bay James Water Park
 - C. Less than the weighted average cost of capital for Bay James Water Park
 - D. Insufficient information provided to answer the question.
- Answer: C Type: Concept Difficulty: Medium LO: 21.4

34. The Manitoba Flat Land (MFL) Company has a perpetual EBIT of \$10,000; an unlevered cost of equity of 5 percent, zero debt and faces a tax rate of 40 percent. The firm has 1,000 shares

outstanding. MFL issues \$5,000 of perpetual debt which pays interest of \$500 per year and uses the proceeds of the debt issue to repurchase stock. The change in the value of the firm is:

- A. No change in the value
- B. Increase by \$2,000
- C. Increase by \$3,000
- D. Increase by \$5,000

Answer: B Type: Calculation Difficulty: Easy LO: 21.4

How choices were determined:

- B. Debt * Tax rate
- C. Debt *(1-tax rate)
- D. Debt

35. Use the following statements to answer this question:

- I. In a perfect MM world with corporate taxes, WACC decreases linearly with the increase in debt in the company.
 - II. In a perfect MM world with corporate taxes, the slope of the WACC is proportional to debt.
- A. I and II are correct
 - B. I and II are incorrect
 - C. I is correct and II is incorrect
 - D. I is incorrect and II is correct

Answer: A Type: Concept Difficulty: Difficult LO: 21.4

36. Use the following statements to answer this question:

- I. Unlevered beta represents the systematic risk of the equity portion of the firm only.
 - II. The levered beta requires a linear adjustment with respect to debt to equity ratio.
- A. I and II are correct
 - B. I and II are incorrect
 - C. I is correct and II is incorrect
 - D. I is incorrect and II is correct

Answer: C Type: Concept Difficulty: Medium LO: 21.4

37. The Toronto Skaters Company (TSC) has a before tax cost of debt of 8 percent, a debt/equity ratio of 0, and pays tax at the rate of 40 percent. The unlevered cost of equity for a firm with TSC's risk characteristics is 15 percent. If TSC expects a perpetual EBIT of \$20,000 then the value of the firm is:

- A. \$43,478
- B. \$80,000
- C. \$133,333
- D. \$190,476

Answer: B Type: Calculation Difficulty: Medium LO: 21.4

$$k_e = 15\% + (15\% - 8\%) * (1 - .4) * 3 = 27.6\%$$

- A. . Value is $\$20,000 * (1 - .4) / .276 = \$43,478$
- B. $\$20,000 * (1 - .4) / .15 = \$80,000$

$$15\% = k_u + (k_u - k_d)(1 - T) * D / E = 2.8k_u - 14.4 \quad k_u = 10.5\%$$

D. , value is $\$20,000 / .105 = \$190,476$

38. The Bay James Water Park Company operates in a world with 15 percent taxes and no financial distress. The firm has a debt/equity ratio of 1. The cost of equity to Bay James Water Park is 20 percent and the cost of debt is 8 percent. The only difference between the Lanudiere Resort Company and Bay James Water Park is that Lanudiere Resort has a debt/equity ratio of 2. What is the cost of equity for Lanudiere Resort?

- A. 25.51%
- B. 11.20%
- C. 13.40%
- D. 14.49%

Answer: A Type: Calculation Difficulty: Difficult LO: 21.4

How choices were determined:

- A. $K_e = 14.49\% + (14.49\% - 8\%) * (1 - .15) * 2$
- B. $20\% * 1/3 + 8\% * (1 - .15) * 2/3$
- C. WACC of S = $20\% * 1/2 + 8\% * (1 - .15) * 1/2$
- D. $20\% = K_u + (K_u - 8\%) * (1 - .15) * 1/1$

39. The M&M Arb Co. has the following characteristics: perpetual EBIT of \$25,000, zero financial distress costs, unlevered cost of equity = 15%, cost of levered equity 20%, before tax cost of debt = 10% and the tax rate is 35%. If the value of M&M Arb Co is \$140,000 then the D/E ratio of M&M Arb is closest to:

- A. 0.2923
- B. 0.5473
- C. 1.8270
- D. 3.4211

Answer: C Type: Calculation Difficulty: Difficult LO: 21.4

How choices were determined:

- A. $(140,000 - 108,333) / 108,333 = 0.2923$
- B. $1 / 1.8270 = .5473$
- C. Value of unlevered: $\$25,000(1 - .35) / .15 = \$108,333$; $\$108,333 + D * (.35) = \$140,000$. $D = \$90,478$. $E = \$140,000 - 90,478 = \$49,522$. $D/E = 1.8270$
- D. $1 / .2923 = 3.4211$

Section 21.5 Financial Distress, Bankruptcy, and Agency Costs

40. In a world with corporate taxes and bankruptcy costs, the

- A. firm's value is unaffected by capital structure.
- B. firm should maximize its value by maximizing the firm's debt.
- C. firm should borrow to the point where the marginal benefits of debt equal the marginal costs.
- D. firm cannot make a decision about the optimal capital structure with the existing information.

Answer: C Type: Concept Difficulty: Easy LO: 21.5

41. Bankruptcy occurs when:

- I. A firm fails to pay interest on debt and the creditors enforce their legal rights
- II. A firm has insufficient assets to repay all the debt due in 10 years

- A. I only
- B. II only
- C. Both I and II will cause bankruptcy
- D. Neither I nor II will cause bankruptcy

Answer: A Type: Definition Difficulty: Easy LO: 21.5

42. The Board of Directors of a Canadian firm must:

- A. Act in the best interests of the company
- B. Always act in the best interests of the shareholders
- C. Always act in the best interests of all stakeholders including creditors
- D. Act in the best interests of the managers of the firm

Answer: A Type: Definition Difficulty: Medium LO: 21.5

43. Direct costs of bankruptcy do not include:

- A. Loss of tax losses
- B. Accounting and legal fees
- C. Agency costs
- D. All of the above are examples of direct costs of bankruptcy

Answer: C Type: Definition Difficulty: Easy LO: 21.5

44. Which one of the following is **not** a bankruptcy cost?

- A. The legal costs that the firm incurs in the bankruptcy process
- B. The risk premium increase in the bond yield
- C. The costs involved with managers hiding information from shareholders
- D. The damage to the company's trademark and intangible assets

Answer: C Type: Concept Difficulty: Medium LO: 21.5

45. The equity holders of a firm in financial distress have an incentive to:

- A. Accept poor risky projects which have some upside potential
- B. Forego maintenance
- C. Both of the above
- D. Neither of the above as these actions will reduce the overall value of the firm.

Answer: C Type: Concept Difficulty: Medium LO: 21.5

46. Which of the following is **not** an example of an agency problem?

- A. Firms are not as levered as shareholders would like them to be, due to fears of insolvency and possible bankruptcy.
- B. Managers have discretion over whether or not to pay the firm's earnings out to investors.
- C. Managers can maintain control over a greater free cash flow by avoiding debt in their firm's capital structures.
- D. Investors do not have perfect information about the value of their investments.

Answer: D Type: Concept Difficulty: Difficult LO: 21.5

47. According to the static tradeoff model of capital structure, in a world with taxes, firms have an incentive to:

- A. Issue debt as this will always reduce the weighted average cost of capital
- B. Issue debt until the benefits from the tax savings equals the costs of financial distress
- C. Maximize the amount of debt
- D. The static tradeoff model of capital structure does not exist.

Answer: B Type: Concept Difficulty: Difficult LO: 21.5

48. Which of the following statements is false?

- A. With zero taxes and zero bankruptcy costs, the value of the firm is independent of its debt equity ratio.
- B. With taxes and zero bankruptcy costs, the value of the firm reaches a maximum and then declines as the debt equity ratio increases.
- C. With taxes and bankruptcy costs, the value of the firm reaches a maximum and then declines as the debt equity ratio increases.
- D. All of the above are true

Answer: B Type: Concept Difficulty: Difficult LO: 21.5

49. Use the following statements to answer this question:

- I. Increasing a firm's debt can decrease the agency costs faced by shareholders.
- II. Agency costs affect only shareholders.

- A. I and II are correct
- B. I and II are incorrect
- C. I is correct and II is incorrect
- D. I is incorrect and II is correct

Answer: C Type: Concept Difficulty: Difficult LO: 21.5

Section 21.6 Other Factors Affecting Capital Structure

50. The pecking order theory of capital structure suggests that firms follow which order when raising capital?

- A. Internal cash flow, issue debt, issue equity
- B. Internal cash flow, issue equity, issue debt
- C. Issue debt, internal cash flow, issue equity
- D. Issue debt, issue equity, internal cash flow

Answer: A Type: Definition Difficulty: Easy LO: 21.6

51. The management of The Maritime Fisheries Company has just announced that they will be issuing stock to finance a positive net present value (NPV) project. The likely impact on the current stock price will be:

- A. An increase because the firm is investing in a positive NPV project
- B. No change – the market will only respond when the project's value is realized
- C. A decrease because the market will think that management is not telling the truth about the value of the project
- D. No change or a decrease because the market can't tell if the management is telling the truth about the project and the market suspects that the management thinks the stock price is overvalued

Answer: D Type: Concept Difficulty: Difficult LO: 21.6

52. Which one of the following theories about capital structure is based on agency cost?

- A. M&M proposition I
- B. Homemade leverage
- C. Pecking order
- D. Static tradeoff

Answer: C Type: Concept Difficulty: Medium LO: 21.6

Section 21.7 Capital Structure in Practice

53. According to the Deutsche Bank survey, rank the following reasons for capital structure:

- I. Credit rating
 - II. Ability to manage Earnings per Share
 - III. Transaction costs on debt issues
 - IV. Tax Shield
- A. I, II, IV, III
 - B. II, I, III, IV
 - C. I, IV, III, II
 - D. IV, III, II, I

Answer: C Type: Concept Difficulty: Medium LO: 21.7

54. Use the following statements to answer this question:

- I. Credit rating is the number one factor mentioned by most firms in the Deutsche Bank survey
 - II. Most firms in different countries are following a capital structure targeting strategy
- A. I and II are correct
 - B. I and II are incorrect
 - C. I is correct and II is incorrect
 - D. I is incorrect and II is correct

Answer: A Type: Concept Difficulty: Easy LO: 21.7

Section: Appendix 21-A Personal Taxes and Capital Structure

55. In a world with corporate and personal taxes but no bankruptcy costs,

- A. a firm's value is unaffected by capital structure.
- B. a firm should maximize its value by maximizing its debt.
- C. a firm should borrow to the point where the marginal benefits of debt equal the marginal costs.
- D. there are usually gains to firm value associated with the use of debt, but the gains are not as large as those predicted by M&M's corporate tax model.

Answer: D Type: Concept Difficulty: Medium LO: 21.7

56. Corporate and personal leverage may not be perfect substitutes because:

- I. The tax system is very complex and no conclusions can be drawn
- II. Investors must borrow at higher interest rates than corporations
- III. Investors are not protected by unlimited liability

- A. II only
- B. I and III

C. II and III

D. I and II

Answer: A Type: Concept Difficulty: Difficult LO: 21.7

Practice Problems

57. Give two reasons why an investor may NOT be able to undo a corporation's capital structure to achieve their desired level of leverage.

Type: Concept Difficulty: Medium LO: 21.3

Suggested Answer:

1. If investors cannot lend and borrow at the same rates as corporations, then there will be a distortion in the market.
2. Investors may be reluctant to assume the same amount of debt as corporations because investors are not protected by limited liability.

58. In a world with corporate taxes but no personal taxes and no risk of bankruptcy, what is a firm's ideal capital structure?

Type: Concept Difficulty: Medium LO: 21.4

Suggested Answer:

Since debt has a tax benefit (the interest tax shield), a firm increases in value as more debt is added to its capital structure. Therefore, the optimal capital structure in the absence of personal taxes and the risk of bankruptcy is 100 percent debt.

59. Explain the importance of debt in minimizing the agency cost problem between the managers and the shareholders.

Type: Concept Difficulty: Medium LO: 21.6

Suggested answer:

Managers have the tendency to pursue their own benefits at the expense of shareholders. When managers have less debt in the firm, they have the tendency to take on projects with poor performance since they have enough financial flexibility to do so. By increasing the level of debt, shareholders are obliging the managers to be more effective in their choices and less risk indulgent.

60. Explain the concept of M&M's homemade leverage and why it is not equivalent to a firm's debt.

Type: Concept Difficulty: Medium LO: 21.3

Suggested answer:

The homemade leverage concept refers to the possibility of a creating a portfolio that resembles a firm with levered equity by combining debt and equity at the investor level. This concept developed by M&M under the no tax world ignores the fact that firms can (and investors cannot) expense their interest which leads to a tax shield that increases the value of the firm.

61. If a corporation needs to raise money, where will it try to raise the funds? What is the order?

Type: Concept Difficulty: Easy LO: 21.5

Suggested Answer:

Companies who need to raise funds will do so in the following order:

1. First, management will look to internal funds to fund new projects.

2. Once internal funds have been exhausted, management will then issue more debt.
3. New common shares will only be issued when further issuance of debt is likely to substantially increase the chances of bankruptcy.

62. There are two companies, U and L, which are identical in every respect, except that U is financed entirely through common equity and L has \$100,000 debt at an interest rate of 16 percent. Both companies achieve annual net operating earnings of \$45,000. Assume perfect markets and information, with no taxes and no bankruptcy costs. If the market capitalizes firm U at a rate of 10 percent, and the total market value of L is \$500,000, is there an arbitrage opportunity available, and if so, what is the net gain?

Type: Calculation Difficulty: Medium LO: 21.3, 21.4, and 21.5

Suggested Answer:

The market value of U is $\$45,000 \div 0.10 = \$450,000$. This is less than the market value of L. Therefore, there is an arbitrage possibility. By shorting the equity and debt of L and buying the equity of U, we can make arbitrage profits.

Cost: short equity of L	=	-\$400,000
Short debt of L	=	- 100,000
Buy equity of U	=	+ 450,000
Net cash outflow	=	<u>\$ 50,000</u>
Annual transactions		
Payment on equity of L	=	-\$29,000
Payment of debt on L	=	- 16,000
Inflow from equity of U	=	+ 45,000
Net cash inflow	=	<u>\$ 0</u>

63. A company's capital structure is made up of 200,000 common shares and \$1,000,000 debt at 12 percent interest. The company's tax rate is 50 percent. An additional \$500,000 has to be raised, and the following financing alternatives are available:

Common shares: The Company can sell additional shares to net \$10 a share. Hence, 50,000 new shares would have to be issued.

Debt: Debt can be issued at 12 percent, requiring interest payments of \$60,000.

Compute EPS as a function of EBIT for both alternatives and derive the break-even point.

Type: Calculation Difficulty: Medium LO: 21.3, 21.4, and 21.5

Suggested answer:

Earnings per share for each alternative is computed as follows.

Common shares:

$$\text{EPS} = \frac{(1 - T)(\text{EBIT} - I_1)}{n_1 + n_2} = \frac{0.5(\text{EBIT} - 120,000)}{250,000}$$

Debt:

$$\text{EPS} = \frac{(1 - T)(\text{EBIT} - I_1 - I_2)}{n_1 + n_2} = \frac{0.5(\text{EBIT} - 180,000)}{200,000}$$

Note that the numerator represents the after-tax earnings, while the denominator is simply the number of common shares outstanding.

To find the break-even point, equate the EPS for the two alternatives and solve for the EBIT.

$$\frac{0.5 (\text{EBIT} - 120,000)}{250,000} = \frac{0.5 (\text{EBIT} - 180,000)}{200,000}$$
$$\text{EBIT} = \$420,000$$

If EBIT is below \$420,000, common shares would be favoured, but if EBIT is above \$420,000 debt would be favoured.

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Chapter 22: Dividend Policy

Multiple Choice Questions

Section 22.1 Dividend Payments

1. Place the following dates in chronological order from the earliest to the latest:

- I. Holder of record date
- II. Payment date
- III. Declaration date
- IV. Ex-dividend date

- A. III, I, II, IV
- B. III, IV, I, II
- C. I, III, II, IV
- D. IV, I, II, III

Answer: B Type: Definition Difficulty: Medium LO: 22.1

2. On January 1, 2009 you purchased 100 shares of the Toronto Skaters Company. On February 1, 2009 the company declared a dividend of \$2 per share for shareholders of record on March 15, 2009 payable on April 1, 2009. Assume the ex-dividend date is March 12, 2009. If you wished to receive the dividend, you can not sell your shares before:

- A. February 2, 2009
- B. March 12, 2009
- C. March 16, 2009
- D. April 2, 2009

Answer: B Type: Definition Difficulty: Easy LO: 22.1

3. Use the following statements to answer this question:

- I. DRIP is an investment plan that investors cannot chose to opt out from
- II. DRIP and stock dividends are exactly the same thing

- A. I and II are correct
- B. I and II are incorrect
- C. I is correct and II is incorrect
- D. I is incorrect and II is correct

Answer: B Type: Concept Difficulty: Easy LO: 22.1

4. Which of the following would result in a decrease in the number of shares outstanding and an increase in the earnings per share?

- A. Cash dividend
- B. Stock dividend
- C. Reverse stock split
- D. None of the above result in a decrease in the number of shares outstanding

Answer: C Type: Concept Difficulty: Easy LO: 22.1

5. With respect to a company paying a stock dividend, which of the following is false?

- A. The capital account remains unchanged.
- B. The overall value of the firm remains unchanged.
- C. The corporation distributes additional stock certificates.

D. There is no proportionate change in ownership.

Answer: A Type: Concept Difficulty: Medium LO: 22.1

6. Typically, when is the ex-dividend date?

A. The same as the payment date

B. The same as the declaration date

C. Prior to the record date

D. Announced when the dividend payment is announced

Answer: C Type: Definition Difficulty: Medium LO: 22.1

7. Which of the following is *not* a side effect of a stock dividend?

A. Investors may in the future receive a greater total cash dividend, as they now hold more stock.

B. Investors may ascribe an informational content to a stock dividend.

C. Investors pay the same amount of tax on stock dividends.

D. The stock price will increase.

Answer: D Type: Concept Difficulty: Medium LO: 22.1

8. The Toronto Skaters Company currently has 100,000 shares outstanding. It has just declared a 2 for 1 stock split. After the split, the number of shares outstanding will be:

A. 50,000

B. 100,000

C. 200,000

D. Cannot be determined without knowing the dollar value of the stock on the ex-dividend date.

Answer: C Type: Calculation Difficulty: Easy LO: 22.1

9. What is the most probable reason for stock splits?

A. The economic benefit for the firm

B. The increase in the number of shares where the price stays the same

C. Trading at an acceptable level for small investors

D. Trading at the penny stock level

Answer: C Type: Concept Difficulty: Medium LO: 22.1

10. The Toronto Skaters Company currently has 100,000 shares outstanding. It has just declared a 5 for 2 stock split. After the split, the number of shares outstanding will be:

A. 40,000

B. 100,000

C. 250,000

D. 500,000

Answer: C Type: Calculation Difficulty: Medium LO: 22.1

How choices were obtained:

A. $(2/5) * 100,000 = 40,000$

B. no change in number of shares outstanding

C. $(5/2) * 100,000 = 250,000$

D. $5 * 100,000 = 500,000$

11. Saguenay Resort Inc. and Gaspésie Spa Inc. both have 100,000 shares outstanding and both stocks trade for \$10 per share. Saguenay Resort Inc. pays a dividend of \$1 per share while Gaspésie Spa Inc. pays a 10% stock dividend. After the dividends are paid, the number of shares outstanding for Saguenay Resort Inc. and Gaspésie Spa Inc., respectively, are:

- A. 100,000; 100,000
- B. 90,000; 100,000
- C. 100,000; 110,000
- D. 110,000; 90,000

Answer: C Type: Concept Difficulty: Easy LO: 22.1

How choices were obtained:

- B. Saguenay Resort Inc. shares decreased by 10% dividend
- C. Gaspésie Spa Inc shares increased by 10% stock dividend
- D. Saguenay Resort Inc. shares increased by 10% dividend; Gaspésie Spa Inc shares decreased by 10% stock dividend

Section 22.2 Cash Dividends

12. Use the following statements to answer this question:

I. Dividends appear to be smoother than earnings because the economic cycle does not affect dividends the same way as earnings.

II. Dividend yields are very different across firms in Canada

- A. I and II are correct
- B. I and II are incorrect
- C. I is correct and II is incorrect
- D. I is incorrect and II is correct

Answer: D Type: Concept Difficulty: Medium LO: 22.2

Section 22.3 Modigliani and Miller's Dividend Irrelevance Theorem

13. Dividend policy would be irrelevant if which of the following was true?

- I. Capital gains and dividends were taxed equally
- II. Markets were strong-form efficient
- III. Transaction costs were negligible

- A. I
- B. III
- C. II and III
- D. I, II and III

Answer: D Type: Definition Difficulty: Easy LO: 22.3

14. The Toronto Skaters Company has cash flows from operations of \$100 million. Usually it pays a total annual dividend of \$100 million. In an M&M world, can reducing the dividend result in an increase in the value of the firm? Choose the best answer.

- A. No, according to M&M dividends are irrelevant so there should be no change in the value of the firm.
- B. No, in fact it will decrease value because shareholders like dividends more than capital gains.
- C. Yes, as long as the yield on the new investments the firm makes is greater than the return required by the shareholders.

D. Yes, because shareholders like capital gains more than dividends.

Answer: C Type: Concept Difficulty: Medium LO: 22.3

15. According to the residual theory of dividend:

A. Paying dividends would affect the value of the firm

B. Dividends would be as volatile as earnings

C. Dividends should be very smooth

D. Mature companies would pay higher dividends

Answer: D Type: Concept Difficulty: Medium LO: 22.3

16. The Northwest Territories Bikini Company has cash flows from operations of \$150 million and needs \$125 million for investment purposes. Assume the firm has 15 million shares outstanding and its shares are presently trading at \$15 per share. If the M&M conditions hold, what is the value of the firm after paying a \$3 per share dividend?

A. \$180 million

B. \$205 million

C. \$225 million

D. \$270 million

Answer: C Type: Calculation Difficulty: Easy LO: 22.3

How choices were determined:

A. $\$15 \times 15 \text{ million} - \$45 \text{ million} = \$180 \text{ million}$

B. $\$15 \times 15 \text{ million} - (\$45 \text{ million} - (\$150 \text{ million} - \$125 \text{ million})) = \$205 \text{ million}$

C. No change in value

D. Current value + \$45 million = \$270 million

17. The Northwest Territories Bikini Company has cash flows from operations of \$150 million and needs \$125 million for investment purposes. Assume the firm has 15 million shares outstanding and its shares are presently trading at \$15 per share. If the M&M conditions hold, how many new shares must be issued if the firm plans to pay a \$3 per share dividend?

A. 1.33 million shares

B. 1.46 million shares

C. 1.67 million shares

D. 3.00 million shares

Answer: B Type: Calculation Difficulty: Difficult LO: 22.3

How choices were determined:

A. $(20 \text{ million} / \$15) = 1.33 \text{ million shares}$

$$\begin{aligned} nP_1 &= 15\text{million} * \$3 - (150\text{million} - 125\text{million}) = \$20\text{million} \\ P_1 &= \frac{V}{m+n} = \frac{225\text{million}}{15\text{million} + n} = \$13.6667 \\ n &= \$20\text{million} / \$13.6667 = 1,463,415 \end{aligned}$$

C. $(\$25\text{million} / \$15) = 1.67 \text{ million}$

D. $(\$45\text{million} / \$15) = 3 \text{ million}$

18. The Northwest Territories Bikini Company has cash flows from operations of \$150 million and needs \$125 million for investment purposes. Assume the firm has 15 million shares outstanding and its shares are presently trading at \$15 per share. If the M&M conditions hold, what is the price per share of the firm after paying a \$3 per share dividend?

- A. \$18
- B. \$15
- C. \$13.67
- D. \$12

Answer: C Type: Calculation Difficulty: Difficult LO: 22.3

How choices were determined:

- A. $\$15 + \$3 = \$18$

$$nP_1 = 15\text{million} * \$3 - (150\text{million} - 125\text{million}) = \$20\text{million}$$

$$P_1 = \frac{V}{m+n} = \frac{225\text{million}}{15\text{million} + n} = \$13.6667$$

- D. Current price – dividend = $\$15 - \$3$

Section 22.4 The “Bird in the Hand” Argument

19. The model that states, all else equal, dividend-paying companies are less risky than non-dividend-paying companies is called:

- A. Residual dividend model
- B. Modigliani and Miller dividend irrelevance model
- C. The bird-in-the-hand model
- D. The signalling model

Answer: C Type: Definition Difficulty: Easy LO: 22.4

20. The Modigliani and Miller dividend irrelevance theorem is based on the argument that:

- A. Dividends are preferred to capital gains
- B. Dividends and capital gains are perfect substitutes
- C. Capital gains are preferred to dividends
- D. Investors don’t value dividends, hence dividends are irrelevant

Answer: B Type: Concept Difficulty: Medium LO: 22.4

21. The “bird in the hand” argument is based on the argument that:

- A. Dividends are preferred to capital gains
- B. Dividends and capital gains are perfect substitutes
- C. Capital gains are preferred to dividends
- D. Investors don’t value dividends, hence dividends are irrelevant

Answer: A Type: Concept Difficulty: Medium LO: 22.4

22. What is the major argument that supports the “bird in hand theory”?

- A. There is no difference between dividend yields and capital gains

- B. The risk profile of the firm depends on the risk of its cash flows not its dividends
- C. Present value of growth opportunities are more volatile, hence increase the risk of the firm
- D. Dividends payments signal a good standing of the firm

Answer: C Type: Concept Difficulty: Medium LO: 22.4

Section 22.5 Dividend Policy in Practice

23. The empirical evidence suggests that (choose best statement):

- A. Firms follow a residual dividend policy
- B. Firms follow a constant dividend payout policy
- C. Firms follow a constant dividend amount policy
- D. Firms follow a random dividend amount policy

Answer: C Type: Concept Difficulty: Easy LO: 22.5

24. What does the Lintner empirical model suggest?

- A. Firms rapidly adjust their dividends to changing economic conditions.
- B. Firms pay out a constant proportion of their earnings as dividends.
- C. Dividends are very sticky (i.e., they do not change frequently).
- D. A and B are correct

Answer: C Type: Concept Difficulty: Medium LO: 22.5

25. Use the following statements to answer this question:

- I. The Lintner equation shows that the relationship between past and current dividends exists
 - II. "Stickiness" of dividends contradicts with the M&M irrelevance theory
- A. I and II are correct
 - B. I and II are incorrect
 - C. I is correct and II is incorrect
 - D. I is incorrect and II is correct

Answer: A Type: Concept Difficulty: Medium LO: 22.5

Section 22.6 Relaxing the M&M Assumptions: Welcome to the Real World!

26. The Toronto Skaters Company has just declared its regular dividend of \$1 per year. On March 1, the stock traded at \$5 per share. The next day, the ex-dividend date, what do we expect to see?

- A. The stock price fall by \$1.
- B. The stock price fall by less than \$1 due to investor taxes.
- C. The stock price rise by \$1.
- D. The stock price rise by less than \$1 due to investor taxes.

Answer: B Type: Concept Difficulty: Easy LO: 22.6

27. Which of the following has a positive impact on the share price?

- A. Unexpected dividend increase
- B. Unexpected dividend decrease
- C. Unexpected stock dividend
- D. None of the above is expected to have a positive impact on share prices

Answer: A Type: Concept Difficulty: Easy LO: 22.6

28. Management will increase dividends when:

- A. it is sure the increased payments can be sustained.
- B. it has an exceptionally successful year.
- C. it believes the stock is underpriced.
- D. earnings have fallen over the past few years.

Answer: A Type: Concept Difficulty: Medium LO: 22.6

29. If management wishes to distribute some portion of the firm's increased earnings, but does not want to raise false expectations, it will distribute a(n) _____ dividend.

- A. additional
- B. special
- C. non-regular
- D. unrepeatable

Answer: B Type: Concept Difficulty: Medium LO: 22.6

30. An investor will prefer a high dividend if:

- I. the firm cannot reinvest the funds in projects where the yields exceed those that a shareholder could get elsewhere.
- II. the investor needs a high level of current income.
- III. the investor faces high personal taxes.

- A. I only
- B. II only
- C. I and II
- D. I and III

Answer: C Type: Concept Difficulty: Easy LO: 22.6

31. An investor will prefer a low dividend if:

- I. the firm cannot reinvest the funds in projects where the yields exceed those that a shareholder could get elsewhere.
- II. the investor needs a high level of current income.
- III. the investor faces high personal taxes.

- A. I only
- B. III only
- C. I and II
- D. II and III

Answer: B Type: Concept Difficulty: Easy LO: 22.6

32. Which of the following would impact management's decision regarding the proportion of earnings to be paid out in dividends and the proportion to be retained for reinvestment?

- A. Investors' reinvestment opportunities.
- B. Tax considerations.
- C. The firm's reinvestment opportunities.
- D. All of the above

Answer: D Type: Concept Difficulty: Medium LO: 22.6

Section 22.7 Share Repurchases

33. Which of the following is not a motivation for a share repurchase?

- A. Offsetting the exercise of executive stock options.
- B. Repurchase of dissident shares.
- C. Pay free cash flows to shareholders without generating an expectation of continued dividends.
- D. To indicate that the management feels the stock is overvalued.

Answer: D Type: Concept Difficulty: Easy LO: 22.7

34. Use the following two statements to answer this question:

- I. Managers only repurchase stocks to take advantage of the underpricing of the stocks
- II. Stock repurchases are exactly the same as cash dividends in the real world.

- A. I and II are correct
- B. I and II are incorrect
- C. I is incorrect and II is correct
- D. I is correct and II is incorrect

Answer: B Type: Concept Difficulty: Medium LO: 22.7

Practice Problems

35. Describe the similarities and differences between stock dividends and dividend reinvestment plans.

Type: Concept Difficulty: Easy LO: 22.1

Suggested answer:

- A dividend reinvestment plan gives shareholders the option of receiving stock instead of cash dividends. The advantage to the shareholder is that he or she will not have to pay brokerage fees or transactions costs in acquiring the stock.
- In contrast, with a stock dividend the investor has no choice, the firm will give them stock.
- In both cases, the number of shares outstanding increases.

36. Explain the concept of homemade dividend and how it affects the value of the firm.

Type: Concept Difficulty: Easy LO: 22.3

Suggested answer:

The homemade dividend principle assumes that an investor is completely indifferent to the dividend policy of the firm in which she holds shares because she can reinvest the proceeds of dividends in the firm or sell assets of the company when she needs the income. This principle does not assume any effects of market risk, transaction costs or taxation treatment of different scenarios.

37. Evaluate the following statement: “If a firm has a number of positive NPV projects, it can cut its dividend so that it is not passing up good opportunities.”

Type: Concept Difficulty: Medium LO: 22.6

Suggested answer:

In practice, firms tend to follow a policy of providing stable dividends. The market tends to react negatively to decreases in the firm's dividend. Managers know this and avoid unnecessary fluctuations wherever possible. The dividend has an informational effect, and a decrease would give the market the message that the firm is on the brink of financial distress.

38. How is a stock repurchase related to the dividend decision? What is the impact on earnings per share?

Type: Concept Difficulty: Medium LO: 22.7

Suggested Answer:

Stock repurchases are an alternative to cash dividends. The company can offer to buy back a certain proportion of outstanding shares on a pro rata basis. The number of shares outstanding decreases and as a consequence the earnings per share increases. The stock price also increases and shareholders receive the “dividend” in the form of a capital gain.

39. Montreal Trust Corp. is facing reduced earnings. Its entire industry has been facing declining demand due to a severe recession; however its stock price has suffered more than the stock price of its competitors. The market believes that it is fundamentally weaker than its competitors. Montreal Trust’s CEO has decided to prop up the stock price by increasing its dividend. He believes that, according to the Dividend Discount Model (DDM), if Montreal Trust increases its dividend, then its stock price will rise. Why won’t this work?

Type: Concept Difficulty: Difficult LO: 22.5

Suggested answer (Note: this suggested answer incorporates material from other chapters)

The DDM states that the stock price is the present value of all future *expected* dividends. If Montreal Trust pays out a dividend that is too high today, it is either reducing its ability to internally generate funds to *reinvest* in *positive NPV* projects, or it is draining the firm’s equity, or both. In both cases, it is *reducing its future expected dividends* by reducing its ability to generate dividends in the future. Therefore there will be no impact on the price of the firm.

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Chapter 23: Working Capital Management: General Issues

Multiple Choice Questions:

Section 23.1 An Integrated Approach to Net Working Capital (NWC) Management

1. The correct measure of the cash generating ability of a firm is:

- A. Working capital
- B. Cash flow from operations
- C. Account receivables
- D. Net income

Answer: B Type: Concept Difficulty: Easy LO: 23.1

2. On April 1 Montreal Salsa Dance School had \$1,750 in cash, and no receivables or payables. It also had 100 students whose classes finished on April 30th. Thirty-five of those students paid their tuition of \$500 on time (April 30th). During the month the school incurred costs associated with its operations; instructor salaries \$25,000, rent \$4,000, and \$1,000 utilities. If the school's policy of paying all bills in cash at the end of each month is respected how much does the school have to borrow to pay its bills?

- A. \$30,000
- B. \$12,500
- C. \$10,750
- D. \$0

Answer: C Type: Calculation Difficulty: Easy LO: 23.1

$$\boxed{\$25,000 + \$4,000 + \$1,000 = \$30,000}$$

$$\boxed{\$25,000 + \$4,000 + \$1,000 = \$30,000}$$

B. ; $(35 * \$500) = \$17,500$;

$$\boxed{\$25,000 + \$4,000 + \$1,000 = \$30,000}$$

C. ; $(35 * \$500) + \$1,750 = \$19,250$;

$$\boxed{\$25,000 + \$4,000 + \$1,000 = \$30,000}$$

D. ; $(100 * \$500) = \$50,000$;

$\$50,000 - \$30,000 = \$20,000 = \$0$

3. Why are cash budgets important?

- A. Forecasts cash inflows and outflows
- B. Forecasts cash sales
- C. Forecasts the impact of cash inflows and outflows on the firm's cash balances
- D. A and C

Answer: D Type: Concept Difficulty: Medium LO: 23.1

4. Why do banks require that business loan applications be accompanied by cash budgets?

- A. To determine how much cash to loan
- B. To determine whether the loan will be a short-term or long-term loan.
- C. To determine whether the business will be profitable
- D. To calculate the expected return it receives from giving the loan

Answer: B Type: Concept Difficulty: Medium LO: 23.1

5. Which of the following is a reason why a very profitable company might go bankrupt?

- A. Managers are not forecasting sales correctly
- B. Profits do not include the real costs of the business
- C. Lack of cash to finance activities
- D. Profits are inflated using some accounting method.

Answer: C Type: Concept Difficulty: Medium LO: 23.1

Section 23.2 An Integrated Approach to Net working Capital (NWC) Management

6. Which of the following is not a key component of a cash budget?

- A. Estimated production schedules
- B. Sales forecasts
- C. Estimates of the size and timing of other cash inflows and outflows
- D. Cash sales

Answer: D Type: Concept Difficulty: Easy LO: 23.2

7. In the event that a business' cash budget forecasts a cash deficit for a short future period of time, what should be done?

- A. Close the business, as it is unprofitable.
- B. Arrange for some short-term borrowing around the expected time of the deficit.
- C. Try to make the cash forecast positive by decreasing / cutting costs somehow.
- D. Change the credit granting policy of the business.

Answer: B Type: Concept Difficulty: Medium LO: 23.2

8. The break-even sales growth rate is defined as:

- A. The sales growth rate at which a firm makes profits
- B. The sales growth rate of return on a firm's investment
- C. The sales growth rate that makes the monthly cash flow from operations equal zero.
- D. The sales growth rate at which investors break-even

Answer: C Type: Definition Difficulty: Easy LO: 23.3

9. Which of the following is not a component of a firm's credit granting policy?

- A. How to collect payments
- B. How to manage bad debt
- C. How to monitor receivables
- D. How to extend credit

Answer: B Type: Definition Difficulty: Medium LO: 23.2

10. A firm's payment policy is concerned with

- A. When the firm pays its bills
- B. How the firm pays its bills (examples: cheques, electronic fund transfer)

- C. Which bills the firm pays
- D. All of the above

Answer: A Type: Definition Difficulty: Easy LO: 23.2

11. All of the following are important warning signs indicating potential liquidity problems, except:

- A. build-up of long-term assets
- B. increases in net working capital
- C. increases in accounts receivable
- D. increase in debt ratios

Answer: A Type: Concept Difficulty: Medium LO: 23.2

12. A firm's inventory policy concerns

- A. What the firm does with its inventory
- B. What kind of inventory the firm buys
- C. The amount of inventory to hold
- D. Where the firm holds its inventory

Answer: C Type: Definition Difficulty: Easy LO: 23.2

13. A firm's credit policy concerns

- A. What the firm does with its loans
- B. What the firm does with its bad debt
- C. The amount of inventory to hold
- D. when the firm collects its receivables

Answer: D Type: Definition Difficulty: Easy LO: 23.2

Section 23.3 Analyzing Cash Inflows and Outflows

14. A firm can grow faster if it:

- A. maximizes prices, minimizes production costs, maximizes the time between collection and payment, and minimizes inventory
- B. maximizes cash sales, minimizes production costs, maximizes the time between payment and collection, and minimizes inventory
- C. maximizes gross margin, minimizes production costs, maximizes the time between collection and payment, and minimizes inventory
- D. maximizes its growth rate, minimizes production costs, maximizes the time between payment and collection, and minimizes inventory

Answer: C Type: Concept Difficulty: Difficult LO: 23.3

15. Which one of the following is/are true?

- A. The change in cash position is a linear relationship to the production.
- B. If the sales are lower than the sales growth breakeven point the firm will run out of working capital.
- C. As the level of inventory increases, the required sales growth increases as well.
- D. All of the above is true.

Answer: D Type: Concept Difficulty: Medium LO: 23.3

16. The Montreal Skaters Corp. collects 10% of its monthly sales immediately and the rest a month later. Its production costs are 70% of sales. It holds 1 month of sales in inventory, and it pays half its bills immediately and half after 30 days. What is this firm's break even sales growth rate?

- A. 78.65%
- B. 71.43%
- C. 31.58%
- D. 10.00%

Answer: C Type: Calculation Difficulty: Medium LO: 23.3

How each choice is determined:

A. $g = 0.70.90.5 + 0.6 - 0.1 = 78.65\%$

$$g = \frac{1 - 0.7}{0.7(0.5 + 1) - 0.1} = 31.58\%$$

C.

$$g = 1 - 0.70.70.5 + 0.6 - 0.1 = 44.78$$

D. Percentage of collections

E.

F. 17. The Montreal Skaters Corp. collects 35% of its monthly sales immediately and the rest a month later. Its production costs are 65% of sales. It holds 1 month of sales in inventory, and it pays half its bills immediately and half after 30 days. What is this firm's break even sales growth rate?

G. A. 200.0%

H. B. 46.8%

I. C. 56.0%

J. D. 104.0%

K. Answer: C Type: Calculation Difficulty: Medium LO: 23.3

L.

$$\frac{(1 - .65)}{[(1 - .65) * (0.50 + 1) - .35]} = 2.0 = 200\%$$

N. A.

$$\frac{(1 - .65)}{[0.65 * ((0.50 + 1) - .35)]} = 0.4682 = 46.8\%$$

O. B.

$$\frac{(1 - 0.65)}{[0.65 * (0.50 + 1) - .35]} = 0.56 = 56\%$$

P. C.

$$\frac{(0.65)}{[0.65 * (0.50 + 1) - .35]} = 1.04 = 104\%$$

Q. D.

R.

S. 18. Which of the following relationships is not true?

T. A. The break-even sales growth rate is inversely related to the inventory level.

U. B. The break-even sales growth rate is inversely related to the gross margin.

V. C. The break-even sales growth rate is inversely related to the payables rate.

W. D. The break-even sales growth rate is positively related to the collection rate.

X. Answer: B Type: Concept Difficulty: Difficult LO: 23.3

Y.

Z. 19. Cash flow from operations does not

AA. A. Increase when the collection rate on receivables rises

AB. B. Increase when the bill payments are made quicker.

AC. C. Increase when the inventory turnover ratio increases.

AD. D. Decrease when the production costs rise.

AE. Answer: B Type: Concept Difficulty: Difficult LO: 23.3

AF.

AG. 20. Use the following statements to answer this question:

AH. I. Delaying payment of payables can create a buffer for the firm to keep its working capital.

AI. II. If the firm cannot change its credit, payment and inventory policy, it has to slow growth to survive.

AJ. A. I and II are correct

AK. B. I and II are incorrect

AL. C. I is correct and II is incorrect

AM. D. I is incorrect and II is correct

AN. Answer: A Type: Concept Difficulty: Medium LO: 23.3

AO.

AP. **Section 23.4 Working Capital Management**

AQ.21. What are two common measures of liquidity?

AR. A. Cash ratio and inventory turnover ratio

AS. B. Receivables turnover ratio and payables turnover ratio

AT. C. Current ratio and quick ratio

AU. D. Inventory turnover ratio and cash conversion rate

AV. Answer: C Type: Concept Difficulty: Easy LO: 23.4
AW.

AX. 22. A good value for the quick ratio is

- AY. A. 1
- AZ. B. Varies from company to company
- BA. C. 2
- BB. D. Varies from industry to industry

BC. Answer: D Type: Concept Difficulty: Medium LO: 23.4
BD.

BE. 23. A firm with a high liquidity ratio is practicing effective working capital management.
This statement is:

- BF. A. True, higher liquidity ratio means that the firm has more cash than it spends.
- BG. B. False, higher liquidity means payables are paid much later than receivables and this hurts the firm's reputation
- BH. D. True, higher liquidity ratio means receivables are greater than payables.
- BI. D. False, the firms' working capital management policy may be too conservative or too lenient

BJ. Answer: D Type: Concept Difficulty: Medium LO: 23.4
BK.

BL. 24. The average collection period measures

- BM. A. How long it takes the average customer to pay bad debt
- BN. B. How long the firm waits before asking customers to pay
- BO. C. How long the firm allows the customers to not pay
- BP. D. How long it takes the average customer to pay

BQ. Answer: D Type: Definition Difficulty: Medium LO: 23.4
BR.

BS. 25. The manager of your receivables' department states that the firm's accounts receivables turn over 25 times per year. What does this mean?

- BT. A. It takes about 25 days, on average, for customers to pay for their orders
- BU. B. It takes about 15 days, on average, for customers to pay for their orders
- BV. C. It takes about 2 days, on average, for customers to pay for their orders
- BW. D. None of the above

BX. Answer: B Type: Concept Difficulty: Medium LO: 23.4
BY.

BZ. How choices were determined:

- CA. A. It takes about 25 days, on average, for customers to pay for their orders
- CB. B. $365/25 = 14.6$
- CC. C. $(25/365)*30 = 2.05$
- CD. D. None of the above

CE.

CF. 26. The inventory turnover ratio is defined as:

- CG. A. The ratio of cost of goods sold to sales
- CH. B. A ratio measuring the sales that are generated per dollar of receivables
- CI. C. A ratio measuring how fast inventory is paid for

- CJ. D. A ratio of average sales to average inventory
- CK. Answer: D Type: Definition Difficulty: Medium LO: 23.4
- CL.
- CM. 27. Why is it better to use sales rather than cost of goods sold when calculating the average days sales in inventory value?
- CN. A. The values for COGS are not always comparable across firms
- CO. B. COGS is not the driving variable behind the accumulation of inventory
- CP. C. Inventory is accumulated regardless of its COGS
- CQ. D. There are three types of COGS, raw material, work in progress, and finished goods, and since all are slightly different using one or the other would make the calculations inaccurate.
- CR. Answer: A Type: Concept Difficulty: Difficult LO: 23.4
- CS.
- CT. 28. Use the following statements to answer this question:
- CU. I. The quick ratio is more conservative than the current ratio because it covers a smaller period of time.
- CV. II. The cost of goods sold figure in the inventory turnover ratio is not always reliable because of the accounting differences used in measuring it.
- CW. A. I and II are correct
- CX. B. I and II are incorrect
- CY. C. I is correct and II is incorrect
- CZ. D. I is incorrect and II is correct
- DA. Answer: D Type: Concept Difficulty: Medium LO: 23.4
- DB.
- DC. 29. The payables turnover ratio concerns:
- DD. A. Accounts receivable
- DE. B. Long-term liabilities
- DF. C. Bad debts
- DG. D. Current liabilities
- DH. Answer: D Type: Concept Difficulty: Easy LO: 23.4
- DI.
- DJ. 30. The operating cycle is defined as:
- DK. A. The amount of time it takes firms to acquire inventory, sell it and receive payment
- DL. B. The amount of time it takes to convert raw materials into finished goods
- DM. C. The amount of time it takes to generate profit from operations
- DN. D. The amount of time it takes a firm to sell its inventory and receive payment
- DO. Answer: A Type: Definition Difficulty: Medium LO: 23.4
- DP.
- DQ. 31. The two components of the operating cycle are:
- DR. A. Average days of sale + average collected payment
- DS. B. Average days of sales in inventory + average collected payment
- DT. C. Average days of sale + average collection period
- DU. D. Average days of sales in inventory + average collection period
- DV. Answer: D Type: Definition Difficulty: Difficult LO: 23.4
- DW.

- DX.32. For a given operating cycle, a firm estimates the amount of financing it requires by
- DY. A. Calculating the expected profit from sales over the operating cycle
- DZ. B. Calculating the total expected sales over the operating cycle
- EA. C. Calculating the longest period it can possibly obtain to fulfill its payables
- EB. D. Calculating the longest period it can possibly grant for customers' payables
- EC. Answer: C Type: Concept Difficulty: Difficult LO: 23.4
- ED.

- EE.33. The cash operating cycle allows firms to estimate
- EF. A. the average time between when a firm pays cash for its inventory purchases and when it receives cash for its sales
- EG. B. Average time a firm must keep any borrowed funds
- EH. C. the average time required for a firm to acquire inventory, sell it, and collect the proceeds
- EI. D. The amount of cash a firm needs to be profitable
- EJ. Answer: C Type: Concept Difficulty: Difficult LO: 23.4
- EK.

- EL.34. The cash conversion cycle allows firms to calculate
- EM. A. The amount of cash they need to operate
- EN. B. How long a firm must keep any borrowed funds
- EO. C. How long a firm needs to borrow money for
- EP. D. The amount of cash a firm needs to be profitable
- EQ. Answer: C Type: Concept Difficulty: Difficult LO: 23.4
- ER.

- ES.35. Firms can grow faster and decrease their cash conversion cycle by doing all of the following except:
- ET. A. Delay paying bills
- EU. B. Increase its inventory turnover
- EV. C. Reduce collection time
- EW. D. Reduce production costs
- EX. Answer: D Type: Concept Difficulty: Difficult LO: 23.3
- EY.

EZ. **Practice Problems**

FA.36. Illustrate and clearly explain how profitable businesses can become bankrupt due to the mismanagement of their working capital. In your explanation, define what working capital is, along with its two main components, as well as the difference between cash flow and profits. Finally, describe how businesses can mitigate this problem of going broke while still being technically profitable.

FB. Type: Concept Difficulty: Medium LO: 23.1

FC. Suggested answer:

FD. Working capital is the difference between a firm's current assets and its current liabilities. Cash flow represents the cash generated by the firm, whereas profits are determined by using generally accepted accounting principles, which include many non-cash items. Profitable businesses can become bankrupt due to the mismanagement of their working capital when their short-term cash outflows exceed their short-term cash

inflows and they must resort to short-term borrowing to alleviate the problem. If borrowing is not possible, the business is technically bankrupt due to its inability to fulfill its financial obligations.

FE.

FF. 37. Explain the impact of the last financial crisis on small businesses.

FG. Type: Concept Difficulty: Medium LO: 23.1

FH. Suggested answer:

FI. Small businesses rely on the banking system to raise funds for their working capital. After the failure of Lehman Brothers in September 2008, the banking system became constrained, preventing banks from financing many small businesses. These businesses were profitable but the cost of borrowing increased tremendously and the scarcity of funds worsened the situation.

FJ.

FK. 38. Explain what the break-even sales growth rate means and what impact it has on the development of a firm's operations and credit granting (financial) policy.

FL. Type: Concept Difficulty: Medium LO: 23.3

FM. Suggested answer:

FN. The break-even sales growth rate is the sales growth rate that makes the monthly cash flow from operations equal to zero. As long as a firm's sales growth rate is equal to this value it generates cash, and when its sales growth rate falls below the break-even rate, it needs cash. The break-even sales growth rate is important for the development of a firm's operational and credit policy because higher sales growth often creates an external financing need. As such, firms may need to adjust their credit policies according to their projected sales growth, in order to not be forced to borrow while also having much of their own cash tied up in receivables.

FO.

FP. 39. You recently overheard your boss stating that, "our company's high growth rate is making it difficult for us to keep the business open, and we're frequently forced to rely on bank loans to keep us from going bankrupt." This statement confused you: isn't a high growth rate a good thing to have? Clearly explain why or why not and discuss how firms with a problem such as yours resolve their dilemma.

FQ. Type: Concept Difficulty: Difficult LO: 23.3

FR. Suggested answer:

FS. In and of itself, having a high growth rate is never a disadvantage to any firm. However, having a high growth rate will become problematic when a firm fails to manage its credit policy, along with its payment and inventory policies. For instance, if a rapidly growing firm grants longer credit terms to its customers than it receives, its payables will mature earlier than its receivables and force the firm to borrow in order to fulfill its obligations. Additionally, if the firm does not monitor its receivables diligently or does not have a proper collection system, the firm will not be able to survive due to its lack of cash. Finally, a high growth rate will affect the firm's inventory policy. In order to survive, a firm with a high growth rate must manage its inventory carefully, making sure to keep as little inventory as possible (without leading to a threat of a shortage) as well as turning its inventory over as fast as possible. Therefore, for a given sales growth rate, the firm's

main levers for growing faster are to collect its invoices quicker than it pays its bills and reduce its stock of inventory.

FT.

FU.40. The Montreal Bagel Bakery collects 35% of its monthly sales immediately and the rest a month later. Its production costs are 65% of sales. It holds 1 month of sales in inventory, and it pays half its bills immediately and half after 30 days. Calculate the cash conversion cycle and the operating cycle for the Montreal Bagel Bakery.

FV. Type: Concept Difficulty: Difficult LO: 23.4

FW. Suggested answer:

FX. Average collection period (ACP) = $0 \cdot .35 + 30 \cdot .65 = 19.5$ days

FY. Average days revenues in inventory (ADRI) = 30 days

FZ. Average days revenues in payables (ADRP) = $.5 \cdot 0 + .5 \cdot 30 = 15$ days

GA. Operating cycle (OC) = ADRI + ACP = $30 + 19.5 = 49.5$ days

GB. Cash conversion cycle (CCC) = OC – ADRP = $49.5 - 15 = 34.5$ days

GC.

GD.41. The Montreal Bagel Bakery collects 45% of its monthly sales immediately and the rest a month later. Its production costs are 60% of sales. It holds 1 month of sales in inventory, and it pays half its bills immediately and half after 30 days. Calculate the cash conversion cycle and the operating cycle for the Montreal Bagel Bakery.

GE. Type: Concept Difficulty: Difficult LO: 23.4

GF. Suggested Answer:

GG. Average collection period (ACP) = $0 \cdot .45 + 30 \cdot .55 = 16.5$ days

GH. Average days revenues in inventory (ADRI) = 30 days

GI. Average days revenues in payables (ADRP) = $.5 \cdot 0 + .5 \cdot 30 = 15$ days

GJ. Operating cycle (OC) = ADRI + ACP = $30 + 16.5 = 46.5$ days

GK. Cash conversion cycle (CCC) = OC – ADRP = $46.5 - 15 = 31.5$ days

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GY.

Chapter 24: Working Capital Management: Current Assets and Current Liabilities**Multiple Choice Questions:****Section 24.1: Cash and Marketable Securities**

1. Which is not one of the reasons why firms hold cash?

- A. In case good deals arise
- B. To finance major outlays
- C. To enjoy returns on investment
- D. To handle emergencies

Answer: C Type: Concept Difficulty: Easy LO: 24.1

2. Which of the following pairs does not include a motive for holding cash?

- A. Transactions motive and speculative motive
- B. Precautionary motive and transaction motive
- C. Speculative motive and finance motive
- D. Transactions motive and operating motive

Answer: D Type: Concept Difficulty: Medium LO: 24.1

3. The transactions motive refers to

- A. The motive to hold cash that is required for a firm's normal operations
- B. The motive to hold cash that is required for purchases
- C. The motive to hold cash that is required for a firm's long-term purchases
- D. The motive to hold cash that is required for emergencies

Answer: A Type: Definition Difficulty: Medium LO: 24.1

4. The precautionary motive refers to

- A. A firm's motive to hold securities in case of emergencies
- B. A firm's motive to hold cash in case of emergencies
- C. A firm's motive to hold cash for insurance purposes
- D. A firm's motive to hold cash to pay for damages

Answer: B Type: Definition Difficulty: Easy LO: 24.1

5. Which of the four motives for holding cash do firms cite when planning for major outlays?

- A. Speculative motive
- B. Precautionary motive
- C. Transactions motive
- D. Finance motive

Answer: D Type: Definition Difficulty: Easy LO: 24.1

6. The term "cash on hand" refers to:

- A. cash in the current account
- B. cash in marketable securities
- C. None of the above
- D. A and B

Answer: D Type: Definition Difficulty: Medium LO: 24.1

7. To be included in “cash on hand” cash must be:

- A. Available instantaneously
- B. Available almost instantaneously
- C. Next day available
- D. Available for borrowing immediately

Answer: B Type: Concept Difficulty: Easy LO: 24.1

8. Investments in short-term marketable securities are categorized as:

- A. Operational investments
- B. Speculative investments
- C. Strategic investments
- D. Near-cash investments

Answer: D Type: Definition Difficulty: Medium LO: 24.1

9. Which of the following is not an example of a near-cash item?

- A. Treasury Bonds
- B. Commercial Paper
- C. Treasury Bills
- D. Bankers' Acceptance

Answer: A Type: Concept Difficulty: Medium LO: 24.1

10. What is the optimal amount of cash a firm should hold?

- A. As much as possible
- B. Just enough to pay for purchases
- C. Enough to be liquid
- D. None

Answer: C Type: Concept Difficulty: Difficult LO: 24.1

11. What determines the optimum amount of cash a firm should hold?

- A. The motives for the use of the cash
- B. The firm's borrowing capacity
- C. A and B
- D. None of the above determines the optimum amount of cash a firm should hold

Answer: C Type: Concept Difficulty: Medium LO: 24.1

12. Why might firms prefer to hold more liquidity in borrowing facilities rather than raising capital from shareholders?

- A. Firms can obtain more capital from borrowing
- B. Obtaining the money is faster via borrowing
- C. Borrowing is often cheaper
- D. Firms would like to avoid paying dividends to investors

Answer: C Type: Concept Difficulty: Medium LO: 24.1

13. Which of the following scenarios is an example of the transactions motive to hold cash?

- A. An oil company saves abnormally high earnings as cash on its balance sheet which it will use to buy another oil company.

- B. A manufacturing company holds cash to pay its suppliers for raw materials.
- C. An airline keeps a reserve of cash during the winter months in case it has to pay customers a refund because bad weather results in a cancellation of flights.
- D. A firm holds cash to pay its annual dividend.

Answer: B Type: Concept Difficulty: Easy LO: 24.1

14. Which of the following scenarios is an example of the speculative motive to hold cash?

- A. An oil refining company holds cash to make special purchases of petroleum if the price temporarily drops below a predetermined level.
- B. A government holds cash to make interest payments on its bonds.
- C. A small business holds cash which it will use to purchase equipment at the end of the year.
- D. A firm holds cash to pay its employees wages.

Answer: A Type: Concept Difficulty: Easy LO: 24.1

15. Which of the following scenarios is an example of the precautionary motive to hold cash?

- A. A retailer holds a reserve of cash in case customers return products for a cash refund.
- B. A bank holds cash on deposit for its customers.
- C. A car dealership holds cash to pay its utility bill.
- D. A small business pays a cash dividend to its owner because she's not sure she will have enough funds to pay for Christmas gifts for her family.

Answer: A Type: Concept Difficulty: Easy LO: 24.1

16. Cash on hand provides:

- A. low return, high liquidity, and low default risk
- B. high return, high liquidity, and low default risk
- C. high return, high liquidity, and high default risk
- D. low return, high liquidity, and high default risk

Answer: A Type: Concept Difficulty: Easy LO: 24.1

17. A firm taking a conservative approach with respect to its cash balance is most likely to be:

- A. holding as much credit as possible
- B. holding as much cash as possible
- C. holding as much borrowing ability as possible
- D. holding as much long-term debt as possible

Answer: B Type: Concept Difficulty: Easy LO: 24.1

18. A firm taking an aggressive approach with respect to their cash balance is most likely to be:

- A. holding as little cash as possible
- B. holding as much cash as possible
- C. holding as much credit as possible
- D. holding as little borrowing power as possible

Answer: A Type: Concept Difficulty: Easy LO: 24.1

19. The optimal cash balance is one that

- A. Balances liquidity against sacrificing expected return
- B. Balances illiquidity against sacrificing borrowing power

- C. Balances illiquidity against sacrificing expected return
- D. Balances illiquidity against sacrificing expected profits

Answer: C Type: Definition Difficulty: Easy LO: 24.1

20. Which of the following scenarios is an example of the finance motive to hold cash?

- A. A government holds cash to pay for its operating expenses.
- B. A taxi company holds cash in reserve in case some of its vehicles require repairs.
- C. A company that makes motion pictures holds cash to pay for special effects for a new film.
- D. A bank holds cash to pay its shareholders their annual dividend.

Answer: D Type: Concept Difficulty: Easy LO: 24.1

21. Which of the following firms will have the highest cash balance?

- A. A firm with low cash requirements but unpredictable cash needs
- B. A firm with high cash requirements but unpredictable cash needs
- C. A firm with high cash requirements but predictable cash needs
- D. A firm with low cash requirements but predictable cash needs

Answer: B Type: Concept Difficulty: Easy LO: 24.1

22. One way to alleviate the problem of the low returns associated with cash, but still maintain high liquidity is to

- A. Keep no cash on hand
- B. Invest in more bonds
- C. Borrow funds at a lower interest rate
- D. Invest in marketable securities

Answer: D Type: Concept Difficulty: Difficult LO: 24.1

23. The level of a firm's investment in marketable securities is dictated by its:

- A. Liquidity requirements
- B. Accuracy of cash requirement needs forecasts
- C. Accuracy of cash requirement needs and level of returns
- D. Liquidity requirements and accuracy of cash requirement needs

Answer: D Type: Concept Difficulty: Difficult LO: 24.1

24. The main premise to good cash management is to:

- A. Sell at the highest profit possible
- B. Collect sales as quickly as possible and sell at the highest price
- C. Sell at the highest profit and pay expenses as late as possible
- D. Delay payables as much as possible and collect receivables as soon as possible

Answer: D Type: Concept Difficulty: Easy LO: 24.1

25. The drawbacks to delaying making payments may include all the following, except

- A. Alienating suppliers
- B. Losing out on valuable trade credit
- C. Loss of business
- D. Reduced liquidity

Answer: D Type: Concept Difficulty: Difficult LO: 24.1

26. The float is defined as:

- A. The time between when payables are accrued and when they are paid
- B. The time between when the sale is made and when the money is available for use by the receiving firm
- C. The time between when payment is initiated and the time the money is available for use by the receiving firm
- D. The time between when sale is made and the time the payment cheque is issued to the receiving firm

Answer: C Type: Definition Difficulty: Easy LO: 24.1

27. All of the following are components of float except:

- A. The time it takes the receiving firm to make a sale on credit and receive payment from the purchasing firm
- B. The time it takes the cheque to clear through the banking system so that the funds are available to the firm
- C. The time it takes the receiving firm to process the cheque and deposit it in an account
- D. The time it takes the cheque to reach the firm after it is mailed by the customer

Answer: A Type: Definition Difficulty: Easy LO: 24.1

28. A post-dated cheque is:

- A. A cheque dated before the purchase has been made
- B. A cheque written after the purchase has been made
- C. A cheque dated at the date the purchase was made
- D. A cheque dated later than the date the purchase was made

Answer: D Type: Definition Difficulty: Easy LO: 24.1

29. Which of the following is/are alternatives to paying with a cheque?

- A. Electronic funds transfer
- B. Debit cards
- C. Electronic data interchange
- D. All of the above

Answer: D Type: Concept Difficulty: Easy LO: 24.1

30. Firms implement centralized systems with respect to receivables and payables in order to:

- A. Monitor collections
- B. Ensure payments are made on time
- C. Monitor payments
- D. All the above

Answer: D Type: Concept Difficulty: Easy LO: 24.1

Section 24.2 Accounts Receivable

31. Which of the following is/ are part of the credit granting decision?

- A. The credit terms
- B. Whether to grant credit
- C. Details of the collection process

D. All of the above

Answer: D Type: Concept Difficulty: Medium LO: 24.2

32. A company's trade credit decision is largely set by all of the following criteria except

- A. The nature of the product sold
- B. The industry the firm operates in
- C. The company's profitability
- D. Competitors' credit policies

Answer: C Type: Concept Difficulty: Medium LO: 24.2

33. An open account credit occurs when a firm:

- A. Grants trade credit to customers who have an account with the firm
- B. Grants trade credit to customers who have depository accounts
- C. Grants trade credit to customers by collateralizing the assets sold to the customer
- D. Grants credit to customers who have an open bank account

Answer: C Type: Definition Difficulty: Medium LO: 24.2

34. The credit terms offered to a customer include all the following except:

- A. Due date
- B. Discount date
- C. Discount amount
- D. Product on discount

Answer: D Type: Definition Difficulty: Easy LO: 24.2

35. If the current credit policy is 3/30 net 60, which of the following *tightens* the credit policy?

- A. 3/30 net 90
- B. 3/35 net 75
- C. 2/30 net 60
- D. 3/20 net 45

Answer: D Type: Concept Difficulty: Medium LO: 24.2

36. Use the following statements to answer this question:

I. A high receivable turnover is a good credit strategy that allows firms to lower working capital requirements

II. Trade credit terms are financing tools to the supplier

- A. I and II are correct
- B. I and II are incorrect
- C. I is correct and II is incorrect
- D. I is incorrect and II is correct

Answer: C Type: Concept Difficulty: Medium LO: 24.2

37. You are offered the following terms: 5/25 net 50. What is the effective annual interest rate for not paying on time, approximately?

- A. 111.5%
- B. 103.9%
- C. 76.8%

D. 45.4%

Answer: A Type: Calculation Difficulty: Medium LO: 24.2

$$k = (1 + 5/95)^{365/25} - 1 = 1.115 = 111.5\%$$

$$k = (1 + 5/100)^{365/25} - 1 = 1.039 = 103.9\%$$

$$k = (5/95) * (365/25) = 0.768 = 76.80\%$$

$$k = (1 + 5/95)^{365/50} - 1 = 0.454 = 45.4\%$$

D.

38. Your supplier offers you 6/20 net 60 terms. What is the effective annual interest rate for not paying on time, approximately?

A. 45.7%

B. 58.2%

C. 75.9%

D. 209.3%

Answer: C Type: Calculation Difficulty: Medium LO: 24.2

$$k = (1 + 6/94)^{365/60} - 1 = 0.457 = 45.7\%$$

$$k = (6/94) * (365/40) = 0.582 = 58.2\%$$

$$k = (1 + 6/94)^{365/40} - 1 = 0.759 = 75.9\%$$

$$k = (1 + 6/94)^{365/20} - 1 = 2.093 = 209.3\%$$

D.

39. A factoring company is:

A. A financial firm that buys receivables at a discount

B. A financial firm to which a company out-sources its collection process.

C. A and B

D. None of the above

Answer: C Type: Definition Difficulty: Easy LO: 24.2

40. Creditors are interested in assessing a borrower's capacity and character, as well as overall economic conditions when reviewing a loan application. Which of the following would make a bank more willing to lend funds?

- A. A small business faces deteriorating business conditions because of a recession in the overall economy.
- B. The owner of a small business has been personally bankrupt twice.
- C. A retail store has been diligent in making all of its payments on time and in full over the past five years.
- D. A large corporation missed an interest payment on one of its bond issues last month.

Answer: C Type: Concept Difficulty: Easy LO: 24.2

Section 24.3 Inventory

41. The following pairs are all costs of holding inventory except:

- A. Storage and insurance
- B. Obsolescence and inventory financing
- C. Handling and spoilage
- D. Purchase price and overhead

Answer: D Type: Concept Difficulty: Medium LO: 24.3

42. The ABC approach to inventory management divides inventory into

- A. Several categories based on first in first out basis
- B. Several categories based on first in last out basis
- C. Several categories based on overall level of importance and profitability
- D. Several categories based on overall type of product

Answer: C Type: Definition Difficulty: Medium LO: 24.3

43. The Economic Order Quantity (EOQ) model of inventory management determines the optimal inventory level that:

- A. Minimizes shortage costs
- B. Minimizes carrying costs
- C. A and B
- D. None of the above describes the EOQ model.

Answer: C Type: Definition Difficulty: Easy LO: 24.3

44. Under which scenario does the Economic Order Quantity inventory management model work poorly?

- A. A clothing retailer wants to reduce its inventory shortage costs without unnecessary increases in carrying costs.
- B. A grocery store wants to optimize its fruit and vegetable produce inventory, which has an 8% spoilage rate per week.
- C. A store that sells only Christmas decorations and Halloween costumes wants to optimize its inventory management.
- D. An online retailer wants to determine optimal inventory levels.

Answer: C Type: Concept Difficulty: Medium LO: 24.3

45. By adopting a “Just In Time inventory” management concept, a company will be vulnerable to:

- A. Suppliers bargaining power
- B. Acute changes in economic environment
- C. Suppliers risk of bankruptcy
- D. All of the above

Answer: D Type: Concept Difficulty: Medium LO: 24.3

Section 24.4 Short-Term Financing Considerations

46. An example of a *spontaneous* source of funds is:

- A. Short-term borrowing
- B. Bank credit line
- C. Trade credit
- D. Commercial paper loans

Answer: C Type: Definition Difficulty: Medium LO: 24.4

47. The prime lending rate is defined as:

- A. The rate banks give to their biggest customers
- B. The rate banks give to their best customers
- C. The rate banks give to their smallest customers
- D. The rate banks give their most prominent customers

Answer: B Type: Definition Difficulty: Medium LO: 24.4

48. Which of the following scenarios are examples of credit enhancements?

- A. A manufacturing company makes monthly payments into a sinking fund which it will use to repay principal to bondholders when the bonds mature.
- B. A trucking company obtains a lower interest rate on a bank loan for trucks by pledging the vehicles as collateral.
- C. Mortgages on residential properties must be insured by the Canada Mortgage and Housing Corporation if the down payment is less than 20%.
- D. All of the above.

Answer: D Type: Concept Difficulty: Medium LO: 24.4

49. Which of the following scenarios is an example of securitization?

- A. A bank issues more common shares to the public.
- B. A multinational manufacturing company sells fixed income securities to a European pension fund in a private deal.
- C. A bank creates fixed income securities using the receivables from mortgages on residential property, and sells them to a fixed income mutual fund.
- D. The Government of Canada sells 25-year Treasury bonds to raise funds for infrastructure.

Answer: C Type: Concept Difficulty: Medium LO: 24.4

50. The Toronto Skaters Company is being offered a one-year variable rate loan at a rate of prime + 0.75%. The loan is to be paid in quarterly installments and there are no other fees associated with it. The prime lending rate is currently 6% compounded quarterly. What is the effective annual cost of this loan?

- A. 6%
- B. 6.14%
- C. 6.75%
- D. 6.92%

Answer: D Type: Calculation Difficulty: Medium LO: 24.4

How choices were determined:

$$k = \left(1 + \frac{.06}{4}\right)^4 - 1 = .0614 = 6.14\%$$

B.

$$k = \left(1 + \frac{.0675}{4}\right)^4 - 1 = .0692 = 6.92\%$$

D.

51. All of the following are **tasks** performed by a factor except:

- A. Purchasing payables and extending loans
- B. Purchasing receivables
- C. Checking customers' **credit** and authorizing credit
- D. Receivables bookkeeping and **collection**

Answer: A Type: Definition Difficulty: Medium LO: 24.4

52. The two major types of money **market instruments** available are

- A. Credit lines and T-Bills
- B. T-bonds and junk bonds
- C. Bankers' acceptances and commercial paper
- D. Stocks and options

Answer: C Type: Concept Difficulty: Easy LO: 24.4

53. The Laurentide Resort Company would like to issue \$25 million face value of 60-day commercial paper at a cost of 0.65%. In addition, the firm must maintain the \$25 million credit line at a cost of 0.1% as a standby fee. What is the **effective** annual cost of this transaction?

- A. 4.02%
- B. 4.56%
- C. 4.65%
- D. 56.57%

Answer: C Type: Calculation Difficulty: Medium LO: 24.4

How each choice was obtained:

$$\text{discount} = 0.0065 * \$25,000,000 = \$162,500$$

$$\text{standby fee} = 0.001 * \$25,000,000 = \$25,000$$

$$\text{total financing costs} = \$162,500$$

$$k = \left(1 + \frac{\$0.1625}{25}\right)^{\frac{365}{60}} - 1 = 0.0402$$

B. $4.56\% = 0.0075 * 365/60$

$$\text{discount} = 0.0065 * \$25,000,000 = \$162,500$$

$$\text{standby fee} = 0.001 * \$25,000,000 = \$25,000$$

$$\text{total financing costs} = \$162,500 + \$25,000 = \$187,500$$

$$k = \left(1 + \frac{\$0.1875}{25}\right)^{\frac{365}{60}} - 1 = 0.0465$$

$$\text{discount} = 0.0065 * \$25,000,000 = \$162,500$$

$$\text{standby fee} = 0.001 * \$25,000,000 = \$25,000$$

$$\text{total financing costs} = \$162,500 + \$25,000 = \$187,500$$

$$k = \left(1 + \frac{\$0.1875}{25}\right)^{60} - 1 = 0.5657$$

54. Securitization refers to the process of:

- A. Bonds are sold to the public at a discount
- B. Stocks are issued to raise funds instead of bonds
- C. Loans and / or receivables are packaged to create new securities
- D. A portfolio of securities is sold to raise funds to pay debts

Answer: C Type: Definition Difficulty: Easy LO: 24.4

55. A firm would like to issue \$15 million face value of 30-day Bankers' acceptances quoted at 5.5% at a stamping fee of 0.25%. What is the effective annual cost to the firm?

- A. 4.65%
- B. 5.64%
- C. 8.90%
- D. 23.39%

Answer: C Type: Calculation Difficulty: Medium LO: 24.4

How choices were determined:

- A. Arbitrary

B. 5.64%

$$0.055 \times 30365 = \$15,000,000 - \text{Price}$$

$$0.0045 = \$15,000,000 - \text{Price}$$

$$0.0045 \times \text{Price} = \$15,000,000 - \text{Price}$$

$$1.0045 \times \text{Price} = \$15,000,000 = \$14,932,496.93$$

$$\text{discount} = \$15,000,000 - \$14,932,496.93 = \$67,503.07$$

$$\text{total financing costs} = \$67,503.07$$

$$k = 1 + \$67,503.07 / \$14,932,496.93 \times 30 - 1 = 0.0564$$

C. 8.90%

$$0.055 \times 30365 = \$15,000,000 - \text{Price}$$

$$0.0045 = \$15,000,000 - \text{Price}$$

$$0.0045 \times \text{Price} = \$15,000,000 - \text{Price}$$

$$1.0045 \times \text{Price} = \$15,000,000 = \$14,932,496.93$$

$$\text{discount} = \$15,000,000 - \$14,932,496.93 = \$67,503.07$$

$$\text{Total financing costs} = \$67,503.07 + \$37,500 = \$105,003.07$$

$$k = \left(1 + \frac{\$105,003.07}{\$14,932,496.93} \right)^{365/30} - 1 = 0.089$$

D. 23.40%

$$0.055 \times 30365 = \$15,000,000 - \text{Price}$$

$$0.0045 = \$15,000,000 - \text{Price}$$

$$0.0045 \times \text{Price} = \$15,000,000 - \text{Price}$$

$$1.0045 \times \text{Price} = \$15,000,000 = \$14,932,496.93$$

$$\text{discount} = \$15,000,000 - \$14,932,496.93 = \$67,503.07$$

$$\text{Total financing costs} = \$67,503.07 + \$37,500 = \$105,003.07$$

$$k = \left(1 + \frac{\$105,003.07}{\$14,932,496.93} \right)^{30} - 1 = 0.2339$$

Practice Problems

56. Current trends show firms holding less cash physically and preferring to hold liquidity in near-cash or cash equivalent securities or relying on standby lending. Explain fully why you think this is so.

Type: Concept Difficulty: Medium LO: 24.1

Suggested answer:

Firms are favouring investing in near-cash or cash equivalent securities because they provide the high level of liquidity that firms require while also providing a higher return than that obtained on cash. Although cash is the most liquid security, it has the lowest return. Furthermore, because the cost of standby lending facilities is relatively cheap compared with the opportunity cost of raising capital from the firm's shareholders to invest in marketable securities, firms find it convenient to have these standby loan agreements with their banks. Lastly, the precautionary, finance, and speculative motives of a firm's cash management policy can be all satisfied by using near-cash items, such as investments in marketable securities, and by maintaining additional short-term borrowing capacity.

57. Identify the pros and cons for being conservative/aggressive with respect to how much cash balance a firm should have. Also explain why creating liquidity quickly is expensive.

Type: Concept Difficulty: Easy LO: 24.1

Suggested answer:

By adopting a conservative strategy with respect to their cash balances, firms will minimize the risk of not being able to satisfy their liquidity requirements. Unfortunately, this approach sacrifices potential returns. Alternatively, firms can adopt a more aggressive approach to cash holdings and maintain minimal balances. This approach may lead to higher returns; however it also increases the firm's risk of becoming illiquid and it may need to generate liquidity in a hurry. Creating liquidity quickly is often very expensive, because the firm may have to negotiate short-term loans with higher borrowing rates. In extreme situations, the firm may be forced to sell less liquid assets, such as inventory or even fixed assets, at discounted prices.

58. In light of the last financial crisis, describe the importance of credit to companies and the importance of having access to available cash.

Type: Concept Difficulty: Medium LO: 24.1

Suggested answer:

During the last financial crisis, the banking system's liquidity dried up and the cost of borrowing jumped up, both of which served to put a lot of companies in jeopardy. The non-availability of cash pushed very well managed companies with good standing into a difficult situation. Companies were not able to raise short term cash to finance their operations which led to a near bankruptcy scenario for many of them. One such example is General Electric which saw itself obliged to borrow from the treasury of the US in order to finance its activities.

59. Clearly define what a zero-balance account is, how it functions, and the benefits associated with it in terms of a firm's cash management efforts.

Type: Definition Difficulty: Easy LO: 24.1

Suggested Answer:

A zero-balance account is an account that is centralized and combines the cash balances of many individual accounts into one central account. Under this system, funds are transferred from this account to cover cheques written against the aggregate firm level, because it effectively transfers funds from individual accounts that have excess cash to those that need it. In addition, firms usually tie their operating loans to this central account, reducing the total amount of borrowing required by the firm.

60. Can trade credit be labelled as a financing strategy? Provide an example of a firm that uses this strategy in their business model.

Type: Concept Difficulty: Medium LO: 24.2

Suggested answer:

Trade credit is a financing strategy because it allows the firm to finance its activities without having to borrow from a financial institution. One of the most successful examples of such a strategy is Dell Computers. Their business model proved to be very efficient in both financing and inventory management. When customers buy a computer they agreed to a delay of delivery given that the computer is custom made. This delay allows the company to collect the money before the delivery, and by paying suppliers at a later date they can finance production through sales.

61. What is credit analysis? When is it done? And, generally, what are the steps involved in the process?

Type: Concept Difficulty: Easy LO: 24.2

Suggested answer:

Credit analysis is a process designed to assess the risk of non-payment by potential customers. It is often conducted before a firm approves a customer buying goods on credit. First, information is collected about potential customers with respect to their credit history. Next, their ability to make payments, as reflected by their expected cash flows, is determined. Last, their overall financial stability is measured by evaluating their net worth and level of existing debt obligations.

62. List and explain the four C's of credit: capacity, character, collateral and conditions.

Type: Concept Difficulty: Easy LO: 24.2

Suggested answer:

Capacity refers to customers' ability to pay. Collateral refers to any assets pledged by customers as security for the loan. Character refers to the customers' willingness to pay, and how reliable and trustworthy they are. Finally, conditions refer to the current state of the economy. Macroeconomic issues may be so overwhelmingly burdensome that they can force customers to default despite the fact that they may have excellent capacity, character, and collateral.

63. Explain the difference between a firm's decision to grant customers trade credit and that of a bank's decision whether to extend loans to their customers. In your explanation provide a numerical example.

Type: Concept Difficulty: Difficult LO: 24.2

Suggested answer:

The difference between a bank's decision to issue a loan and a firm's decision to authorize trade credit to its customers is that the bank's profit from the loan is limited to its interest on the loan and in case of default the bank loses the entire amount (principal and interest). On the other hand, to the firm, the gains from granting trade credit are the expected establishment of a long-term relationship between the firm and its customers, which thereby increases the future cash flows the firm expects to receive.

For example, a bank loan of \$5,000 to a firm for one month at an interest rate of .5% (per month) generates a profit at the end of the year of \$25 but if the customer defaults the bank will lose the entire \$5,025. On the other hand, if the firm sells \$5,025 of product to a customer on credit at terms of .5/30 net 60, the firm will face three possible scenarios:

1. The customer will pay within the 30 days and the firm will receive \$5,000. As long as this is greater than the production costs, the firm will make a profit.
2. The customer pays later and pays the full amount of \$5,025. As long as this is greater than the production costs, the firm will make a profit. The firm also saves granting the discount of \$25 because the customer paid later.
3. The customer never pays. The firm loses the production costs of the product, which would be less than the selling price of \$5,025, and therefore loses less than the bank.

64. In the case of delayed or non-payment, describe in detail the general steps that firms must take in attempt to force payment or recover as much value as possible from the defaulting customer or customers.

Type: Concept Difficulty: Easy LO: 24.2

Suggested Answer:

When the date of payment is first exceeded, the first step firms take is charging interest on the overdue amount. After a predetermined period, they will then contact the customer, via phone, fax, email, etc., and ask them to settle their account. This reminder is followed up by another, just in case payment is still not received. After the second notification, the selling company will generally disallow its client from buying any more products on credit. It will choose between either handing over the delinquent account to a collection agency or pursuing legal action against the customer. Since these two options are usually more costly than the value of the account, firms may write off the amount as a bad debt and inform a credit agency about the customer's non-payment.

65. Discuss the limitation of the inventory turnover ratio as an effective inventory management tool.

Type: Concept Difficulty: Difficult LO: 24.3

Suggested answer:

The inventory turnover ratio is not completely effective as an inventory management tool because it does not measure shortage costs or explicitly measure financing costs. In addition, the turnover ratio cannot be compared across companies that use different methods of accounting for inventory. Lastly, the inventory turnover ratio does not break down the inventory in terms of raw materials, work in progress, and finished goods. Determining the components of inventory is important in establishing the market value of the inventory.

66. An important tool used in assessing the quality of receivables is the *aged accounts receivable report*. What is it, how does it work, and what are its positive and negative characteristics?

Type: Concept Difficulty: Medium LO: 24.4

Suggested answer:

The aged accounts receivable report is a tool used by firms to assess the quality of their receivables, and is often required by banks before they authorize loans to the requesting firm. The aged accounts receivable report categorizes the balances in receivables according to how long they have been outstanding. Generally receivables that have not been outstanding for very long are regarded as higher quality than those that have been outstanding beyond their due date. However, this characterization has its limitations because it does not distinguish between long standing accounts of credible borrowers (i.e., government) versus those of less credibility (i.e., another company); as such the report treats all borrowers as if they hold the same credit risk. This can be misleading when trying to correctly interpret the quality of a firm's receivables.

67. Explain how revolving loans work and how they are beneficial to firms who are trying to minimize their cost of borrowing and manage their short-term financing so that they do not become illiquid.

Type: Concept Difficulty: Medium LO: 24.4

Suggested answer:

Revolving loans are loan agreements between banks and their customers that allow the bank to "revolve" the loan periodically; in other words the bank is allowed to pay down the amount of the loan whenever there is sufficient cash in the customer's current account. The advantage to the customer is that they can increase their borrowing level when they have insufficient cash at the moment. The main benefit of having a revolving loan is that it reduces any unnecessary interest from being charged; this is because the loan is paid down automatically when the firm has sufficient levels of cash.

68. The Poutine Cheez Company has yearly sales of \$550,000 and an average collection period of 35 days. A factoring company is offering a 35-day receivables loan equal to 85% of the accounts receivable at 9% along with a commission fee of .45% of the receivables. The firm estimates that by taking the offer, it could save \$300 in collection costs and a full half of one percent in bad debt costs, as a percentage of sales. What is the annual cost (in percent) of the arrangement to Poutine Cheez?

Type: Calculation Difficulty: Difficult LO: 24.4

Suggested Answer

The effective annual cost is 3.04%

$$\text{accounts receivable} = 35\text{days} * \frac{\$550,000}{365} = \$52,739.73$$

$$\text{loan amount} = 0.85 * \$52,739.73 = \$44,828.77$$

$$\text{commission} = 0.0045 * \$52,739.73 = \$237.33$$

$$\text{interest} = 0.09 * \frac{35}{365} * \$44,828.77 = \$386.88$$

$$\text{savings} = \$300 + \left(0.005 * 35\text{days} * \frac{\$550,000}{365} \right) = \$563.70$$

$$\text{netcost} = \$237.33 + \$386.88 - \$563.70 = \$60.51$$

$$k = \left(1 + \frac{\$60.51}{\$44,828.77} \right)^{\frac{365}{35}} - 1 = 0.0142$$

69. The Queue de Castor Company is being offered a one-year \$1.45 million fixed rate loan at a rate of 5.75%. The loan is to be paid in quarterly installments and there is a monthly 0.5% commitment fee on the unused amounts. The firm borrows only \$0.5 million during the first 8 months of the loan and reduces its loan by a further \$0.2 million for the remaining 4 months. What is the effective annual cost (in percent) of this loan arrangement?

Type: Calculation Difficulty: Difficult LO: 24.2

Suggested Answer:

$$\text{interest}(1-8\text{months}) = \$500,000 * \frac{0.0575}{4} * \frac{8}{3} = \$19,167$$

$$\text{interest}(9-12\text{months}) = \$300,000 * \frac{0.0575}{4} * \frac{4}{3} = \$5,750$$

$$\text{fees}(1-8\text{months}) = 0.005 * (\$1.45\text{million} - \$0.5\text{million}) * 8 = \$38,000$$

$$\text{fees}(9-12\text{months}) = 0.005 * (\$1.45\text{million} - \$0.3\text{million}) * 4 = \$23,000$$

$$\text{total costs} = \$19,167 + \$5,750 + \$38,000 + \$23,000 = \$85,917$$

$$\text{average net financing} = \$500,000 * \frac{8}{12} + \$300,000 * \frac{4}{12} = \$433,333.33$$

$$k = \left(1 + \frac{\$85,917}{\$433,333.33} \right)^1 - 1 = 0.198$$

Effective annual cost = 19.8%

Unauthorized

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