Name: _____ Student Number: _____ Date: _____

BUSI 2504 – Fall 2015
Section: H
Essentials of Business Finance
Version 1
Mid term test - 90 Minutes

Please respond by completing the Scantron in the usual way **[i.e. fill in your name, student number and exam version number].** If there is a small difference between your calculated answer and the answers provided in the choices, please choose the answer that is closest to your calculation. Please answer all questions. All questions are worth equal marks.

Chapter 1

1. When a company refers to capital budgeting it is referring to:
   A) Planning and managing a firm's investment in long term assets;
   B) Making sure it has enough capital on hand to fund its business;
   C) Budgeting how much profit it will make in a year to add to its capital
   D) None of the above.

2. When a company refers to its capital structure it is referring to:
   A) The quantity of capital it has on hand;
   B) How it is structuring its capital expenditures over time;
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3. What is the goal of financial management in a publicly traded company?
   A) Making sure there is enough cash flow;
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   D) Maximize the current value per share of existing issued shares.
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4. When there is a potential conflict of interest between the shareholders and management of a firm, this is known as:
   A) Unethical behaviour;
   B) A common problem which has no resolution;
   C) An agency problem;
   D) A signal that a change of management is needed;
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5. The original sale of securities by governments and corporations occurs in the:
   A. Primary market.
   B. Secondary market.
   C. Dealer market.
   D. Auction market.
   E. Liquidation market.

6. Some corporations borrow and invest in the market in which short-term debt securities are bought and sold. This market is called:
   A) The stock market;
   B) The over the counter market;
   C) The Chicago Mercantile Exchange;
   D) The money market;
   E) None of the above.

7. The largest financial institutions in Canada tend to be;

A) Insurance companies;
B) Trust companies;
C) Stock brokerages;
D) Banks;
E) Mutual funds.

Chapter 5

8. The idea of compound interest is that:
A) Interest is earned on the reinvestment of previous interest payments;
B) It recognizes the time value of money;
C) Investments produce a yield;
D) It only applies to bonds that pay interest;
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9. Simple interest is the term used to describe the case where:
A) Interest is earned only on the initial principal invested;
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D) Interest is paid annually;
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10. Your company has to make a payment of $700,000 three years from now. It wants to put some money in an investment now in order to have enough money to make the future payment. If the current interest rate is 5%, how much money does the company have to put aside now to achieve this?
A) $701,050.72
B) $558,246.23
C) $604,686.32
D) $680,583.20
E) None of the above

$PV = \$700,000/(1.05)^3 = \$604,686.319$

11. If you invest $$1,000 today for 10 years at 12% how much interest will you have earned by the end of year 10?
A) $2,105.85
B) $4,554.51
C) $3202.33
D) 5,770.448
E) None of the above

Interest Earned = FV - PV = $[\$1000(1.12)^{10}] - \$1000 = \$3105.848 - \$1000 = \$2,105.848$

12. You are cleaning in the attic of your house, and you find some pennies (copper coins worth $0.01) from the year 1858 (with a picture of Queen Victoria). After looking on the Internet, you find that similar pennies from that year and condition, sell for $110 each. What was the average rate of return on these pennies?
A) 5.4%
B) 6.9%
C) 6.1%
D) 4.5%
E) 6.5%

N = 2015 – 1858 = 157; FV = $110; PV = -$0.01; CPT i/Y = 6.106%	$FV = \$110 = \$0.01(1+ r)^{(2015-1858)}$ $r = (\$110/0.01)^{1/157} – 1 = 1.06106 – 1 = 0.06106$ or 6.1%

13. You are saving to make a down payment on the purchase of a house. So far you have saved $15,255 but you need $30,000. If the interest rate is 7%, how many years will it be until you reach your goal in round years?
A) About 22 years

B) About 10 years
C) About 13 years
D) About 7 years
E) None of the above

PV = $15,255; i/Y = 7%; FV = $30,000; CPT n = 10 years

14. You are planning to graduate from your business degree in four years, and at that time you wish to buy a BMW motorcycle for $18,000. How much money would you have to invest in a mutual fund that had an expected rate of return of 7 percent?

A) $13,732.11
B) $14,542.50
C) $11,678.25
D) $12,568.95
E) $15,432.22

FV = $18,000; i/Y = 7%; N = 4 CPT PV = -$13,732.1138	FV = PV $(1+r)^t$ = $18,000 = PV $(1.07)^4$ = PV (1.310796) PV = $18,000/1.310796 = $13,732.11

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15. An annuity is:
A) A stream of equal cash flows for a fixed period of time;
B) Any payment stream equally spaced in time;
C) A level stream of cash flows that is paid in perpetuity;
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C) There is no easy way to calculate the present value of a growing annuity;
D) The value of the annuity (i.e. its present value) moves inversely with changes in the level of interest rates: as interest rates go up, value goes down and as interest rates go down, value goes up;
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17. Which statement most accurately describes the APR (Annual Percentage Rate);
A) It is the one plus the period rate compounded by the number of periods within the year;
B) It is the one plus the period rate compounded by the number of periods within the year minus 1;
C) It is the period rate multiplied by the number of periods within the year;
D) None of the above.

18. What is the present value of the following set of cash flows over the next four years? Assume an interest rate of 4.5%.

Year	0	1	2	3	4
Cash Flow	-$1200	$150	$250	$750	$800

A) $500.54
B) $425.45
C) $650.61
D) $551.75
E) $611.35

CF_0 = -1200; CF_1 = 150; CF_2 = 250; CF_3 = 750; CF_4 = $800
I = 4.5%, NPV = $500.54469

19. You have been told that the applicable interest rate is 6.35% per year infinitely compounded. What is the corresponding EAR?
    A) 8.19%
    B) 6.34%
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    D) 6.56%
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$1+ EAR = e^{0.0635} = 1.065559$; EAR = 0.0656 or 6.56%

20. If the period (semi-annual) rate is 3.25% and compounding is semi-annual, what is the corresponding EAR (effective annual rate)?
    A) 7.27%
    B) 6.61%
    C) 7.19%
    D) 8.91%
    E) None of the above

$EAR = (1.0325)^2 - 1 = 1.066056 - 1 = 0.066056$ or 6.61%

Chapter 7 and 7a

21. The terms *face value* or *par value* of an *n* year coupon bond is the following:
    A) The principal amount of a bond that is repaid at the maturity of the bond;
    B) The coupon that is paid to investors periodically;
    C) The value one can obtain through sale of the bond, or its purchase price;
    D) The present value of the amount to be repaid at maturity;
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22. Which of the following best describes the term *yield to maturity* for an *n* period bond paying a coupon at rate *r* semiannually?
    A) The coupon rate *r*;
    B) The annualized ratio of the final principal payment divided by current price of the bond;
    C) The EAR that results when 1 plus the coupon rate is compounded to reflect that payments are made semiannually, minus 1;
    D) The interest rate that equates a bond's present value of future payments to its price;
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23. *The Financial Post* lists a bond with the following information: The bond has a closing price of 96.96, a coupon of 6.500, maturity date of May 09/10 and Yld% of 6.51%. Which one of the following statements about this bond is correct?
    A. The closing price of the bond on the prior trading day was $1,096.96.
    B. The bond matures in 2009.
    C. **The yield to maturity is 6.51%.**
    D. The bond is a premium bond.
    E. Each coupon payment is $65.00.
    ANSWER: C

24. All other factors being equal, if the yield to maturity is [Blank #1] a bond's coupon rate, then the bond will trade at [Blank #2] compared to its face value. If the yield to maturity is [Blank #3] the bond's coupon rate, then the bond will trade at [Blank #4] compared to its face value. If the yield to maturity is [Blank #5] the bond's coupon rate, then the bond will trade at [Blank #6] compared to its face value.
    A) (1) less than, (2) a discount; (3) greater than, (4) a premium; (5) equal to, (6) higher
    B) (1) equal to, (2) equal to, (3) less than, (4) a premium, (5) greater than, (6) a discount
    C) (1) equal to, (2) a premium, (3) greater than, (4) a discount; (5) less than, (6) a premium

D) (1) greater than, (2) equal; (3) less than, (4) a premium; (5) equal to, (6) a discount
E) (1) less than, (2) equal; (3) equal to, (4) a discount; (5) greater than, (6) a premium
ANSWER: B

25. You earn a 5% real return. If the inflation rate is 4%, what is your exact nominal return?
A. 0.96%.
B. 1.09%.
C. 9.00%.
D. 9.20%.
E. 10.92%.
ANSWER: D
1+R = (1.05)(1.04) = 1.092; R = 0.092 or 9.2%

26. Plotting a yield curve can involve determining the discount rates for zero coupon bonds. The observed prices for $1,000 face value 5 and 6-year maturity zero-coupon bonds are $694.94 and $623.56 respectively. What are the discount rates corresponding to these maturities?
A) 7.23% and 7.95%
B) 7.55% and 8.19%
C) 8.12% and 8.45%
D) 9.12% and 9.37%
E) None of the above

$R_{5yr} = (FV/PV)^{1/5} - 1 = 1.0755 - 1 = 0.0755$ or 7.55%
$R_{6yr} = (FV/PV)^{1/6} - 1 = 1.0818996 - 1 = 0.0819$ or 8.19%

27. One year ago today, a $1,000 face value, 6% coupon (semi-annual) bond was selling for $1,100. It had 5 years until maturity. What was its Yield to Maturity at that time?

A) 4.55%
B) 6.78%
C) 2.48%
D) 3.79%
E) 5.11%

Yield Year Ago
FV = 1000; PV=-1100; PMT = 60/2 =30; N=5*2 = 10
CPT i/Y = 1.8930
Market Yield = 1.8930 * 2 = 3.78559 or 3.79%

28. A zero coupon bond has a remaining term of 15 years. The nominal market yield is 3.5% (compounded semi-annually). What price should this bond be selling for?

A. $975
B. $456
C. $655
D. $356
E. $594

Bond B = $1000(1.0175)$^{-30}$ = $594.24764
FV = 1000; PMT = 0; I/Y=3.5/2=1.75%; N=15*2 = 30
CPT PV = $594.25

29. A bond pays annual coupons of $23, and it has 5 years until it matures. The current market yield is 3.5%. Approximately, what would this bond's MacCauley Duration value in years?
A) 3.75
B) 4.77
C) 3.95
D) 4.95
E) 5.21

N	CF	PV Factor	N * CF * PV
1	$23	0.966183575	$22.22
2	$23	0.9335107	$42.94
3	$23	0.901942706	$62.23
4	$23	0.871442228	$80.17
5	$1,023	0.841973167	$4,306.69
			$4,514.26
	Bond Price		$945.82
	McCauley Duration		4.772859735

30. Based on the result from the previous question, what would be the Modified Duration for this bond?

A) 4.61
B) 6.25
C) 2.56
D) 3.98
E) 5.25

	CF	PV Factor	N * CF * PV
	$23	0.966183575	$22.22
	$23	0.9335107	$42.94
	$23	0.901942706	$62.23
	$23	0.871442228	$80.17
	$1,023	0.841973167	$4,306.69
			$4,514.26
	Bond Price		$945.82
	McCauley Duration		4.772859735
	Modified Duration		4.611458681

Chapter 8

31. Dividend yield is:

A) Net income per share divided by share price;
B) The cash dividend paid divided by the par value of the common share;
C) The nominal coupon rate on a preferred share;
D) A stock's cash dividend divided by its current price;
E) None of the above.

32. Movement in Research (MIR) Inc.'s stocks are currently trading at $51.50 per share on the stock exchange. MIR's stocks are expected to pay a $1.75 annual dividend, next year, and these dividends will grow at a constant rate for the foreseeable future. Assuming that the market requires a rate of return of 9.5 percent on stocks similar to MIR's, what is its expected dividend growth rate (g), based on its current stock price?

A) 5.5%
B) 6.1%
C) 6.7%
D) 4.9%
E) 5.2%

$P = C_1/(R - g) = \$51.50 = \$1.75/(0.095 - g)$
$\$51.50(0.095 - g) = \$1.75$
$0.095 - g = \$1.75/\$51.50$
$0.095 - g = 0.033981$
$g=0.061019$ or 6.1%

33. When valuing common share dividend streams a growth rate is generally assumed because:

A) It is often the case that firms reinvest some of their profits each year causing the future dividend stream to become larger over time;
B) It seems like a good idea;
C) It is management's job to grow the business;
D) The statement is not true – dividend streams are seldom assumed to grow over time;
E) None of the above.

34. One condition that must be imposed in order to value dividend streams with growth is the following:
A) The growth rate must always be greater than the discount rate;
B) In a perpetual dividend stream the growth rate can only be applied to the first few years;
C) The discount rate (Required Rate of Return) must be larger than the dividend growth rate;
D) Since a growing perpetual dividend stream cannot be valued, the dividend growth rate must be set to zero;
E) None of the above.

35. A preferred stock it:
A) A stock that performs better than common stock, so it is preferred over common stock;
B) Another name for debt;
C) Stock with dividend priority over common stock, normally with a fixed dividend rate, often without voting privileges;
D) None of the above.

36. A common stock is:
A) A stock that pays a fixed dividend expressed as a percentage of its face or par value;
B) A stock that trades on many markets so it can be commonly found;
C) A share in equity that does not pay a dividend;
D) Equity without priority in bankruptcy;
E) None of the above.

37. PineApple Computers Inc. has just released its new jPad tablet and it is experiencing huge demand for this revolutionary product. Recently, it paid a $3.00 annual dividend. Market analysts expect the company's dividends to grow at a supernormal rate of 25% for next three years. After these three years of supernormal growth, PineApple's dividends are expected to grow at a normal rate of 4% indefinitely. Shares similar to PineApple have an expected market required return of 12%. What should be the estimated selling price of PineApple's shares?

A) $55.75
B) $65.47
C) $62.75
D) $58.90
E) $70.65

$P_3 = \$3(1.25)^3(1.04)/(0.12-0.04) = \$76.171875$
$P_0 = [\$3(1.25)/1.12] + [\$3(1.25)^2/1.12^2] + [(\$76.171875 + \$3(1.25)^3)/1.12^3]$
$= [\$3.75/1.12] + [\$4.6875/1.12^2] + [(\$76.171875 + \$5.8594)/1.12^3]$
$= \$3.75/1.12 + \$4.6875/1.12^2 + \$82.03125/1.12^3 = 3.34821 + 3.7368 + 58.3882$
$= \$65.47328$

38. A company pays a dividend every year. Just now it paid a dividend of $2.00. The dividend is expected to grow at a rate of 4% per year. What is the value per share if the relevant discount rate is 8% per year?
A) $50.00
B) $52.00
C) $46.67
D) $44.44
E) None of the above

$P_0 = [\$2.00(1.04)]/(0.08 - 0.04) = \$52$

39. Current share price is $33.59 and the dividend due in one year's time is $3.52. It is expected to grow for the foreseeable future at a rate of 2.35%. What is the discount rate that is being used to price this share?

A) 11.73%
B) 10.36%
C) 12.58%
D) 12.83%
E) None of the above

$R = D_1/P_0 + g = (\$3.52/\$33.59) + 0.0235 = 0.10479 + 0.0235 = 0.12829$ or 12.83%

40. The Empire Bank of Canada Ltd is planning to issue some preferred shares. These preferred shares pay a constant annual dividend of $4 per share, which will remain in place for the foreseeable future. Since this is considered to be safer investment, the required market rate is only 6 percent. What should be the price of these shares?

A) $72.50
B) $64.68
C) $62.80
D) $66.67
E) $65.25

Empire Bank = $4/0.06 = $66.667

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    A. The closing price of the bond on the prior trading day was $1,096.96.
    B. **The yield to maturity is 6.51%.**
    C. The bond matures in 2009.
    D. The bond is a premium bond.
    E. Each coupon payment is $65.00.
    ANSWER: B

24. All other factors being equal, if the yield to maturity is [Blank #1] a bond's coupon rate, then the bond will trade at [Blank #2] compared to its face value. If the yield to maturity is [Blank #3] the bond's coupon rate, then the bond will trade at [Blank #4] compared to its

face value. If the yield to maturity is [Blank #5] the bond's coupon rate, then the bond will trade at [Blank #6] compared to its face value.

A) (1) less than, (2) a discount; (3) greater than, (4) a premium; (5) equal to, (6) higher

B) (1) equal to, (2) equal to, (3) less than, (4) a premium, (5) greater than, (6) a discount

C) (1) equal to, (2) a premium, (3) greater than, (4) a discount; (5) less than, (6) a premium

D) (1) greater than, (2) equal; (3) less than, (4) a premium; (5) equal to, (6) a discount

E) (1) less than, (2) equal; (3) equal to, (4) a discount; (5) greater than, (6) a premium

ANSWER: B

25. You earn a 5% real return. If the inflation rate is 4%, what is your exact nominal return?

A. 0.96%.
B. 1.09%.
C. 9.20%.
D. 9.00%.
E. 10.92%.
ANSWER: C
1+R = (1.05)(1.04) = 1.092; R = 0.092 or 9.2%

26. Plotting a yield curve can involve determining the discount rates for zero coupon bonds. The observed prices for $1,000 face value 5 and 6-year maturity zero-coupon bonds are $694.94 and $623.56 respectively. What are the discount rates corresponding to these maturities?

A) 7.23% and 7.95%
B) 8.12% and 8.45%
C) 7.55% and 8.19%
D) 9.12% and 9.37%
E) None of the above

$R_{5yr} = (FV/PV)^{1/5} - 1 = 1.0755 - 1 = 0.0755$ or 7.55%
$R_{6yr} = (FV/PV)^{1/6} - 1 = 1.0818996 - 1 = 0.0819$ or 8.19%

27. One year ago today, a $1,000 face value, 6% coupon (semi-annual) bond was selling for $1,100. It had 5 years until maturity. What was its Yield to Maturity at that time?

A) 4.55%
B) 6.78%
C) 3.79%
D) 2.48%
E) 5.11%

Yield Year Ago
FV = 1000; PV=-1100; PMT = 60/2 =30; N=5*2 = 10; CPT i/Y = 1.8930
Market Yield = 1.8930 * 2 = 3.78559 or 3.79%

28. A zero coupon bond has a remaining term of 15 years. The nominal market yield is 3.5% (compounded semi-annually). What price should this bond be selling for?

A) $975
B) $456
C) $655
D) $356
E) $594

Bond B = $1000(1.0175)$^{-30}$ = $594.24764
FV = 1000; PMT = 0; I/Y=3.5/2=1.75%; N=15*2 = 30
CPT PV = $594.25

29. A bond pays annual coupons of $23, and it has 5 years until it matures. The current market yield is 3.5%. Approximately, what would this bond's MacCauley Duration value in years?

A) 3.75
B) 3.95
C) 4.77
D) 4.95
E) 5.21

N	CF	PV Factor	N * CF * PV
1	$23	0.966183575	$22.22
2	$23	0.9335107	$42.94
3	$23	0.901942706	$62.23
4	$23	0.871442228	$80.17
5	$1,023	0.841973167	$4,306.69
			$4,514.26
	Bond Price		$945.82
	McCauley Duration		4.772859735

30. Based on the result from the previous question, what would be the Modified Duration for this bond?

A) 6.25
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D) 3.98
E) 5.25

	CF	PV Factor	N * CF * PV
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Chapter 8

31. Dividend yield is:

A) Net income per share divided by share price;
B) The cash dividend paid divided by the par value of the common share;
C) The nominal coupon rate on a preferred share;
D) A stock's cash dividend divided by its current price;
E) None of the above.

32. Movement in Research (MIR) Inc.'s stocks are currently trading at $51.50 per share on the stock exchange. MIR's stocks are expected to pay a $1.75 annual dividend, next year, and these dividends will grow at a constant rate for the foreseeable future. Assuming that the market requires a rate of return of 9.5 percent on stocks similar to MIR's, what is its expected dividend growth rate (g), based on its current stock price?

A) 5.5%

B) 6.1%
C) 6.7%
D) 4.9%
E) 5.2%

$P = C_1/(R - g) = \$51.50 = \$1.75/(0.095 - g)$
$\$51.50(0.095 - g) = \$1.75$
$0.095 - g = \$1.75/\$51.50$
$0.095 - g = 0.033981$
$g=0.061019$ or 6.1%

33. When valuing common share dividend streams a growth rate is generally assumed because:
    A) It is often the case that firms reinvest some of their profits each year causing the future dividend stream to become larger over time;
    B) It seems like a good idea;
    C) It is management's job to grow the business;
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34. One condition that must be imposed in order to value dividend streams with growth is the following:
    A) The growth rate must always be greater than the discount rate;
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35. A preferred stock is:
    A) A stock that performs better than common stock, so it is preferred over common stock;
    B) Another name for debt;
    C) Stock with dividend priority over common stock, normally with a fixed dividend rate, often without voting privileges;
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    A) A stock that pays a fixed dividend expressed as a percentage of its face or par value;
    B) A stock that trades on many markets so it can be commonly found;
    C) A share in equity that does not pay a dividend;
    D) Equity without priority in bankruptcy;
    E) None of the above.

37. PineApple Computers Inc. has just released its new jPad tablet and it is experiencing huge demand for this revolutionary product. Recently, it paid a $3.00 annual dividend. Market analysts expect the company's dividends to grow at a supernormal rate of 25% for next three years. After these three years of supernormal growth, PineApple's dividends are expected to grow at a normal rate of 4% indefinitely. Shares similar to PineApple have an expected market required return of 12%. What should be the estimated selling price of PineApple's shares?
    A) $55.75
    B) $65.47
    C) $62.75
    D) $58.90
    E) $70.65

$P_3 = \$3(1.25)^3(1.04)/(0.12-0.04) = \$76.171875$
$P_0 = [\$3(1.25)/1.12] + [\$3(1.25)^2/1.12^2] + [(\$76.171875 + \$3(1.25)^3)/1.12^3]$
$= [\$3.75/1.12] + [\$4.6875/1.12^2] + [(\$76.171875 + \$5.8594)/1.12^3]$
$= \$3.75/1.12 + \$4.6875/1.12^2 + \$82.03125/1.12^3$
$= 3.34821 + 3.7368 + 58.3882$
$= \$65.47328$

38. A company pays a dividend every year. Just now it paid a dividend of $2.00. The dividend is expected to grow at a rate of 4% per year. What is the value per share if the relevant discount rate is 8% per year?
    A) $50.00
    B) $46.67
    C) $52.00
    D) $44.44
    E) None of the above

    $P = D_0(1+g)/(R-g) = \$2.08/0.04 = \$52$

39. Current share price is $33.59 and the dividend due in one year's time is $3.52. It is expected to grow for the foreseeable future at a rate of 2.35%. What is the discount rate that is being used to price this share?
    A) 12.83%
    B) 11.73%
    C) 10.36%
    D) 12.58%
    E) None of the above

    $R = D_1/P_0 + g = \$3.52/\$33.59 + 0.0235 = 0.104793 + 0.0235 = 0.1283$ or 12.83%

40. The Empire Bank of Canada Ltd is planning to issue some preferred shares. These preferred shares pay a constant annual dividend of $4 per share, which will remain in place for the foreseeable future. Since this is considered to be safer investment, the required market rate is only 6 percent. What should be the price of these shares?
    A) $72.50
    B) $66.67
    C) $62.80
    D) $64.68
    E) $65.25

    Empire Bank = $4/0.06 = $66.667

BUSI 2504 – Fall 2015
Section: H
Essentials of Business Finance
Version 3
Mid term test - 90 Minutes

Please respond by completing the Scantron in the usual way **[i.e. fill in your name, student number and exam version number].** If there is a small difference between your calculated answer and the answers provided in the choices, please choose the answer that is closest to your calculation. Please answer all questions. All questions are worth equal marks.

Chapter 1

1. When a company refers to capital budgeting it is referring to:
   A) Planning and managing a firm's investment in long term assets;
   B) Making sure it has enough capital on hand to fund its business;
   C) Budgeting how much profit it will make in a year to add to its capital
   D) None of the above.

2. When a company refers to its capital structure it is referring to:
   A) The quantity of capital it has on hand;
   B) How it is structuring its capital expenditures over time;
   C) The mix of debt and equity maintained by a firm;
   D) Both a) and b);
   E) None of the above.

3. What is the goal of financial management in a publicly traded company?
   A) Making sure there is enough cash flow;
   B) Raising equity to finance the firm;
   C) Increasing dividends
   D) Maximize the current value per share of existing issued shares.
   E) None of the above.

4. When there is a potential conflict of interest between the shareholders and management of a firm, this is known as:
   A) Unethical behaviour;
   B) A common problem which has no resolution;
   C) An agency problem;
   D) A signal that a change of management is needed;
   E) None of the above.

5. The original sale of securities by governments and corporations occurs in the:

   A. Primary market.
   B. Secondary market.
   C. Dealer market.
   D. Auction market.
   E. Liquidation market.

6. Some corporations borrow and invest in the market in which short-term debt securities are bought and sold. This market is called:
   A) The stock market;
   B) The over the counter market;
   C) The Chicago Mercantile Exchange;
   D) The money market;
   E) None of the above.

7. The largest financial institutions in Canada tend to be;
    A) Insurance companies;
    B) Trust companies;
    C) Stock brokerages;
    D) Banks;
    E) Mutual funds.

Chapter 5

8. The idea of compound interest is that:
    A) Interest is earned on the reinvestment of previous interest payments;
    B) It recognizes the time value of money;
    C) Investments produce a yield;
    D) It only applies to bonds that pay interest;
    E) None of the above;

9. Simple interest is the term used to describe the case where:
    A) Interest is earned only on the initial principal invested;
    B) It is a simpler version of more complicated valuation techniques;
    C) Interest is earned on interest;
    D) Interest is paid annually;
    E) None of the above;

10. Your company has to make a payment of $1,000,000 five years from now. It wants to put some money in an investment now in order to have enough money to make the future payment. If the current interest rate is 8%, how much money does the company have to put aside now to achieve this?
    A) $650,270.24
    B) $594,226.27
    C) $604,686.32
    D) $680,583.20
    E) None of the above

    $PV = \$1{,}000{,}000/1.08^5 = \$680{,}583.197$

11. If you invest $$3,000 today for 12 years at 8% how much interest will you have earned by the end of year 12?
    A) $2,105.85
    B) $4,554.51
    C) $3202.33
    D) 5,770.448
    E) None of the above

r	12%	8%
n	10	12
PV	1,000.00	3,000.00
FV	3,105.85	7,554.51
Interest	2,105.85	4,554.51

12. You are cleaning in the attic of your house, and you find some pennies (copper coins worth $0.01) from the year 1858 (with a picture of Queen Victoria). After looking on the Internet, you find that similar pennies from that year and condition, sell for $110 each. What was the average rate of return on these pennies?
    A) 5.4%
    B) 6.9%
    C) 6.1%
    D) 4.5%
    E) 6.5%

N = 2015 – 1858 = 157; FV = $110; PV = -$0.01; CPT i/Y = 6.106%	$FV = \$110 = \$0.01(1+r)^{(2015-1858)}$ $r = (\$110/0.01)^{1/157} - 1 = 1.06106 - 1 = 0.06106$ or 6.1%

13. You are saving to make a down payment on the purchase of a house. So far you have saved $30,035 but you need $60,000. If the interest rate is 7%, how many years will it be until you reach your goal in round years?
    A) About 22.56 years
    B) About 10.22 years
    C) About 13.27 years
    D) About 7.34 years
    E) None of the above

PV = $30,035; i/Y = 7%; FV = $60,000; CPT n = 10.22 years

14. You are planning to graduate from your business degree in four years, and at that time you wish to buy a BMW motorcycle for $18,000. How much money would you have to invest in a mutual fund that had an expected rate of return of 7 percent?
    A) $13,732.11
    B) $14,542.50
    C) $11,678.25
    D) $12,568.95
    E) $15,432.22

FV = $18,000; i/Y = 7%; N = 4 CPT PV = -$13,732.1138	FV = PV $(1+r)^t$ = $18,000 = PV $(1.07)^4$ = PV (1.310796) PV = $18,000/1.310796 = $13,732.11

Chapter 6

15. An annuity is:
    A) A stream of equal cash flows for a fixed period of time;
    B) Any payment stream equally spaced in time;
    C) A level stream of cash flows that is paid in perpetuity;
    D) A lump sum paid at a future point in time;
    E) None of the above.

16. The application of time value of money principles has the effect that:
    A) An annuity is always worth (i.e. has a present value) more than the sum of the individual payments that comprise the annuity;
    B) The future value of the annuity is always an amount that is less than the present value of the annuity;
    C) There is no easy way to calculate the present value of a growing annuity;
    D) The value of the annuity (i.e. its present value) moves inversely with changes in the level of interest rates: as interest rates go up, value goes down and as interest rates go down, value goes up;
    E) None of the above.

17. Which statement most accurately describes the APR (Annual Percentage Rate);
    A) It is the one plus the period rate compounded by the number of periods within the year;
    B) It is the one plus the period rate compounded by the number of periods within the year minus 1;
    C) It is the period rate multiplied by the number of periods within the year;
    D) None of the above.

18. What is the present value of the following set of cash flows over the next four years? Assume an interest rate of 4.5%.

Year	0	1	2	3	4
Cash Flow	-$1200	$150	$250	$750	$800

    A) $500.54
    B) $425.45
    C) $650.61
    D) $551.75
    E) $611.35

$CF_0 = -1200$; $CF_1 = 150$; $CF_2 = 250$; $CF_3 = 750$; $CF_4 = \$800$
I = 4.5%, NPV = $500.54469

19. You have been told that the applicable interest rate is 7.87% per year infinitely compounded. What is the corresponding EAR (Effective Annual Rate)?
    A) 8.19%
    B) 6.34%
    C) 9.23%
    D) 6.56%
    E) None of the above

$1+ EAR = e^{0.0787} = 1.08188$; EAR = 0.0819 or 8.19%

20. If the period rate is 1.75% and compounding is quarterly, what is the corresponding EAR?
    A) 7.27%
    B) 6.61%
    C) 7.19%
    D) 8.91%
    E) None of the above

$EAR = (1.0175)^4 - 1 = 0.071859$ or 7.19%

Chapter 7 and 7a

21. The terms *face value* or *par value* of an *n* year coupon bond is the following:
    A) The principal amount of a bond that is repaid at the maturity of the bond;
    B) The coupon that is paid to investors periodically;
    C) The value one can obtain through sale of the bond, or its purchase price;
    D) The present value of the amount to be repaid at maturity;
    E) None of the above.

22. Which of the following best describes the term *yield to maturity* for an *n* period bond paying a coupon at rate *r* semiannually?
    A) The coupon rate *r*;
    B) The annualized ratio of the final principal payment divided by current price of the bond;
    C) The EAR that results when 1 plus the coupon rate is compounded to reflect that payments are made semiannually, minus 1;
    D) The interest rate that equates a bond's present value of future payments to its price;
    E) None of the above.

23. *The Financial Post* lists a bond with the following information: The bond has a closing price of 96.96, a coupon of 6.500, maturity date of May 09/10 and Yld% of 6.51%. Which one of the following statements about this bond is correct?
    A. The closing price of the bond on the prior trading day was $1,096.96.
    B. The bond matures in 2009.
    C. **The yield to maturity is 6.51%.**
    D. The bond is a premium bond.
    E. Each coupon payment is $65.00.
    ANSWER: C

24. All other factors being equal, if the yield to maturity is [Blank #1] a bond's coupon rate, then the bond will trade at [Blank #2] compared to its face value. If the yield to maturity is [Blank #3] the bond's coupon rate, then the bond will trade at [Blank #4] compared to its face value. If the yield to maturity is [Blank #5] the bond's coupon rate, then the bond will trade at [Blank #6] compared to its face value.

A) (1) less than, (2) a discount; (3) greater than, (4) a premium; (5) equal to, (6) higher
B) (1) equal to, (2) equal to, (3) less than, (4) a premium, (5) greater than, (6) a discount
C) (1) equal to, (2) a premium, (3) greater than, (4) a discount; (5) less than, (6) a premium
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ANSWER: B

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A. 0.96%.
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C. 9.00%.
D. 9.20%.
E. 10.92%.
ANSWER: D
1+R = (1.05)(1.04) = 1.092; R = 0.092 or 9.2%

26. Plotting a yield curve can involve determining the discount rates for zero coupon bonds. The observed prices for $1,000 face value 4 and 5-year maturity zero-coupon bonds are $731.77 and $666.58 respectively. What are the discount rates corresponding to these maturities?
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$R_{4yr} = (FV/PV)^{1/4} - 1 = 1.0812 - 1 = 0.0812$ or 8.12%
$R_{5yr} = (FV/PV)^{1/5} - 1 = 1.0844999 - 1 = 0.0845$ or 8.45%

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    $P_0 = [\$3(1.25)/1.12] + [\$3(1.25)^2/1.12^2] + [(\$76.171875 + \$3(1.25)^3)/1.12^3]$
    $= [\$3.75/1.12] + [\$4.6875/1.12^2] + [(\$76.171875 + \$5.8594)/1.12^3]$
    $= \$3.75/1.12 + \$4.6875/1.12^2 + \$82.03125/1.12^3 = 3.34821 + 3.7368 + 58.3882$
    $= \$65.47328$

38. A company pays a dividend every year. Just now it paid a dividend of $4.00. The dividend is expected to grow at a rate of 5% per year. What is the value per share if the relevant discount rate is 14% per year?
    A) $50.00
    B) $52.00
    C) $46.67

D) $44.44
E) None of the above

$P = D_0(1+g)/(R-g) = \$4(1.05)/(0.09) = \$46.667$

39. Current share price is $35.32 and the dividend due in one year's time is $2.96. It is expected to grow for the foreseeable future at a rate of 3.35%. What is the discount rate that is being used to price this share?
A) 11.73%
B) 10.36%
C) 12.58%
D) 12.83%
E) None of the above

$R = [D_1/P_0] + g = 0.0838 + 0.0335 = 0.1173$ or 11.73%

40. The Empire Bank of Canada Ltd is planning to issue some preferred shares. These preferred shares pay a constant annual dividend of $4 per share, which will remain in place for the foreseeable future. Since this is considered to be safer investment, the required market rate is only 6 percent. What should be the price of these shares?
A) $72.50
B) $64.68
C) $62.80
D) $66.67
E) $65.25

Empire Bank = $4/0.06 = $66.667

BUSI 2504 – Fall 2015
Section: H
Essentials of Business Finance
Version 4
Mid term test - 90 Minutes

Please respond by completing the Scantron in the usual way **[i.e. fill in your name, student number and exam version number].** If there is a small difference between your calculated answer and the answers provided in the choices, please choose the answer that is closest to your calculation. Please answer all questions. All questions are worth equal marks.

Chapter 1

1. When a company refers to capital budgeting it is referring to:
   A) Making sure it has enough capital on hand to fund its business;
   B) Planning and managing a firm's investment in long term assets;
   C) Budgeting how much profit it will make in a year to add to its capital
   D) None of the above.

2. When a company refers to its capital structure it is referring to:
   A) The mix of debt and equity maintained by a firm;
   B) The quantity of capital it has on hand;
   C) How it is structuring its capital expenditures over time;
   D) Both a) and b);
   E) None of the above.

3. What is the goal of financial management in a publicly traded company?
   A) Making sure there is enough cash flow;
   B) Maximize the current value per share of existing issued shares.
   C) Raising equity to finance the firm;
   D) Increasing dividends
   E) None of the above.

4. When there is a potential conflict of interest between the shareholders and management of a firm, this is known as:
   A) An agency problem;
   B) Unethical behaviour;
   C) A common problem which has no resolution;
   D) A signal that a change of management is needed;
   E) None of the above.

5. The original sale of securities by governments and corporations occurs in the:

   A. Secondary market.
   B. **Primary market.**
   C. Dealer market.
   D. Auction market.
   E. Liquidation market.

6. Some corporations borrow and invest in the market in which short-term debt securities are bought and sold. This market is called:
   A) The stock market;
   B) The money market;
   C) The over the counter market;
   D) The Chicago Mercantile Exchange;
   E) None of the above.

7. The largest financial institutions in Canada tend to be;
    A) Insurance companies;
    B) Banks;
    C) Trust companies;
    D) Stock brokerages;
    E) Mutual funds.

Chapter 5

8. The idea of compound interest is that:
    A) It recognizes the time value of money;
    B) **Interest is earned on the reinvestment of previous interest payments;**
    C) Investments produce a yield;
    D) It only applies to bonds that pay interest;
    E) None of the above;

9. Simple interest is the term used to describe the case where:
    A) Interest is earned only on the initial principal invested;
    B) It is a simpler version of more complicated valuation techniques;
    C) Interest is earned on interest;
    D) Interest is paid annually;
    E) None of the above;

10. Your company has to make a payment of $1,000,000 five years from now. It wants to put some money in an investment now in order to have enough money to make the future payment. If the current interest rate is 8%, how much money does the company have to put aside now to achieve this?
    A) $602,643.25
    B) $670,345.23
    C) $604,686.32
    D) $680,583.20
    E) None of the above

    $PV = 1{,}000{,}000/(1.08)^5 = \$680{,}583.197$

11. If you invest $3,000 today for 12 years at 8% how much interest will you have earned by the end of year 12?
    A) $2,105.85
    B) $7,554.51
    C) $3202.33
    D) 5,770.448
    E) None of the above

    $FV = \$3{,}000(1.08)^{12} = \$7{,}554.51$

12. You are cleaning in the attic of your house, and you find some pennies (copper coins worth $0.01) from the year 1858 (with a picture of Queen Victoria). After looking on the Internet, you find that similar pennies from that year and condition, sell for $110 each. What was the average rate of return on these pennies?
    A) 5.4%
    B) **6.1%**
    C) 6.9%
    D) 4.5%
    E) 6.5%

N = 2015 – 1858 = 157; FV = $110; PV = -$0.01; CPT i/Y = 6.106%	$FV = \$110 = \$0.01(1+ r)^{(2015-1858)}$ $r = (\$110/0.01)^{1/157} - 1 = 1.06106 - 1 = 0.06106$ or 6.1%

13. You are saving to make a down payment on the purchase of a house. So far you have saved $30,035 but you need $60,000. If the interest rate is 7%, how many years will it be until you reach your goal in round years?

A) About 22.5 years
B) About 10.2 years
C) About 13.1 years
D) About 7.7 years
E) None of the above

PV = $30,035; i/Y = 7%; FV = $60,000; CPT n = 10.22 years

14. You are planning to graduate from your business degree in four years, and at that time you wish to buy a BMW motorcycle for $18,000. How much money would you have to invest in a mutual fund that had an expected rate of return of 7 percent?

A) $13,732.11
B) $14,542.50
C) $11,678.25
D) $12,568.95
E) $15,432.22

FV = $18,000; i/Y = 7%; N = 4 CPT PV = -$13,732.1138	FV = PV $(1+r)^t$ = $18,000 = PV $(1.07)^4$ = PV (1.310796) PV = $18,000/1.310796 = $13,732.11

Chapter 6

15. An annuity is:

A) A stream of equal cash flows for a fixed period of time;
B) Any payment stream equally spaced in time;
C) A level stream of cash flows that is paid in perpetuity;
D) A lump sum paid at a future point in time;
E) None of the above.

16. The application of time value of money principles has the effect that:

A) An annuity is always worth (i.e. has a present value) more than the sum of the individual payments that comprise the annuity;
B) The future value of the annuity is always an amount that is less than the present value of the annuity;
C) There is no easy way to calculate the present value of a growing annuity;
D) The value of the annuity (i.e. its present value) moves inversely with changes in the level of interest rates: as interest rates go up, value goes down and as interest rates go down, value goes up;
E) None of the above.

17. Which statement most accurately describes the APR (Annual Percentage Rate);

A) It is the one plus the period rate compounded by the number of periods within the year;
B) It is the one plus the period rate compounded by the number of periods within the year minus 1;
C) It is the period rate multiplied by the number of periods within the year;
D) None of the above.

18. What is the present value of the following set of cash flows over the next four years? Assume an interest rate of 4.5%.

Year	0	1	2	3	4
Cash Flow	-$1200	$150	$250	$750	$800

A) $425.45
B) $500.54
C) $650.61
D) $551.75
E) $611.35

$CF_0 = -1200$; $CF_1 = 150$; $CF_2 = 250$; $CF_3 = 750$; $CF_4 = \$800$
I = 4.5%, NPV = $500.54469

19. You have been told that the applicable interest rate is 7.87% per year infinitely compounded. What is the corresponding EAR?
    A) 8.19%
    B) 6.34%
    C) 9.23%
    D) 6.56%
    E) None of the above

$1+ EAR = e^{0.0787} = 1.08188$; EAR = 0.0819 or 8.19%

20. If the period rate is 1.75% and compounding is quarterly, what is the corresponding EAR?
    A) 7.27%
    B) 6.61%
    C) 7.19%
    D) 8.91%
    E) None of the above

$EAR = (1.0175)^4 - 1 = 1.071859 - 1 = 0.0719$ or 7.19%

Chapter 7 and 7a

21. The terms *face value* or *par value* of an *n* year coupon bond is the following:
    A) The coupon that is paid to investors periodically;
    B) The principal amount of a bond that is repaid at the maturity of the bond;
    C) The value one can obtain through sale of the bond, or its purchase price;
    D) The present value of the amount to be repaid at maturity;
    E) None of the above.

22. Which of the following best describes the term *yield to maturity* for an *n* period bond paying a coupon at rate *r* semiannually?
    A) The coupon rate *r*;
    B) The annualized ratio of the final principal payment divided by current price of the bond;
    C) The EAR that results when 1 plus the coupon rate is compounded to reflect that payments are made semiannually, minus 1;
    D) The interest rate that equates a bond's present value of future payments to its price;
    E) None of the above.

23. *The Financial Post* lists a bond with the following information: The bond has a closing price of 96.96, a coupon of 6.500, maturity date of May 09/10 and Yld% of 6.51%. Which one of the following statements about this bond is correct?
    A. The closing price of the bond on the prior trading day was $1,096.96.
    B. The bond matures in 2009.
    C. **The yield to maturity is 6.51%.**
    D. The bond is a premium bond.
    E. Each coupon payment is $65.00.
    ANSWER: C

24. All other factors being equal, if the yield to maturity is [Blank #1] a bond's coupon rate, then the bond will trade at [Blank #2] compared to its face value. If the yield to maturity is [Blank #3] the bond's coupon rate, then the bond will trade at [Blank #4] compared to its face value. If the yield to maturity is [Blank #5] the bond's coupon rate, then the bond will trade at [Blank #6] compared to its face value.
    A) (1) less than, (2) a discount; (3) greater than, (4) a premium; (5) equal to, (6) higher

B) (1) equal to, (2) equal to, (3) less than, (4) a premium, (5) greater than, (6) a discount
C) (1) equal to, (2) a premium, (3) greater than, (4) a discount; (5) less than, (6) a premium
D) (1) greater than, (2) equal; (3) less than, (4) a premium; (5) equal to, (6) a discount
E) (1) less than, (2) equal; (3) equal to, (4) a discount; (5) greater than, (6) a premium
ANSWER: B

25. You earn a 5% real return. If the inflation rate is 4%, what is your exact nominal return?
A. 0.96%.
B. 1.09%.
C. 9.00%.
D. 9.20%.
E. 10.92%.
ANSWER: D
1+R = (1.05)(1.04) = 1.092; R = 0.092 or 9.2%

26. Plotting a yield curve can involve determining the discount rates for zero coupon bonds. The observed prices for $1,000 face value 4 and 5-year maturity zero-coupon bonds are $731.77 and $666.58 respectively. What are the discount rates corresponding to these maturities?
A) 7.23% and 7.95%
B) 7.55% and 8.19%
C) 8.12% and 8.45%
D) 9.12% and 9.37%
E) None of the above

$R_{4yr} = (FV/PV)^{1/4} - 1 = 1.36654^{1/4} - 1 = 1.0812 - 1 = 0.0812$ or 8.12%
$R_{5yr} = (FV/PV)^{1/5} - 1 = 1.500195^{1/5} - 1 = 1.0844999 - 1 = 0.0845$ or 8.45%

27. One year ago today, a $1,000 face value, 6% coupon (semi-annual) bond was selling for $1,100. It had 5 years until maturity. What was its Yield to Maturity at that time?
A) 4.55%
B) 6.78%
C) 2.48%
D) 3.79%
E) 5.11%

Yield Year Ago
FV = 1000; PV=-1100; PMT = 60/2 =30; N=5*2 = 10; CPT i/Y = 1.8930
Market Yield = 1.8930 * 2 = 3.78559 or 3.79%

28. A zero coupon bond has a remaining term of 15 years. The nominal market yield is 3.5% (compounded semi-annually). What price should this bond be selling for?
A) $975
B) $456
C) $655
D) $356
E) $594

Bond B = $1000(1.0175)$^{-30}$ = $594.24764
FV = 1000; PMT = 0; I/Y=3.5/2=1.75%; N=15*2 = 30
CPT PV = $594.25

29. A bond pays annual coupons of $23, and it has 5 years until it matures. The current market yield is 3.5%. Approximately, what would this bond's MacCauley Duration value in years?
A) 3.75
B) 3.95
C) 4.77
D) 4.95
E) 5.21

N	CF	PV Factor	N * CF * PV

1	$23	0.966183575	$22.22
2	$23	0.9335107	$42.94
3	$23	0.901942706	$62.23
4	$23	0.871442228	$80.17
5	$1,023	0.841973167	$4,306.69
			$4,514.26
	Bond Price		$945.82
	McCauley Duration		4.772859735

30. Based on the result from the previous question, what would be the Modified Duration for this bond?

A) 6.25
B) 4.61
C) 2.56
D) 3.98
E) 5.25

	CF	PV Factor	N * CF * PV
	$23	0.966183575	$22.22
	$23	0.9335107	$42.94
	$23	0.901942706	$62.23
	$23	0.871442228	$80.17
	$1,023	0.841973167	$4,306.69
			$4,514.26
	Bond Price		$945.82
	McCauley Duration		4.772859735
	Modified Duration		4.611458681

Chapter 8

31. Dividend yield is:

A) Net income per share divided by share price;
B) The cash dividend paid divided by the par value of the common share;
C) The nominal coupon rate on a preferred share;
D) A stock's cash dividend divided by its current price;
E) None of the above.

32. Movement in Research (MIR) Inc.'s stocks are currently trading at $51.50 per share on the stock exchange. MIR's stocks are expected to pay a $1.75 annual dividend, next year, and these dividends will grow at a constant rate for the foreseeable future. Assuming that the market requires a rate of return of 9.5 percent on stocks similar to MIR's, what is its expected dividend growth rate (g), based on its current stock price?

A) 5.5%
B) 6.1%
C) 6.7%
D) 4.9%
E) 5.2%

$P = C_1/(R - g) = \$51.50 = \$1.75/(0.095 - g)$
$\$51.50(0.095 - g) = \$1.75$
$0.095 - g = \$1.75/\$51.50$
$0.095 - g = 0.033981$
$g=0.061019$ or 6.1%

33. When valuing common share dividend streams a growth rate is generally assumed because:
    A) It is often the case that firms reinvest some of their profits each year causing the future dividend stream to become larger over time;
    B) It seems like a good idea;
    C) It is management's job to grow the business;
    D) The statement is not true – dividend streams are seldom assumed to grow over time;
    E) None of the above.

34. One condition that must be imposed in order to value dividend streams with growth is the following:
    A) The growth rate must always be greater than the discount rate;
    B) In a perpetual dividend stream the growth rate can only be applied to the first few years;
    C) The discount rate must be larger than the dividend growth rate;
    D) Since a growing perpetual dividend stream cannot be valued, the dividend growth rate must be set to zero;
    E) None of the above.

35. A preferred stock is:
    A) A stock that performs better than common stock, so it is preferred over common stock;
    B) Another name for debt;
    C) Stock with dividend priority over common stock, normally with a fixed dividend rate, often without voting privileges;
    D) None of the above.

36. A common stock is:
    A) A stock that pays a fixed dividend expressed as a percentage of its face or par value;
    B) A stock that trades on many markets so it can be commonly found;
    C) A share in equity that does not pay a dividend;
    D) Equity without priority in bankruptcy;
    E) None of the above.

37. PineApple Computers Inc. has just released its new jPad tablet and it is experiencing huge demand for this revolutionary product. Recently, it paid a $3.00 annual dividend. Market analysts expect the company's dividends to grow at a supernormal rate of 25% for next three years. After these three years of supernormal growth, PineApple's dividends are expected to grow at a normal rate of 4% indefinitely. Shares similar to PineApple have an expected market required return of 12%. What should be the estimated selling price of PineApple's shares?

    A) $55.75
    B) $65.47
    C) $62.75
    D) $58.90
    E) $70.65

$P_3 = \$3(1.25)^3(1.04)/(0.12-0.04) = \$76.171875$
$P_0 = [\$3(1.25)/1.12] + [\$3(1.25)^2/1.12^2] + [(\$76.171875 + \$3(1.25)^3)/1.12^3]$
$= [\$3.75/1.12] + [\$4.6875/1.12^2] + [(\$76.171875 + \$5.8594)/1.12^3]$
$= \$3.75/1.12 + \$4.6875/1.12^2 + \$82.03125/1.12^3$
$= 3.34821 + 3.7368 + 58.3882$
$= \$65.47328$

38. A company pays a dividend every year. Just now it paid a dividend of $4.00. The dividend is expected to grow at a rate of 5% per year. What is the value per share if the relevant discount rate is 14% per year?
    A) $50.00
    B) $52.00
    C) $46.67
    D) $44.44
    E) None of the above

$P = D_0(1+g)/(R-g) = \$4(1.05)/(0.14-0.05) = \$4.2/0.09 = \$46.67$

39. Current share price is $35.32 and the dividend due in one year's time is $2.96. It is expected to grow for the foreseeable future at a rate of 3.35%. What is the discount rate that is being used to price this share?
    A) 11.73%
    B) 10.36%
    C) 12.58%
    D) 12.83%
    E) None of the above

$R = [D_1/P_0] + g = [\$2.96/\$35.32] + 0.0335 = 0.1173$ or 11.73%

40. The Empire Bank of Canada Ltd is planning to issue some preferred shares. These preferred shares pay a constant annual dividend of $4 per share, which will remain in place for the foreseeable future. Since this is considered to be safer investment, the required market rate is only 6 percent. What should be the price of these shares?
    A) $72.50
    B) $64.68
    C) $62.80
    D) $66.67
    E) $65.25

Empire Bank = $4/0.06 = $66.667

Questions/ Versions	1	2	3	4
1	A	B	A	B
2	C	A	C	A
3	D	B	D	B
4	C	A	C	A
5	A	B	A	B
6	D	B	D	B
7	D	B	D	B
8	A	B	A	B
9	A	A	A	A
10	C	C	D	D
11	A	A	B	B
12	C	B	C	B
13	B	B	B	B
14	A	A	A	A
15	A	A	A	A
16	D	D	D	D
17	C	C	C	C
18	A	B	A	B
19	D	D	A	A
20	B	C	C	C
21	A	A	A	B
22	D	D	D	D
23	C	B	C	C
24	B	B	B	B
25	D	C	D	D
26	B	C	C	C
27	D	C	D	D
28	E	E	E	E
29	B	C	B	C
30	A	B	B	B
31	D	D	D	D
32	B	B	C	B
33	A	A	A	A
34	C	C	C	C
35	C	C	C	C
36	D	D	D	D
37	B	B	C	B
38	B	C	C	C
39	D	A	A	A
40	D	B	D	D

$$PVIF = \frac{1}{(1+r)^n}$$

Present value of $1.00

Interest rate

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174
2	0.9803	0.9612	0.9426	0.9246	0.9070	0.8900	0.8734	0.8573	0.8417
3	0.9706	0.9423	0.9151	0.8890	0.8638	0.8396	0.8163	0.7938	0.7722
4	0.9610	0.9238	0.8885	0.8548	0.8227	0.7921	0.7629	0.7350	0.7084
5	0.9515	0.9057	0.8626	0.8219	0.7835	0.7473	0.7130	0.6806	0.6499
6	0.9420	0.8880	0.8375	0.7903	0.7462	0.7050	0.6663	0.6302	0.5963
7	0.9327	0.8706	0.8131	0.7599	0.7107	0.6651	0.6227	0.5835	0.5470
8	0.9235	0.8535	0.7894	0.7307	0.6768	0.6274	0.5820	0.5403	0.5019
9	0.9143	0.8368	0.7664	0.7026	0.6446	0.5919	0.5439	0.5002	0.4604
10	0.9053	0.8203	0.7441	0.6756	0.6139	0.5584	0.5083	0.4632	0.4224
11	0.8963	0.8043	0.7224	0.6496	0.5847	0.5268	0.4751	0.4289	0.3875
12	0.8874	0.7885	0.7014	0.6246	0.5568	0.4970	0.4440	0.3971	0.3555
13	0.8787	0.7730	0.6810	0.6006	0.5303	0.4688	0.4150	0.3677	0.3262
14	0.8700	0.7579	0.6611	0.5775	0.5051	0.4423	0.3878	0.3405	0.2992
15	0.8613	0.7430	0.6419	0.5553	0.4810	0.4173	0.3624	0.3152	0.2745
16	0.8528	0.7284	0.6232	0.5339	0.4581	0.3936	0.3387	0.2919	0.2519
17	0.8444	0.7142	0.6050	0.5134	0.4363	0.3714	0.3166	0.2703	0.2311
18	0.8360	0.7002	0.5874	0.4936	0.4155	0.3503	0.2959	0.2502	0.2120
19	0.8277	0.6864	0.5703	0.4746	0.3957	0.3305	0.2765	0.2317	0.1945
20	0.8195	0.6730	0.5537	0.4564	0.3769	0.3118	0.2584	0.2145	0.1784
21	0.8114	0.6598	0.5375	0.4388	0.3589	0.2942	0.2415	0.1987	0.1637
22	0.8034	0.6468	0.5219	0.4220	0.3418	0.2775	0.2257	0.1839	0.1502
23	0.7954	0.6342	0.5067	0.4057	0.3256	0.2618	0.2109	0.1703	0.1378
24	0.7876	0.6217	0.4919	0.3901	0.3101	0.2470	0.1971	0.1577	0.1264
25	0.7798	0.6095	0.4776	0.3751	0.2953	0.2330	0.1842	0.1460	0.1160
30	0.7419	0.5521	0.4120	0.3083	0.2314	0.1741	0.1314	0.0994	0.0754
40	0.6717	0.4529	0.3066	0.2083	0.1420	0.0972	0.0668	0.0460	0.0318
50	0.6080	0.3715	0.2281	0.1407	0.0872	0.0543	0.0339	0.0213	0.0134
60	0.5504	0.3048	0.1697	0.0951	0.0535	0.0303	0.0173	0.0099	0.0057

$$FVIF = (1 + r)^n$$

Future value of $1.00

Period	Interest rate								
	1%	2%	3%	4%	5%	6%	7%	8%	9%
1	1.0100	1.0200	1.0300	1.0400	1.0500	1.0600	1.0700	1.0800	1.0900
2	1.0201	1.0404	1.0609	1.0816	1.1025	1.1236	1.1449	1.1664	1.1881
3	1.0303	1.0612	1.0927	1.1249	1.1576	1.1910	1.2250	1.2597	1.2950
4	1.0406	1.0824	1.1255	1.1699	1.2155	1.2625	1.3108	1.3605	1.4116
5	1.0510	1.1041	1.1593	1.2167	1.2763	1.3382	1.4026	1.4693	1.5386
6	1.0615	1.1262	1.1941	1.2653	1.3401	1.4185	1.5007	1.5869	1.6771
7	1.0721	1.1487	1.2299	1.3159	1.4071	1.5036	1.6058	1.7138	1.8280
8	1.0829	1.1717	1.2668	1.3686	1.4775	1.5938	1.7182	1.8509	1.9926
9	1.0937	1.1951	1.3048	1.4233	1.5513	1.6895	1.8385	1.9990	2.1719
10	1.1046	1.2190	1.3439	1.4802	1.6289	1.7908	1.9672	2.1589	2.3674
11	1.1157	1.2434	1.3842	1.5395	1.7103	1.8983	2.1049	2.3316	2.5804
12	1.1268	1.2682	1.4258	1.6010	1.7959	2.0122	2.2522	2.5182	2.8127
13	1.1381	1.2936	1.4685	1.6651	1.8856	2.1329	2.4098	2.7196	3.0658
14	1.1495	1.3195	1.5126	1.7317	1.9799	2.2609	2.5785	2.9372	3.3417
15	1.1610	1.3459	1.5580	1.8009	2.0789	2.3966	2.7590	3.1722	3.6425
16	1.1726	1.3728	1.6047	1.8730	2.1829	2.5404	2.9522	3.4259	3.9703
17	1.1843	1.4002	1.6528	1.9479	2.2920	2.6928	3.1588	3.7000	4.3276
18	1.1961	1.4282	1.7024	2.0258	2.4066	2.8543	3.3799	3.9960	4.7171
19	1.2081	1.4568	1.7535	2.1068	2.5270	3.0256	3.6165	4.3157	5.1417
20	1.2202	1.4859	1.8061	2.1911	2.6533	3.2071	3.8697	4.6610	5.6044
21	1.2324	1.5157	1.8603	2.2788	2.7860	3.3996	4.1406	5.0338	6.1088
22	1.2447	1.5460	1.9161	2.3699	2.9253	3.6035	4.4304	5.4365	6.6586
23	1.2572	1.5769	1.9736	2.4647	3.0715	3.8197	4.7405	5.8715	7.2579
24	1.2697	1.6084	2.0328	2.5633	3.2251	4.0489	5.0724	6.3412	7.9111
25	1.2824	1.6406	2.0938	2.6658	3.3864	4.2919	5.4274	6.8485	8.6231
30	1.3478	1.8114	2.4273	3.2434	4.3219	5.7435	7.6123	10.063	13.268
40	1.4889	2.2080	3.2620	4.8010	7.0400	10.286	14.974	21.725	31.409
50	1.6446	2.6916	4.3839	7.1067	11.467	18.420	29.457	46.902	74.358
60	1.8167	3.2810	5.8916	10.520	18.679	32.988	57.946	101.26	176.03

$$PVIFA = \frac{1 - 1/(1+r)^n}{r}$$

Present value of an annuity of $1.00 per period

Period	Interest rate								
	1%	2%	3%	4%	5%	6%	7%	8%	9%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833	1.7591
3	2.9410	2.8839	2.8286	2.7751	2.7232	2.6730	2.6243	2.5771	2.5313
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3872	3.3121	3.2397
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	4.1002	3.9927	3.8897
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229	4.4859
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.3893	5.2064	5.0330
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7466	5.5348
9	8.5660	8.1622	7.7861	7.4353	7.1078	6.8017	6.5152	6.2469	5.9952
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101	6.4177
11	10.368	9.7868	9.2526	8.7605	8.3064	7.8869	7.4987	7.1390	6.8052
12	11.255	10.575	9.9540	9.3851	8.8633	8.3838	7.9427	7.5361	7.1607
13	12.134	11.348	10.635	9.9856	9.3936	8.8527	8.3577	7.9038	7.4869
14	13.004	12.106	11.296	10.563	9.8986	9.2950	8.7455	8.2442	7.7862
15	13.865	12.849	11.938	11.118	10.380	9.7122	9.1079	8.5595	8.0607
16	14.718	13.578	12.561	11.652	10.838	10.106	9.4466	8.8514	8.3126
17	15.562	14.292	13.166	12.166	11.274	10.477	9.7632	9.1216	8.5436
18	16.398	14.992	13.754	12.659	11.690	10.828	10.059	9.3719	8.7556
19	17.226	15.678	14.324	13.134	12.085	11.158	10.336	9.6036	8.9501
20	18.046	16.351	14.877	13.590	12.462	11.470	10.594	9.8181	9.1285
21	18.857	17.011	15.415	14.029	12.821	11.764	10.836	10.017	9.2922
22	19.660	17.658	15.937	14.451	13.163	12.042	11.061	10.201	9.4424
23	20.456	18.292	16.444	14.857	13.489	12.303	11.272	10.371	9.5802
24	21.243	18.914	16.936	15.247	13.799	12.550	11.469	10.529	9.7066
25	22.023	19.523	17.413	15.622	14.094	12.783	11.654	10.675	9.8226
30	25.808	22.396	19.600	17.292	15.372	13.765	12.409	11.258	10.274
40	32.835	27.355	23.115	19.793	17.159	15.046	13.332	11.925	10.757
50	39.196	31.424	25.730	21.482	18.256	15.762	13.801	12.233	10.962
60	44.955	34.761	27.676	22.623	18.929	16.161	14.039	12.377	11.048

$$FVIFA = \frac{(1+r)^n - 1}{r}$$

Future value of an annuity of $1.00 per period

	Interest rate								
Period	1%	2%	3%	4%	5%	6%	7%	8%	9%
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2	2.0100	2.0200	2.0300	2.0400	2.0500	2.0600	2.0700	2.0800	2.0900
3	3.0301	3.0604	3.0909	3.1216	3.1525	3.1836	3.2149	3.2464	3.2781
4	4.0604	4.1216	4.1836	4.2465	4.3101	4.3746	4.4399	4.5061	4.5731
5	5.1010	5.2040	5.3091	5.4163	5.5256	5.6371	5.7507	5.8666	5.9847
6	6.1520	6.3081	6.4684	6.6330	6.8019	6.9753	7.1533	7.3359	7.5233
7	7.2135	7.4343	7.6625	7.8983	8.1420	8.3938	8.6540	8.9228	9.2004
8	8.2857	8.5830	8.8923	9.2142	9.5491	9.8975	10.260	10.637	11.028
9	9.3685	9.7546	10.159	10.583	11.027	11.491	11.978	12.488	13.021
10	10.462	10.950	11.464	12.006	12.578	13.181	13.816	14.487	15.193
11	11.567	12.169	12.808	13.486	14.207	14.972	15.784	16.645	17.560
12	12.683	13.412	14.192	15.026	15.917	16.870	17.888	18.977	20.141
13	13.809	14.680	15.618	16.627	17.713	18.882	20.141	21.495	22.953
14	14.947	15.974	17.086	18.292	19.599	21.015	22.550	24.215	26.019
15	16.097	17.293	18.599	20.024	21.579	23.276	25.129	27.152	29.361
16	17.258	18.639	20.157	21.825	23.657	25.673	27.888	30.324	33.003
17	18.430	20.012	21.762	23.698	25.840	28.213	30.840	33.750	36.974
18	19.615	21.412	23.414	25.645	28.132	30.906	33.999	37.450	41.301
19	20.811	22.841	25.117	27.671	30.539	33.760	37.379	41.446	46.018
20	22.019	24.297	26.870	29.778	33.066	36.786	40.995	45.762	51.160
21	23.239	25.783	28.676	31.969	35.719	39.993	44.865	50.423	56.765
22	24.472	27.299	30.537	34.248	38.505	43.392	49.006	55.457	62.873
23	25.716	28.845	32.453	36.618	41.430	46.996	53.436	60.893	69.532
24	26.973	30.422	34.426	39.083	44.502	50.816	58.177	66.765	76.790
25	28.243	32.030	36.459	41.646	47.727	54.865	63.249	73.106	84.701
30	34.785	40.568	47.575	56.085	66.439	79.058	94.461	113.28	136.31
40	48.886	60.402	75.401	95.026	120.80	154.76	199.64	259.06	337.88
50	64.463	84.579	112.80	152.67	209.35	290.34	406.53	573.77	815.08
60	81.670	114.05	163.05	237.99	353.58	533.13	813.52	1253.2	1944.8

Equations

Basic factors:

$$PVIF = 1 \Big/ (1+r)^n$$

$$FVIF = (1+r)^n$$

$$PVIFA = \frac{1 - 1 \Big/ (1+r)^n}{r}$$

$$FVIFA = \frac{(1+r)^n - 1}{r}$$

Dividend growth model:

$$V = \frac{D_1}{r-g} = \frac{D_o(1+g)}{r-g}$$

Compounding:

$$EAR = \left(1 + r_p\right)^n - 1$$

$$r_p = \left(1 + EAR\right)^{1/n} - 1$$

Continuous Compounding

$\mathbf{1 + EAR = e^r}$

where "r" is the APR

Zero coupon bonds with $1.00 face value:

For forward interest rates r_1 for year 1, r_2 for year 2 and so on:

$$ZCB_1 = \frac{1}{(1+r_1)}$$

$$ZCB_2 = \frac{ZCB_1}{(1+r_2)}$$

$$PVIFA\ with\ growth = \frac{1 - \left(\frac{1+g}{1+r}\right)^n}{r-g}$$

McCauley Duration

$$D_{McC} = \frac{1}{P_{bond}} \sum_{t=1}^{N} \frac{nCF_n}{(1+r)^n}$$

Modified Duration

$$D_{Modified} = \frac{D_{McCauley}}{(1+r)}$$

Bond:

$$P_0 = C \times PVIFA(r_{period}, n) + FV \times PVIF(r_{period}, n)$$

Preferred Share:

$$P_0 = \frac{C}{r}$$

Fisher Effect:

$$1 + r_{Nominal} = (1 + r_{Real}) \times (1 + r_{Inflation}) \approx 1 + r_{Real} + r_{Inflation}$$

APR

$$APR = r_{Period} \times n$$