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ÉCOLE DE GESTION
SCHOOL OF MANAGEMENT

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ADM 2350 | Final Examination | Name: _____
April 20, 2007 | Version #1 Solutions | Student ID #: _____

Section D, Prof. Rentz (Tues. 8:30 AM – 10:00 AM & Fri. 10:00 AM – 11:30 AM)
Section E, Prof. Dodonova
Section F, Prof. Khoroshilov
Section G, Prof. Gandhi
Section H, Prof. Rentz (Tues. 1:00 PM – 2:30 PM & Thurs. 11:30 AM – 1:00 PM)

Statement of Academic Integrity
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Statement to be signed by the student:
I have read the text on academic integrity and I pledge not to have committed or attempted to commit academic fraud in this examination.

Signed:_____

Note: an examination copy or booklet without that signed statement will not be graded and will receive a final exam grade of zero.

General Instructions:

1. Please **CIRCLE YOUR SECTION** and **SIGN** the academic integrity statement above.
2. There are **SIXTEEN** pages and **TWO** parts to this exam.
3. Please put your **Name and Student ID# on ALL SIXTEEN pages**.
4. This is an **open book and open notes exam**. Notes are **any handwritten or printed materials,** including but not limited to, previous assignments, quizzes, and exams plus their solution sets.
5. The use of **scientific and financial calculators is encouraged**.
6. **Laptop computers or any other devices that can be used for communication are NOT permitted**.
7. Please **do NOT take apart the pages** of this exam.
8. You have 3 **hours** to work this exam. In order to finish this exam, **it is highly recommended that students allocate no more than 1 hour to Part I and 2 hours to Part II.**
9. **GOOD LUCK!**

Part I: (1 hour) There are **TWENTY QUESTIONS** in this part of the exam. Each question counts 1 mark. Choose the one answer that **BEST** answers each question. No credit is given for a wrong answer, an omitted answer, or more than one answer to a question.

1. Which of the following is **NOT** one of the things that causes a corporation to have a significant advantage over a partnership or a proprietorship?

   a. Limited liability.
   b. Ease of transfer of ownership interest.
   c. Unlimited life.
   d. Elimination of double taxation.
   e. Ability to retain earnings and thus convert income from personal income to capital gains.
   f. Both a. and b.

2. The primary goal of a publicly-owned firm serving its shareholders should be to

   a. Social responsibility.
   b. Maximize EPS.
   c. Minimize the chances of losses.
   d. Long-run survival.
   e. **Maximize shareholder wealth.**
   f. All of the above.

3. Your uncle would like to minimize his **interest rate risk** and **default risk** but would still like to invest in corporate bonds. Which of the possible bonds below best satisfies your uncle's stipulation?

   a. AAA bond with 10 years to maturity.
   b. BBB perpetual bond.
   c. BBB bond with 10 years to maturity.
   d. **AAA bond with 5 years to maturity.**
   e. BBB bond with 5 years to maturity.
   f. AAA perpetual bond.

4. You have just purchased shares in the Health Tech long-term bond fund, which is a mutual fund that invests in long-term corporate bonds. This constitutes a(n)

   a. Direct transfer of funds.
   b. Indirect transfer through an investment dealer.
   c. **Indirect transfer through a financial intermediary.**
   d. Indirect transfer through an over-the-counter market transaction.
   e. Both b. and d.
   f. None of the above.

5. If the discount rate **INCREASES** from 10% to 20%, the present value of a lump-sum to be received 4 years from now

   a. Gets larger without limit.
   b. Stays unchanged.
   c. Gets larger.
   d. Gets smaller without limit.
   e. **Gets smaller.**
   f. Cannot tell from the information provided.

6. One of the basic relationships in interest rate theory is for a given change in yield to maturity, the _____ the time to maturity, the _____ the change in price.

   a. longer; smaller
   b. shorter; greater
   c. shorter; smaller
   d. longer; greater
   e. **Both c. and d.**
   f. Both a. and b.

7. Which of the following is (are) workable assumption(s) for the valuation model, $P_0 = D_1/(k_e - g)$ if it is to give the total present value?

   a. Growth is **NEGATIVE**.
   b. There will be **NO** growth.
   c. The growth rate will **EXCEED** the required return.
   d. The required return is **HIGH** (30%).
   e. All of the above are workable assumptions.
   f. **Answers a., b., and d. are workable assumptions.**

8. Which of the following **MAY** be true concerning debt and equity?

   a. The cost of debt for Firm **A** is **GREATER** than the cost of equity for Firm **A**.
   b. **The cost of debt for Firm A is GREATER than the cost of equity for Firm B.**
   c. The cost of internally generated equity for Firm **A** is **GREATER** than the cost of externally generated equity funds for Firm **A**.
   d. The cost of internally generated equity for Firm **A** is **LESS** than the cost of debt for Firm **A**.
   e. **ALL** of the above **MAY** be **TRUE**.
   f. **NONE** of the above **MAY** be **TRUE**.

9. Typically, the marginal cost of capital (MCC) schedule is either horizontal or rising, which implies that the cost of capital to a firm rises as it raises larger and larger amounts of capital. The rising section of the MCC schedule

   a. Is caused by economies of scale in financing.
   b. Would be eliminated (i.e. the MCC schedule would be horizontal) if the firm retained all of its earnings.
   c. Results from a change in the debt ratio as the firm expands.
   d. Results because the firm's beta increases as the firm expands.
   e. **Results from flotation costs associated with the sale of new common and preferred shares.**
   f. All of the above.

10. The internal rate of return of a **NORMAL** capital investment project

   a. Changes when the project's cost of capital changes.
   b. Is equal to the annual net cash flows divided by the project's cost when the cash flows are an annuity.
   c. Is computed in a manner similar to the computation of the yield to maturity on a bond.
   d. Must exceed the project's cost of capital in order for the firm to accept the investment.
   e. **Both c. and d.**
   f. None of the above.

11. Which of the following accounts is (are) **NOT** part of firm's working capital?

   a. Plant and equipment.
   b. Marketable securities.
   c. Cash.
   d. Accounts payable.
   e. Inventory.
   f. **Both a. and d.**

12. Which of the following statements concerning commercial paper is (are) **TRUE**?

   a. Commercial paper is typically written for terms of one to three months.
   b. Commercial paper is **NOT** listed on a stock exchange.
   c. Commercial paper is sold to money market mutual funds, as well as to other financial institutions and nonfinancial corporations.
   d. Commercial paper is a major source of short-term financing for small firms.
   e. All of the above.
   f. a., b., and c.

13. An unusually high turnover of accounts receivable, which implies a very short average collection period, **COULD** indicate that

a. The firm is **VERY** conservative (tough) in its credit policy.
b. The firm has a **VERY** efficient credit and collection department.
c. Without **ANY** doubt, the credit department is helping to maximize the value of the firm.
d. All of the above.
e. **Both a. and b.**
f. None of the above.

14. Which of the following is (are) commonly regarded as being a credit policy variable(s)?

a. Credit period
b. Collection policy
c. Credit standards
d. Cash discounts
e. **All of the above.**
f. a., b., and c.

15. Which of the following statements concerning drafts is (are) correct?

a. Drafts require the firm to keep **LARGER** balances in the disbursement account.
b. Firms use drafts to speed up cash collection.
c. **When a draft is transmitted to the firm's bank for collection, the bank must present the draft to the firm for acceptance before payment is made.**
d. Drafts are cheaper to use than cheques.
e. All of the above.
f. Both b. and c.

16. A firm's marketable securities portfolio, assumed to be held for liquidity purposes, should be

a. Weighted toward **LONG-TERM** securities because they usually pay higher rates.
b. Weighted toward **SHORT-TERM** securities because they usually pay higher rates.
c. Weighted toward Government of Canada securities to avoid interest rate risk.
d. **Weighted toward SHORT-TERM securities to avoid interest rate risk.**
e. Balanced between long-and short-term securities so as to minimize the effects of either an upward or a downward trend in interest rates.
f. Both c. and d.

17. For a **NORMAL** project, which of the following statements is/are **TRUE**?

a. The NPV will be **POSITIVE** if the IRR is **LESS** than the project's cost of capital.
b. Any project acceptable by the NPV method will also be acceptable by the IRR method.
c. When the IRR equals a project's cost of capital, NPV equals 0.
d. Both a. and b.
e. **Both b. and c.**
f. All of the above.

18. The **DISADVANTGES** of the payback approach include:

a. cash flows after the payback period are ignored in the calculation.
b. Payback ignores the time value of money.
c. Payback fails to provide an objective decision-making criterion.
d. Payback is hard to calculate.
e. All of the above.
f. a., b., and c.

19. If the **EXPECTED** rate of return on a share **EXCEEDS** the **REQUIRED** rate,

a. The share is experiencing supernormal growth.
b. You should **SELL** the share.
c. **You should BUY the share.**
d. Dividends are **NOT** being declared.
e. Both a. and c.
f. Both b. and d.

20. A beta value of 0.5 for a security indicates

a. The security has **AVERAGE** systematic risk.
b. The security has **ABOVE-AVERAGE** systematic risk.
c. The security has **NO** systematic risk.
d. **The security has BELOW-AVERAGE systematic risk.**
e. The security's systematic risk is **TWICE** as high as its **UNSYSTEMATIC** risk.
f. The security's **UNSYSTEMATIC** risk is **TWICE** as high as its systematic risk.

Part II: (2 hours) There are **TEN multiple-choice problems** in this part. Each problem counts 2 marks for a total of 20 marks for this part. **To receive credit for each problem, you must show your work.**

21. You need to start saving for your future education. You will begin studies at age 18, and you will need $40,000 per year at the **END** of each of the next 4 years. Today is your birthday. You will make your first deposit one year from today on your **NEXT** birthday in an account that pays 6% compounded annually. Then you will make an identical deposit on **EACH** succeeding birthday **until you make your last deposit on your 18th birthday**. If an annual deposit of $19,871 will allow you to reach your goal, **what birthday are you celebrating today?**

a. 15
b. 10
c. 14
d. 16
e. 12
f. 11
g. 13

Tabular Approach:

Amount needed at age 18 = $40,000 x $PVIFA_{6\%, 4}$ = $40,000 x 3.465 = $138,600

$19,871 x $FVIFA_{6\%, n}$ = $138,600 $\wedge$ $FVIFA_{6\%, n}$ = $138,600/$19,871 = 6.975

From Table III, p. 710, $FVIFA_{6\%, 6}$ = 6.975 $\wedge$ Age = 18 – 6 = 12

Financial Calculator:

To solve for amount needed at age 18, set P/Y = C/Y = 1, N = 4, I/Y = 6%, PMT = $40,000, FV = 0, and then CPT PV = - $138,604.22.

To find N, set P/Y = C/Y = 1, I/Y = 6%, PV = 0, PMT = $19,871, FV = - $138,604.22, and CPT N = 6. Age = 18 – 6 = 12.

22. GWN Trucking is financing a new truck with a loan of $100,000 to be repaid in 6 annual end-of-year instalments of $21,632. **To the nearest whole percent**, what annual interest rate is the company paying?

a. 7%
b. **8%**
c. 9%
d. 10%
e. 6%
f. 5%
g. None of the above.

Tabular Approach:

$\$21{,}632 \times PVIFA_{i,\,6} = \$100{,}000 \wedge PVIFA_{i,\,6} = \$100{,}000/\$21{,}632 = 4.623$

From Table IV, p. 711, $PVIFA_{8\%,\,6} = 4.623$

Financial Calculator:

Set P/Y = C/Y = 1, N = 6, PV = $100,000, PMT = - $21,632, FV = 0, and CPT I/Y = 8.00%.

23. What is the present value of a triannual perpetuity **DUE** of \$99.30? That is, the triannual payments occur at times t = 0, 3, 6, 9, 12, ... and the effective annual discount rate is 10%.

Hint # 1: An ordinary triannual perpetuity would have payments at times t = 3, 6, 9, 12, … .

Hint #2: This problem requires the calculation of an **effective** three-year discount rate.

a. \$993.00
b. \$300.00
c. \$330.00
d. \$363.00
e. \$331.00
f. **\$399.30**
g. None of the above.

Effective triannual rate = $1.10^3 - 1 = 0.331$ or 33.1%

PV of a triannual perpetuity = \$99.30/0.331 = \$300

PV of a triannual perpetuity **DUE** = \$300 x 1.331 = \$399.30

Alternatively, we see that the triannual perpetuity **DUE** has an additional payment of \$99.30 at t = 0. Thus, the PV of a triannual perpetuity **DUE** = \$99.30 + \$300 = \$399.30.

24. You have just been hired by SATO Industries as a financial analyst. Your predecessor left behind the following financial calculations for the project ALPHA:

Time	t = 0	t = 1	t = 2	t = 3	t = 4
Net Cash Flows	-$100,000	$20,000	$40,000	?	$40,000

NPV @ k = 10% = $1,100 to the nearest dollar

Your new boss wants the NPV calculations done for several different discount rates. Unfortunately, the net cash flow for the third period is unreadable on the computer printout that you received. **To the nearest ten dollars**, what is the missing net cash flow for period 3?

a. $22,540
b. $24,790
c. $27,270
d. **$30,000**
e. $33,000
f. $40,000
g. None of the above.

$$NPV = \$1{,}100 = -\$100{,}000 + \frac{\$20{,}000}{1.1} + \frac{\$40{,}000}{1.1^2} + \frac{?}{1.1^3} + \frac{\$40{,}000}{1.1^4}$$

$$\frac{?}{1.1^3} = \$1{,}100 + \$100{,}000 - \$18{,}181.82 - \$33{,}057.85 - \$27{,}320.54 = \$22{,}539.79$$

$$? = 1.331 \times \$22{,}539.79 = \$30{,}000.46$$

25. Tony's Pizzeria, Inc., has two bond issues outstanding, both selling for $775.92. The first issue has a coupon rate of 9% and 20 years to maturity. The second has an **identical yield to maturity** as the first but only 5 years until maturity. Both issues are payable annually. **To the nearest dollar**, what is the annual coupon interest payment on the second issue?

HINT #1: You may round your calculated YTM on the first issue to the nearest whole percentage point.

HINT #2: If you are **NOT** using a financial calculator, please use the following formula for calculating the approximate YTM.

$$YTM = \frac{\left[I + \left(\frac{(M - P_0)}{n}\right)\right]}{\left[\frac{(2P_0 + M)}{3}\right]}$$

a. $120
b. $49
c. **$58**
d. $32
e. $41
f. $90
g. None of the above.

Approximation Formula and Tabular Approach:

$$YTM = \frac{\left[I + \left(\frac{(M - P_0)}{n}\right)\right]}{\left[\frac{(2P_0 + M)}{3}\right]} = \frac{\left[\$90 + \left(\frac{(\$1{,}000 - \$775.92)}{20}\right)\right]}{\left[\frac{((2)(\$775.92) + \$1{,}000)}{3}\right]} = \frac{((60)(\$90) + (3)(\$1{,}000 - \$775.92))}{[(20)((2)(\$775.92) + \$1{,}000)]}$$

$$YTM = \frac{\$6{,}072.24}{\$51{,}036.80} = 11.90\%$$

To the nearest whole percentage point, the YTM = 12%. Now find the coupon interest on a 5-year bond with a YTM of 12% that sells for $775.92.

$775.92 = (I x $PVIFA_{12\%,5}$)+ ($1,000 x $PVIF_{12\%,5}$) = (I x 3.605) + ($1,000 x 0.567)

I = ($775.92 - $567)/3.605 = $208.92/3.605 = $57.95 or $58 to nearest dollar

Financial Calculator:

Set P/Y = C/Y = 1, N = 20, PV = - $775.92, PMT = $90, FV = $1,000 and CPT I/Y = 12.00%.

Set P/Y = C/Y = 1, N = 5, I/Y = 12%, PV = - $775.92, FV = $1,000 and CPT PMT = $57.84.

26. The Dwindling Oil Company (DOC) expects to pay a $20 per share dividend for fiscal 2007 and fiscal 2008. Thereafter, dividends are expected to **DECLINE** by 5% per year. If investor's require a 10% rate of return, what is a fair market price per share **to the nearest dollar** for DOC's stock at the **BEGINNING** of fiscal 2007.

a. $380
b. $320
c. **$139**
d. $350
e. $200
f. $400
g. None of the above.

$$P_2 = \frac{(\$20)(1-0.05)}{(0.10+0.05)} = \$126.67$$

$$P_0 = \frac{D_1}{(1+k_e)} + \frac{(D_2+P_2)}{(1+k_e)^2} = \frac{\$20}{1.1} + \frac{(\$20+\$126.67)}{1.21} = \$18.18 + \$121.21 = \$139.39$$

27. M&M, Inc., is considering the purchase of a new machine which will **REDUCE** manufacturing costs by $20,000 annually **BEFORE** taxes. The new machine will be in CCA Class 8 with a CCA rate of 20%. The firm expects to sell the machine immediately after the end of its 2-year life for $20,000. **No new equipment in the same CCA will be bought at that time.** The firm must **INCREASE** net working capital by $15,000 when the machine is installed. However, this net working capital will be freed up at the end of the machine's economic life. The firm's marginal tax rate is 40% and it uses a 10% cost of capital to evaluate projects of this nature. If the machine costs $40,000 what is the NPV of the project **to the nearest hundred dollars**?

a. $13,600
b. $12,000
c. $52,200
d. $51,100
e. $1,000
f. $500
g. None of the above.

CCA Formula Method:

Step 1: $20,000 x (1 - .4) x $PVIFA_{10\%,2}$ =	$20,826
Step 2: [1.05/1.10][(0.4)(0.2)($40,000)/(0.1+0.2)] =	$10,182
Step 3: $20,000/$1.1^2$ =	$16,529
Step 4: - [1/1.1^2][(0.4)(0.2)($20,000)/(0.1+0.2)] =	- $4,408
Step 5: $15,000/$1.1^2$ =	$12,397
Step 6: - $40,000 - $15,000 =	- $55,000
NPV =	$526

Cash Flow Analysis Method:

Intermediate Outputs			
Net installed cost	$40,000		
ΔSalvage, t=n	$20,000		
Year	0	1	2
Starting UCC	$0	$40,000	$36,000
CCA	$0	$4,000	$7,200
Ending UCC	$0	$36,000	$28,800
ΔRevenues	$0	$0	$0
ΔOperating costs	$0	-$20,000	-$20,000
ΔNet revenues	$0	$20,000	$20,000

Cash-Flow Outputs			
Year	0	1	2
Net installed cost	$40,000	$0	$0
A-T Δnet revenues	$0	$12,000	$12,000
CCA tax shield t≤n	$0	$1,600	$2,880
ΔNWC	$15,000	$0	-$15,000
ΔSalvage, t=n	$0	$0	$20,000
PV tax shield t>n	$0	$0	$2,347
Net cash flow	-$55,000	$13,600	$52,227
Net present value	$526		
Approx. IRR	10.59%		

28. Consider the following information developed from Beta Inc.'s financial statements for the year 2006.

Average inventory	= $20 million
Average accounts receivable	= $21 million
Average accounts payable	= $20 million
Annual credit sales	= $273.75 million
Cost of sales	= $182.5 million

What were the company's operating and cash conversion cycles in 2006?

a. 68 days, 28 days
b. 68 days, 40 days
c. 40 days, 28 days
d. 28 days, 40 days
e. 28 days, 68 days
f. 40 days, 68 days
g. None of the above.

Inventory conversion period = (Average inventory/Cost of goods sold) x 365 days =
($20M/$182.5M) x 365 days = 40 days

Receivables conversion period = (Average accounts receivable/Annual credit sales) x 365 days =
($21M/$273.75M) x 365 days = 28 days

Operating cycle = Inventory conversion period + Receivables conversion period = 40 days + 28 days = 68 days

Payables deferral period = (Average accounts payable/Cost of goods sold) x 365 days =
($20M/$182.5M) x 365 days = 40 days

Cash conversion cycle = Operating cycle – Payables deferral period = 68 days – 40 days = 28 days

29. A firm's payments policy is to stretch payments to its supplier who sells on terms of 2/10, net 30. Payment is made in 60 days and the cash saved is invested in a money market mutual fund paying 12% interest. This policy is ___ because the firm has a net ___**to the nearest whole percentage point**.

HINT: Use the APR formula below to find the approximate cost of trade credit:

$$APR = \left(\frac{Percentge\ discount}{1 - Percentage\ discount} \right) \times \left(\frac{365}{Credit\ period - Discount\ Period} \right)$$

a. Profitable; gain of 3% interest
b. Profitable; gain of 15% interest
c. **Unprofitable; loss of 3% interest**
d. Unprofitable; loss of 15% interest
e. Profitable; gain of 37% interest
f. Cannot determine from the information provided.
g. None of the above.

$$APR = \left[\frac{discount\%}{(100\% - discount\%)} \right] \times \left[\frac{365}{(Credit\ period - Discount\ period)} \right] = \left[\frac{2\%}{(100\% - 2\%)} \right] \times \left[\frac{365}{(60 - 10)} \right] = 14.90\%$$

30. Gamma Corporation is considering extending credit to a group of potential customers that previously was not viewed as eligible for credit. Using various sources of information, the company expects that for this group, the average collection period would be about 73 days and 10% of the customers in the group will **NOT** pay their bills. Also, the company will need to make $20,000 additional investment in inventory as a result of additional credit sales to the group. The company's required pre-tax rate of return on its current assets investment is 25%. The company has a variable cost ratio of 80%.

What is the break-even level of additional credit sales that the firm would need to justify the extension of credit to the group?

a. $50,000
b. $100,000
c. $200,000
d. $250,000
e. $300,000
f. Cannot determine from the information provided
g. None of the above.

$\Delta S(1 - 0.80) - 0.25 \times 73 \times (\Delta S/365) - 0.10 \times \Delta S - 0.25 \times \$20,000 = 0$

$\Delta S(0.20 - 0.05 - 0.10) = \$5,000$ or $\Delta S = \$5,000/0.05 = \$100,000$