FIN2704/X

MID-TERM

Semester II, 2018/2019

SOLUTIONS

INSTRUCTIONS:

1. This is a restricted open-book examination, consisting of 30 Multiple Choice Questions on **ELEVEN** printed pages, including this cover page. You are allowed to refer to **ONE** A4-sized sheet of printed/written materials and up to two calculators.
2. You are given **80 MINUTES** to complete the test.
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**.

Please use the below information to answer Questions #1 to #5.

Robbo's Left-Back Training Inc.
2017 and 2018 Balance Sheet

	2018	*2017*		*2018*	*2017*
Cash	$6,000	$5,000	Accounts Payable	$6,300	$5,700
Accounts Receivable	5,600	7,200	Notes Payable	3,400	2,100
Inventory	4,100	5,400	Total CL	$9,700	$7,800
Total CA	$15,700	$17,600			
			Long-Term Debt	12,800	14,500
Net Fixed Assets	34,300	30,400	Common Stock	10,000	10,000
			Retained Earnings	17,500	15,700
Total Assets	$50,000	$48,000	Total Liab & Equity	$50,000	$48,000

Robbo's Left-Back Training Inc.
2018 Income Statement

Sales	$	180,000
Cost of Goods Sold		153,000
Depreciation Expense		12,000
Earnings before Interest and Tax		15,000
Interest Expense		2,000
Taxable Income		13,000
Less: Taxes (40%)		5,200
Net Income	$	7,800

1. What is the amount of "Interest Tax Shield" for 2018 (please refer to interest tax shield as defined and applied in your class notes)?

   a) $1,200
   b) $800
   c) $1,600
   d) $2,000
   e) None of the above choices are correct

Answer: B
Interest tax Shield 2018 = $2,000*0.4 = $800

2. What is amount of Cashflow to Creditors for 2018 (please refer to Cashflow to Creditors as defined and applied in your class notes)?

   a) $2,400
   b) $1,600
   c) $400
   d) - $400
   e) None of the above choices are correct

Answer: A
Cashflow to Creditors = Interest Expense – Net New Borrowing
= 2,000 – [(3,400+12,800) – (2,100+14,500)] = $2,400

3. What is amount of Cashflow to Stockholders for 2018 (please refer to Cashflow to Stockholders as defined and applied in your class notes)?

   a) $7,800
   b) $6,000
   c) $1,800
   d) -$3,200
   e) None of the above choices are correct

Answer: B
Dividends = $7,800 – ($17,500 - $15,700) = $6,000
Cashflow to Stockholders = Dividends – Net New Equity = $6,000 – (10,000 – 10,000) = $6,000

4. What is the amount of "Change in NOWC" for 2018 (please refer to NOWC as defined and applied in your class notes)?

   a) $2,500
   b) - $3,800
   c) $3,800
   d) - $2,500
   e) None of the above choices are correct

Answer: D
Change in NOWC 2018 = (15,700 – 6,300) – (17,600 – 5,700) = –$2,500

5. What is the amount of Cash Flow From Assets (CFFA) for 2018 (please refer to CFFA as defined and applied in your class notes)?

   a) $7,600
   b) $8,900
   c) $10,400
   d) $11,700
   e) None of the above choices are correct

Answer: A
CFFA = OCF – NCS – Change in NOWC
= [(15,000)*(1-0.4) + 12,000] – (34,300 – 30,400 + 12,000) – (-2,500)
= 21,000 – 15,900 + 2,500 = $7,600
***or* CFFA = Cashflow to Creditors + Cashflow to Shareholders – Interest tax shield**
= $2,400 + 6,000 – 800 = $7,600

6. You would like to have $500,000 in savings, 5 years from today. You are able to earn a 2% APR with monthly compounding, on your deposits. How much of your salary do you need to set aside each month, with the first allocation made at the end of this month, in order to reach your savings goals?

a) $5,995.55
b) $6,740.55
c) $7,930.55
d) $8,210.55
e) $8,570.55

Answer: C

N = 60; I = 0.16666667%; FV = $500,000 PV=0; cpt PMT
PMT = $7930.55

7. You have decided to invest $500,000 of your own funds in the market portfolio. You have also borrowed $200,000 at the risk free rate and then invested all of those borrowed funds, also in the market portfolio. What is the Beta of your portfolio?

a) 0.7
b) 1.0
c) 1.2
d) 1.4
e) 1.6

Answer: D

Beta of portfolio = -2/5 *(0) + 7/5 *(1) = 1.4

8. Fabinho Bank offers interest on deposits at a rate of 3 percent per year, compounded monthly. Assuming you place $5,000 into an account with the bank and make no subsequent deposits or withdrawals, how much would your account balance be at the end of the first six months?

a) $5,050.55
b) $5,075.47
c) $5,098.48
d) $5,103.76
e) $5,109.32

Answer: B

After the first six months, the balance will be: FV = $5,000 $[1 + (0.03/12)]^6$ = $5,075.47

9. You receive a credit card invitation from ManeMane Bank offering an introductory rate of 3% APR, compounded monthly for the first six months, increasing thereafter to 24% APR, compounded monthly. Assuming that today you decide to transfer the $5,000 balance from your existing credit card to ManeMane Bank and then make no subsequent payments, how much interest would you owe Mane Mane at the end of the first year?

a) $1,019
b) $835
c) $792
d) $716
e) $684

Answer: D

After the first six months, the balance will be: FV = $5,000 [1 + (0.03/12)]^6 = $5,075.47
The FV in another six months will be: FV = $5,075.47 [1 + (0.24/12)]^6 = $5,715.80
The interest accrued is: Interest = $5,715.80 – 5,000.00 = $715.80

10. You have just arranged for a $1 million amortized loan. The stated rate is 4%, annual compounding and it calls for equal yearly instalments over 3 years. How much total interest would you be paying on the loan over its three year life?

a) $125,509
b) $120,000
c) $81,046
d) $54,964
e) $30,000

Answer: C

N = 3; I = 4%; PV = $1,000,000; cpt PMT
PMT = $360,348.54

Year	Beginning Principal	Instalment	Interest	Principal Paid	Ending Principal
1	$1,000,000	$360,348.54	$40,000	$320,348.54	$679,651.46
2	$679,651.46	$360,348.54	$27,186.06	$333,162.48	$346,488.98
3	$346,488.98	$360,348.54	$13,859.56	$346,488.98	$0
		TOTAL	$81,045.62		

11. One year ago, you purchased shares of WanChai Inc. at a price of $20 per share. Today, after receiving a dividend per share of $_____, you sold your shares at $22.50. Your total return on these shares is 15%. How much dividend per share did you receive?

a) You did not receive any dividend
b) $0.88
c) $0.75
d) $0.63
e) $0.50

Answer: E

(22.50 – 20 + D) / 20 = 0.15 → D = $0.50

12. What is the standard deviation of returns of a portfolio comprising $8,000 of stock S and $2,000 of stock T?

State of Economy	Probability of State of Economy	Return if State Occurs	
		Stock S	Stock T
Boom	30%	50%	35%
Normal	70	-5	5

a) 15 percent
b) 26 percent
c) 23 percent
d) 19 percent
e) 5 percent

Answer: C

$E(r)_{Boom}$ = [$8,000/($8,000 + $2,000)][0.5] + [($2,000/($8,000 + $2,000)][0.35] = 0.47
$E(r)_{Normal}$ = [$8,000/($8,000 + $2,000)][-0.05] + [$8,000/($8,000 + $2,000)][0.05] = -0.03
$E(r)_{Portfolio}$ = (0.3 × 0.47) + (0.7 × -0.03) = 0.12
$Var_{Portfolio}$ = [0.3 × (0.47 - 0.12)^2] + [0.7 × (-0.03 - 0.12)^2] = 0.0525
$SD_{Portfolio}$ = SQRT(0.0525) = 22.91%

13. Anand Inc. offers an asset with the following cash flow information. The appropriate discount rate is 3% for years 1-4 and 4% for years 5-8. Payments are received at the end of each year.

Year	Amount
1-4	$16,491
5-8	$12,000

How much are you willing to pay today for the asset with the above cash flow characteristics?

a) $80,000
b) $90,000
c) $100,000
d) $110,000
e) $120,000

Answer: C
PV of year 5-8 annuity

N = 4; I = 4%; PMT = $12,000; cpt PV_0 = $43,558.74
N = 4; I = 3%; FV = 43,558.74; cpt PV_0 = $38,701.38
PV of year 1-4 annuity =
N = 4; I = 3%; PMT = 16,491, cpt PV = $61,298.62;
Total Value = $61,298.62 + $38,701.38 = $100,000

14. Nadia Inc. has a Return on Equity of 14%, Profit Margin of 5% and Total Asset Turnover of 2.0. What is Nadia Inc.'s Equity Multiplier ratio?

    a) 1.0
    b) 1.2
    c) 1.4
    d) 1.6
    e) 1.8

Answer: C

ROE = TATO * PM * EM
EM = 14%/(5%*2) = 1.4

15. The below chart provides information on Gini Inc.'s stock. Find the capital gain yield as well as the dividend yield.

Year	End of Year Price	Dividends Received
0	$30	
1	$31.50	$0.75

    a) Capital Gain Yield = 5%, Dividend Yield = 2.5%
    b) Capital Gain Yield = 5.5%, Dividend Yield = 2.0%
    c) Capital Gain Yield = 7%, Dividend Yield = 0.5%
    d) Capital Gain Yield = 7.5%, Dividend Yield = 1.5%
    e) Insufficient information to derive.

Answer: A

0.75/30 = 2.5%
31.5-30/30 = 5%

16. You currently hold a portfolio comprising 4 assets in equal weights. Asset A has a beta of 1.8; Asset B has a beta of 1.6; Asset C has a beta of 1.2 and Asset D has a beta of 0.7. You decide to sell all of Asset B and replace it with Asset E with a beta of 2.0. By how much did your portfolio beta change?

    a) An increase of 0.4.
    b) A decrease of 0.4.
    c) An increase of 0.1.
    d) A decrease of 0.1.

e) None of the above.

Answer: C

Current portfolio beta = 0.25*1.8 + 0.25*1.6 + 0.25*1.2 + 0.25*0.7 = 1.33
New portfolio beta = 0.25*1.8 + 0.25*2.0 + 0.25*1.2 + 0.25*0.7 = 1.43
Change in portfolio beta = 1.43 – 1.33 = +0.1

17. Given that Stock A and Stock B are both priced correctly, what is the Market Index return, $\mathbf{r_M}$?

	Expected return	**Beta**
Stock A	16%	1.2
Stock B	12	0.8

a) 10%
b) 18%
c) 15%
d) 13%
e) 14%

Answer: E

An asset with a beta of 1.0 can be derived by taking weights of 50% in A and 50% in B.
→ r_M = 50%(16%) + 50%(12%) = 14%

18. Which of the following statement/s is/are most **CORRECT**?

I. A decrease in risk aversion among investors will cause the slope of the SML line to decrease.
II. All portfolios along the efficient frontier of risky assets are fully diversified and offer the return of the market portfolio.
III. Combining 2 perfectly positively correlated assets will always result in a diversification benefit.
IV. According to the Capital Asset Pricing Model, portfolios along the CML (Capital Market line), will always have a lower standard deviation than portfolios along the efficient frontier of risky assets.

a) I only
b) I and II only
c) II and III only
d) II and IV only
e) I and IV only

Answer: A

19. A firm has a current ratio of 1.8. The management subsequently decides to use some of its excess cash to pay down its accounts payables. How will its current ratio change?

    a) The current ratio will increase.
    b) The current ratio will decrease.
    c) The current ratio will remain unchanged.
    d) The current ratio will double.
    e) Cannot be determined.

Answer: A

20. What is the present value of an investment that pays $10,000 once every three years, if the first payment occurs three years from today while the final payment occurs nine years from today and the account earns 3% compounded monthly?

    a) $29,060
    b) $28,875
    c) $27,434
    d) $26,289
    e) $25,131

Answer: E

Effective 3-year rate = [1 + (0.03/12)]^36 – 1 = 9.4051%
N = 3; I = 9.4501; PMT = $10,000; FV=0; cpt PV = 25,131.3

21. Keita Company has Total Assets of $6 million, Accounts Receivable of $350,000, a Profit Margin of 15% and a Return on Assets of 12%. What are Keita's total sales?

    a) $2.7 Million
    b) $2.9 Million
    c) $3.6 Million
    d) $4.8 Million
    e) $5.2 Million

Answer: D

TATO = ROA/PM → TATO = 12%/15% = 0.8
Sales = 0.8*$6 million = $4.8 million

22. Assuming CAPM holds and there is market equilibrium, which of the scenarios would **NOT** be possible?

    A.

Portfolio	Expected Return	Beta
A	30%	1.6
B	25	1.2

B.

Portfolio	Expected Return	Standard Deviation
Risk-free	4%	0
Market	13	24
C	10	16

C.

Portfolio	Expected Return	Standard Deviation
D	20%	35
E	25	25

D. All of the above scenarios are possible.

E. None of the above scenarios are possible.

Answer: D

Choice (a) is possible. Portfolio A has a higher beta than Portfolio B and the expected return for Portfolio A is higher than the expected return for Portfolio B. Based on CAPM, excess return is proportionate to beta.

Choice (b) is possible. The reward-to-total risk ratio for Portfolio C is the same as that of the market. Using the numbers supplied:

$$S_c = \frac{0.10 - 0.04}{0.16} = 0.375; S_m = \frac{0.13 - 0.04}{0.24} = 0.375$$

Portfolio C is on the CML.

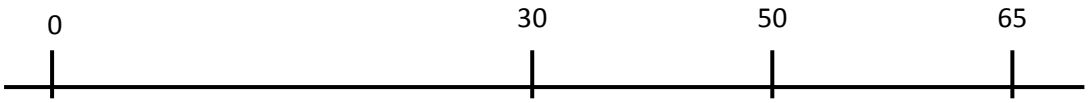
Choice (c) is possible. If the CAPM is valid, the expected rate of return compensates only for systematic (market) risk, represented by beta, rather than for the standard deviation, which includes nonsystematic risk. Thus, Portfolio D's lower rate of return can be paired with a higher standard deviation, as long as D's beta is less than E's.

23. Virgil Van is 25 years old today and he plans to retire in 30 years. He expects to live for 35 years after retirement. Upon retiring, Virgil Van would like to withdraw $4,000 at the beginning of each month for the first 20 years of his retirement and then $5,000 at the beginning of each month for the remaining 15 years. Assuming an APR of 6%, with

monthly compounding, how much does Virgil Van need to have saved on the date of retirement, 30 years from now?

a) $1,000,000
b) $907,836
c) $843,758
d) $741,007
e) $620,000

Answer: D



Find PV of first 20 years of withdrawals using BEG mode:
N = 240; I=6/12; PMT = $4,000; cpt PV = $561,114.70

Find PV of final 15 years of withdrawals using BEG mode:
N = 180; I=6/12; PMT = $5,000; cpt PV = $595,480.16

Value of this amount at end of year 30:
N = 240; I=6/12; FV = $595,480.16; cpt PV = $179,892.26

Total amount required for retirement = $561,114.70 + $179,892.26 = $741,006.96

24. Which of the following statement/s below is/are **CORRECT**?

I. The three aspects of cash flows that affect asset value are amount, timing and riskiness.
II. Assuming all costs are internalized by the firm, the goal of financial management varies according to the business industry.
III. Beta measures a stock's systematic risk and is a direct input used to find required return on the stock.
IV. Standard deviation measures a stock's total risk and is a direct input used to find required return on the stock.

a) I and II only.
b) I and III only.
c) I, II and III only.
d) I, III and IV only.
e) All of the statements are correct.

Answer: B

25. You observe the following information regarding the returns of stocks of Company A and Company B:

i. Company A's expected return is twice that of Company B's.
ii. Company A's standard deviation of returns is slightly less than twice that of Company B's.
iii. Company A's beta is twice that of Company B's.

Given this information, which of the following statements is always **INCORRECT**?

a) Company A has more total risk than Company B.
b) Company A has more systematic risk than Company B.
c) Company A has a lower coefficient of variation than Company B.
d) Company A has a higher correlation with the market portfolio than Company B.
e) Given a positive risk-free return, Company A's stock is underpriced and Company B's stock is overpriced.

Answer: E

26. As per your module lecture notes and discussions, which of the following statement/s below is/are most correct?

a) (Rm – Rf) represents the excess return of the market portfolio over the risk free rate.
b) (Rm – Rf) provides a measure of investor's risk aversion.
c) (Rm – Rf) is the slope of the Security Market Line (SML).
d) Only statements A and C are correct.
e) Statements A, B and C are all correct.

Answer: E

27. The beta of Stock Q is 0.8. There is an equal chance that the economy booms or goes into recession. If the economy booms, Stock Q will return 30% but if the economy goes into recession, Stock Q will return -10%, and Stock Q's current price reflects these return probabilities. The risk-free rate of return is 1% and the market return is 12%. Assuming that CAPM holds, which one of the following statements is true given this information?

a) The stock has more systematic risk than the overall market.
b) The standard deviation of Stock Q's returns is 20%.
c) There will be more sellers than buyers for Stock Q in the market. .
d) Both statements A and C are correct.
e) Both statements B and C are correct.

Answer: B

E(r) = 0.5*30% + 0.5*(-10%) = 10%;
Stdev = SQRT[(30%-10%)^2*0.5 + (-10%-10%)^2*0.5] = 20%
Required r = 1% + 0.8*(12% - 1%) = 9.8%.
Since Expected r > Required r, Stock Q will plot above the SML → underpriced hence more buyers than sellers.

28. Jamie puts $50,000 into a deposit product for 10 years. Josh puts $100,000 in the same deposit product for 7 years. Both Jamie and Josh withdraw the same amount of money. What is the annually compounded interest rate that this deposit product earns?

    a) 43%
    b) 20%
    c) 31%
    d) 17%
    e) 26%

Answer: E

$50{,}000*(1+i)^{10} = 100{,}000*(1+i)^7$
$(1+i)^3 = 100{,}000/50{,}000 = 2 \rightarrow i = 26\%$

29. Asset A has an expected return of 15% and standard deviation of returns of 45%. Asset B has an expected return of 10% and standard deviation of returns of 22%. You invest in a portfolio comprising a mix of Asset A and Asset B in weights such that the portfolio has an expected return of 12.5% and a standard deviation of returns of 32%. What is the correlation coefficient between Asset A and Asset B?

    a) 80%
    b) 75%
    c) 70%
    d) 65%
    e) None of the above

Answer: A

Since the portfolio return is 12.5%, we know that the weight in Asset A and the weight in Asset B is 50% each.
$\rightarrow 0.32^2 = 0.5^2*0.22^2 + 0.5^2*0.45^2 + 2*0.5*0.5*0.22*0.45*rho_{AB}$
$\rightarrow rho_{AB} = 0.039675/0.0495 = 0.802$

30. You are considering purchasing a new television set for $12,000. The sales manager offers two payment schemes. Plan A is a semi-annual instalment plan of $3,200 every six months for two years. Plan B is a monthly instalment plan of $1,050 each month for one year. What is the difference in the effective annual rates of the two payment schemes?

    a) Plan A's EAR is lower than Plan B's EAR by 4.16%.
    b) Plan A's EAR is lower than Plan B's EAR by 3.84%.
    c) Plan B's EAR is lower than Plan A's EAR by 2.64%.
    d) Plan B's EAR is lower than Plan A's EAR by 1.87%.
    e) Both plans have the same EAR.

Answer: A

PV = $12,000; PMT = $3,200; N = 4; cpt I/Y = 2.6325%
→ EAR of Plan A = (1 + 2.6325%)^2 – 1 = 5.334%

PV = $12,000; PMT = $1,050; N = 12; cpt I/Y = 0.7587%
→ EAR of Plan B = (1 + 0.7587%)^12 – 1 = 9.494%

Difference is 9.494% - 5.334% = 4.16% (Plan A is lower than Plan B)