# FIN2004/X
# MID-TERM

*Semester I, 2016/2017*

**INSTRUCTIONS**:

1. This is a restricted open-book examination, consisting of 30 Multiple Choice Questions on **TWELVE** printed pages. You are allowed to refer to TWO A4-sized sheets of printed/written materials and up to two calculators.
2. You are given **80 MINUTES** to complete the examination.
3. Use a **PENCIL** to fully shade the most appropriate answer for each question in the answer sheet provided.
4. Remember to **WRITE ONLY YOUR MATRICULATION NUMBER AND SHADE THE APPROPRIATE BUBBLES** on the MCQ answer sheet as previously instructed.
5. **ANSWER ALL QUESTIONS**. There are no penalties for wrong answers.
6. **NO "SMART" DEVICES OF ANY FORM ARE PERMITTED**.

Use the following information to answer questions #1 – #6:

**Rudy's Pte Ltd**
**2015 and 2016 Balance Sheet**

| | ***2016*** | ***2015*** | | ***2016*** | ***2015*** |
|---|---|---|---|---|---|
| Cash | $135,000 | $150,000 | Accounts Payable | $140,000 | $170,000 |
| Accounts Receivable | ? | 195,000 | Notes Payable | 60,000 | 95,000 |
| Inventory | 70,000 | 85,000 | Total CL | $200,000 | $265,000 |
| Total CA | ? | $430,000 | | | |
| | | | Long-Term Debt | 530,000 | 525,000 |
| Net Fixed Assets | 775,000 | 720,000 | Common Stock | ? | 70,000 |
| | | | Retained Earnings | 430,000 | 290,000 |
| Total Assets | ? | $1,150,000 | Total Liab & Equity | ? | $1,150,000 |

**Rudy's Pte Ltd**
**2016 Income Statement**

| | |
|---|---|
| Sales | $ ? |
| Cost of Goods Sold | 4,100,000 |
| Depreciation Expense | 1,900,000 |
| Earnings before Interest and Tax | ? |
| Interest Expense | 150,000 |
| Taxable Income | ? |
| Less: Taxes (40%) | ? |
| Net Income | $ ? |

You have obtained the financial statements of Rudy's Pte Ltd. However, some pieces of information in the statements are missing. Additionally, you have been given the following ratios for Rudy's Pte Ltd.:

I. **Cash Coverage Ratio in 2016 = 16.00 times**
II. **Long-Term Debt Ratio in 2016 = 53.00%**

1. What is the amount of Interest Tax Shield for 2016?
   a. $60,000
   b. $50,000
   c. $150,000
   d. 0
   e. None of the above choices are correct

**Answer:**

**A. In=terest Tax Shield = $150,000 * 40% = $60,000**

2. What is amount of Net New Borrowing for 2016 (please refer to Net New Borrowing as defined and applied in your class notes)?
   f. $60,000
   g. - $60,000
   h. $30,000
   i. - $30,000
   j. None of the above choices are correct

**Answer:**
**D. - $30,000**

**Net New Borrowing = $60,000 + $530,000 – ($95,000 + $525,000) = -$30,000**

3. What is amount of Cashflow to Creditors for 2016 (please refer to Cashflow to Creditors as defined and applied in your class notes)?
   a. $210,000
   b. $180,000
   c. $90,000
   d. $120,000
   e. None of the above choices are correct

**Answer:**
**B. $180,000**

**Cashflow to Creditors = $150,000 – (-$30,000) = $180,000**

4. What is amount of Dividends paid for 2016?
   a. $70,000
   b. $140,000
   c. $90,000
   d. $120,000
   e. None of the above choices are correct

**Answer:**
**A. $70,000**

**Cash Coverage Ratio = 16.00 times**
**→ (EBIT + Depreciation)/Interest = 16.00**
**→ (EBIT + 1,900,000)/150,000 = 16.00**
**→ EBIT = $500,000**
**→ Net Income = $(500,000-150,000)*(1-0.40) = $210,000**
**→ Dividends = $210,000 – (430,000 – 290,000) = $70,000**

5. What is amount of Cashflow to Stockholders for 2016?
   a. - $330,000

b. $330,000
c. - $100,000
d. $100,000
e. None of the above choices are correct

**Answer:**
**D. $100,000**

**Long-Term Debt Ratio = 53%**
**→ LTD/(LTD + Equity) = 53%**
**→ 530,000/(530,000 + CS + 430,000) = 53%**
**→ CS = $40,000**

**Cashflow to Stockholders = Dividends – Net New Equity**
**= $70,000 – (40,000 – 70,000) = $100,000**

6. What is amount of Cashflow from Assets (CFFA) for 2016 (please refer to Cashflow from Assets, CFFA, as defined and applied in your class notes)?
   a. $340,000
   b. $220,000
   c. $190,000
   d. $170,000
   e. None of the above choices are correct

**Answer:**
**B. $220,000**

**Cashflow from Assets = Cashflow to Creditors + Cashflow to Stockholders – Interest Tax Shield**
**= $180,000 + 100,000 – 150,000*0.4 = $220,000**

7. In a portfolio of two different stocks, which of the following could be true?
   I. The riskiness of the portfolio is less than the riskiness of each individual stock held in isolation.
   II. The riskiness of the portfolio is greater than the riskiness of one of the individual stocks.
   III. The beta of the portfolio is less than the beta of each of the individual stocks held in isolation.
   IV. The beta of the portfolio is greater than the beta of one of the individual stocks.
   V. The return of the portfolio is greater than the return of each of the individual stocks held in isolation.

   a. I, IV and V only
   b. III and IV only
   c. I, II and IV only
   d. II and IV only
   e. II, III and V only

**Answer:**
**C. I, II and IV only**

**The beta and the return of the portfolio is the weighted average of the individual stocks; hence the beta cannot be less than each of the individual betas and the return cannot be greater than each of the individual returns.**

8. Forever True Inc. offers you an investment that pays $100 every month forever after, beginning at the end of this month. If the company's risk profile is such that you require a nominal annual rate of 12% compounded monthly, how much would you pay for the investment?

   a. $9,900
   b. $10,000
   c. $10,100
   d. $11,000
   e. $11,100

**Answer:**
**B. $100/(12%/12) = $100/.01 = $10,000**

9) Which of the following statements concerning the SML and the CML is false?

A) CML and SML both measure risk on the horizontal axis
B) Both may contain both efficient and inefficient portfolios
C) The slope of both may change over time
D) Both have some measure risk versus return
E) The true market portfolio is a completely diversified portfolio

Answer: B

10) Jack Smith owns the following portfolio:

100 shares of JNC @$70/shares with a beta of 1.1
100 shares of XZX @$100/shares with a beta of 0.8
100 shares of ZZZ @$20/shares with a beta of 1.5
100 shares of LZX @$10/shares with a beta of 1.3

If the stock market index produced a return that was 10 percentage points greater than the risk-free rate, how much would Jack's portfolio be expected to outperform the risk-free rate?

A) 11.75%
B) 10.00%
C) 21.75%
D) 25.00%
E) Insufficient information to answer the question

Answer: B

11) Which of the following statements about the market portfolio is false?

A) It has a beta of one
B) It must plot on the security market line (SML)
C) It is a completely diversified portfolio
D) The difference between expected return of the market portfolio and the risk-free rate determines the slope of the SML
E) None of the above statements is false.

ANSWER: E

12) Robert Wong is an analyst who must make specific trade recommendations. Currently T-bills yield 3% and the market portfolio is expected to return 10%. Robert's primary tool for valuing stock is the security market line. He must recommend the purchase of only one of the four stocks below. Which stock is the best choice to purchase?

| | Beta | Expected Return |
|---|---|---|
| Stock A | 0.50 | 6.5% |
| Stock B | 2.20 | 12.4% |
| Stock C | 1.50 | 15.1% |
| Stock D | 0.75 | 7.3% |

A) Buy Stock A
B) Buy Stock B
C) Buy Stock C
D Buy Stock D
E) None of the above since they are overpriced.

ANSWER: C

13) Suppose you borrowed $12,000 at a nominal annual rate of 9% and must repay it in 4 equal installments at the end of each of the next 4 years. How much would you still owe at the end of the first year, after you have made the first payment?

A) $7,636.79
B) $8,038.73
C) $8,461.82
D $8,907.18
E) $9,375.98

| | |
|---|---|
| Interest rate | 9.0% |
| Years | 4 |
| Amount borrowed | $12,000 |

Step 1: Find the PMT $3,704.
Step 2: Find the 1st year's interest
Step 3: Subtract the interest from the payment; this is repayment of principal
Step 4: Subtract the repayment of principal from the beginning amount owed

14) Your uncle has $500,000 invested at a nominal annual rate of 7.5%, and he now wants to retire. He wants to withdraw $40,000 at the beginning of each year, beginning immediately. How many years will it take to exhaust his funds, i.e., run the account down to zero?

A) 23.16
B) 24.38
C) 25.66
D) 27.01
E) 28.44

| | |
|---|---|
| I/YR | 7.5% |
| PV | $500,000 |
| PMT | $40,000 |
| FV | $0.00 |
| **N** | **28.44** |

Answer: E

15) After graduation, you plan to work for Dynamo Corporation for 12 years and then start your own business. You expect to save and deposit $7,500 a year for the first 6 years and $15,000 annually for the following 6 years, with the first deposit being made a year from today. In addition, your grandfather just gave you a $25,000 graduation gift which you will deposit immediately. If the account earns 9% compounded annually, how much will you have when you start your business 12 years from now?

A) $238,176
B) $250,712
C) $263,907
D) $277,797
E) $291,687

Answer: D

There are 3 cash flow streams: the gift and the two annuities. The gift will grow for 12 years. Then there is a 6-year annuity that will compound for an additional 6 years. Finally, there is a second 6-year annuity. The sum of the compounded values of those three sets of cash flows is the final amount.

| | | | Amount at Year 6 | Amount at Year 12 |
|---|---|---|---|---|
| Interest rate | 9.0% | | | |
| 1st annuity | $7,500 | | $56,425 | $94,630 |
| 2nd annuity | $15,000 | | NA | $112,850 |
| Gift | $25,000 | | NA | $70,317 |
| Total years | 12 | | | |
| Annuity years | 6 | Final amt: | **$277,797** | |

16. Given the following:

Stock A standard deviation = 0.45
Stock B standard deviation = 0.32

If Stock A and Stock B are perfectly correlated, which portfolio combination represents the minimum variance portfolio?

A. 100% Stock A
B. 50% Stock A, 50% Stock B
C. 100% Stock B
D. 30% Stock A, 70% Stock B
E. 70%Stock A, 30% Stock B

The trick here is that perfectly correlated means $\rho=+1$. This means there are no benefits to diversification. A portfolio of A and B will have a risk equal to the weighted average of A and B's risk. This being the case, since you want the lowest variance you would put 100% of your money into the stock with the lowest standard deviation, Stock B.

Answer: C

(17) Which of the following statements is **NOT CORRECT**?

(A) An increase in dividend will not reduce the net income of a firm.
(B) Other things being equal, a higher interest expense will result in less net income solely because the firm will have to pay more corporate taxes.
(C) Dividends paid to shareholders are not considered tax-deductible when computing corporate taxes.
(D) A negative free cash flow need not imply that the company is doing badly, especially if the company is rapidly growing.
(E) The market value of a profitable company's common equity is typically higher than its book value partly because assets are recorded at historical cost.

Answer: B

(18) CoolMotor is an electric car company, and its stock return has a standard deviation of 20.5%. GenMotor is another car manufacturer, and its stock return has a standard deviation of 10.6%. Which of the following statements is most CORRECT?

(A) CoolMotor's beta can never be lower than the beta of GenMotor.
(B) GenMotor's beta can never be lower than the market portfolio's beta.
(C) CoolMotor must have a higher total risk than GenMotor.
(D) In equilibrium, CoolMotor will have a higher required return than GenMotor.
(E) The correlation coefficient between CoolMotor and the market portfolio must be higher than the correlation coefficient between GenMotor and the market portfolio.

Answer: C

(19) Which of the following statements is **CORRECT**?

I. In equilibrium, a stock with a zero beta will offer a zero expected return.
II. The beta of a company may change over time.
III. The CAPM true market portfolio has no diversifiable risk.
IV. The beta of U.S. Treasury Bills is zero.

(A) Only statements I and II are correct.
(B) Only statement I, II and III are correct.
(C) Only statements II and III are correct.
(D) Only statements II, III, and IV are correct.
(E) All of the listed statements are correct.

Answer: D

(20) You are negotiating to make an 8-year loan of $55,000 to NeedMoney Corporation. To repay you, NeedMoney will pay you $5,000 at the end of Year 1, $10,000 at the end of Year 2, and $15,000 at the end of Year 3, plus an annual fixed cash flow of $Y at the end of each year from Year 4 through Year 8. You regard 5% (annual compounding) as an appropriate rate of return on this loan. What should be the value of the annual fixed

cash flow? (That is, what is Y?)

(A) $6,515.85
(B) $7,425.33
(C) $7,542.92
(D) $7,627.54
(E) $7,823.58

ANSWER: C
PV of first 3 cash flows = 5,000/1.05 + 10,000/1.05$^2$ + 15,000/1.05$^3$ = 26,789.76
PV of remainder funds to generate annuity of 5 $Ys = 55,000 – 26,789.76
= 28,210.24
$FV_3$ = 28,210.24(1.05)$^3$ = 32,656.88
N=5, I/Y=5, PV=-32,656.88, FV=0, Compute PMT = 7,542.92

(21) Which of the following statements is **NOT CORRECT**?

(A) In this course, we have used "time line" as a graphical representation used to show the timing of all cash inflows and cash outflows.
(B) In compound interest, interest is earned on interest.
(C) In simple interest, interest is not earned on interest.
(D) A cash flow stream of $200 at the end of every month over 12 months is not considered an *ordinary annuity* since the cash flows happen every *month* rather than every *year*.
(E) Effective annual rate is either equal to or greater than the annual nominal rate.

Answer: D

(22) Which of the following options has the highest present value if the effective annual rate is the same and greater than zero for all options?

(A) 10 payments of $600 at the end of every six months
(B) 20 payments of $300 at the end of each quarter
(C) 20 payments of $300 at the beginning of each quarter
(D) 60 payments of $100 at the beginning of each month
(E) 5 payments of $1,200 at the end of each year

ANSWER: C

(23) Which of the following statements is most **CORRECT**?

(A) Every stock inside the market portfolio will have the same market risk.
(B) Adding randomly selected stocks into your portfolio could possibly increase the portfolio's expected rate of return while at the same time reducing the portfolio's unsystematic risk.

(C) A firm cannot make managerial decisions that will affect its beta because its beta is dependent on market conditions and has nothing to do with the firm itself.
(D) The beta of a stock is normally found by regressing past returns of the stock against its industry risk.
(E) Only statements (A) and (B) are correct.

ANSWER: B

(24) Assume that the risk-free rate is 6% and the expected market return is 15%. An investor sees a no-dividend paying stock with a beta of 1.20 currently selling for $25. The investor expects the stock to reach $29 at the end of the year. The stock is _____ so the investor should _____:

(A) overpriced, buy it
(B) overpriced, sell it
(C) underpriced, buy it
(D) underpriced, sell it
(E) None of the above

ANSWER: B

Required return = 6% + 1.2(15% – 6%) = 16.8%
Expected return = ($29 – $25)/$25 = 16%

Expected return < Required return ➔ Stock is overvalued

(25) George bought a new HDTV for $2,800 with his newly received credit card. He learned that the bank charges a nominal annual interest rate of 18%, compounded monthly and that the minimum monthly payment on the credit card is $200. George decides to make the minimum payment each month and make no other purchase with this card. How many months will it be before he pays off this card, assuming that the first payment takes place one month from today? (Round to the nearest month)

(A) 14
(B) 15
(C) 16
(D) 17
(E) 18

ANSWER: C

This is an ordinary annuity with PV = 2,800
I=18%/12, PMT=-200, PV=2800, FV=0, Compute N = 15.8

26. BFF Credit Card Company is offering you credit at the nominal annual rate of 12%, compounded monthly. What is the effective annual rate you would be charged?

a. 11.78%
b. 12.00%
c. 12.22%
d. 12.51%
e. 12.68%

ANSWER: E = (1 + .01)^12 - 1 = 12.68%

27. Sophie Telecommunications just announced it is decreasing its annual dividend from $0.84 per share to $0.55 per share effective immediately. If the dividend yield remains at its pre-announcement level, then you know the stock price:
a. was unaffected by the announcement.
b. increased by $0.29 per share.
c. decreased by $0.29 per share.
d. increased proportionately with the dividend decrease.
e. decreased proportionately with the dividend decrease.

**Answer: E**

28. Suppose you observe the following situation:

| State of Economy | Probability of State of Economy | Rate of Return if State Occurs | |
|---|---|---|---|
| | | Stock A | Stock B |
| Bust | 0.12 | -0.25 | -0.07 |
| Normal | 0.72 | 0.10 | 0.05 |
| Boom | 0.16 | 0.18 | 0.12 |

Assume the capital asset pricing model holds and stock A's beta is greater than stock B's beta by 0.25. What is the reward-to-risk ratio in equilibrium?
a. 7.8 percent
b. 8.5 percent
c. 9.6 percent
d. 11.9 percent
e. 20.0 percent

**Answer:**
**C. 9.6 percent**

**$E(R_A) = 0.12(-0.25) + 0.72(0.10) + 0.16(0.18) = .0708$**
**$E(R_B) = 0.12(-0.07) + 0.72(0.05) + 0.16(0.12) = .0468$**
**$Slope_{SML} = (.0708 - 0.468)/0.25 = 9.6$ percent**

29. Given the information below, which of the following statement/s below is/are true?

| | Expected Return | Beta | Standard Deviation |
|---|---|---|---|
| **Stock F** | 13.2% | 1.25 | 12.4% |
| **Stock G** | 9.3% | 0.70 | 15.6% |

Risk Free Rate = 3.5%; Market Risk Premium = 8.0%

I. Stock F is underpriced and Stock G is overpriced.
II. Stock G has higher unsystematic risk than Stock F.
III. The reward-to-risk ratio for Stock G is more than the reward-to-risk ratio for Stock F.
IV. Stock F has higher CV than Stock G.

a. I and III only.
b. II only.
c. II and III only.
d. III and IV only.
e. None of the above statements are true.

**Answer:**
**C. II and III only.**

**Required Return for Stock F = 3.5% + 1.25*8% = 13.5% → overpriced**
**Required Return for Stock G = 3.5% + 0.7*8% = 9.1% → underpriced**
**CV for Stock F = 12.4%/13.2% = 0.94; CV for Stock G = 15.6%/9.3% = 1.68**
**Stock G has higher total risk but lower market risk → higher unsystematic risk.**
**Reward-to-risk ratio for Stock F = (13.2%-3.5%)/1.25 = 0.0776**
**Reward-to-risk ratio for Stock G = (9.3%-3.5%)/0.70 = 0.0829**

30. Ericsson is 42 years old today and he is planning to save $2,500 per month for retirement, with the first deposit to be made at the end of the month. His investments provide a return of 3.5% per year. He expects to live for 30 years after retirement and would like to withdraw $4,000 each month starting immediately when he retires from this retirement savings account. In how many years can Ericsson afford to retire?

a. 20.43 years
b. 18.97 years
c. 22.34 years
d. 17.90 years
e. 28.41 years

**Answer:**
**A. 20.43 years**

**First, discount the 30-year annuity due of $4,000:**
**N = 360 I = 3.5/12 PMT = 4,000 (BGN) Compute PV = 893,378.05.**
**Use the PV as the FV of the X-year ordinary annuity of $2,500:**
**I = 3.5/12 PMT = -2,500 FV = 893,378.05, Compute N = 245.18 months or 20.43 years**