FIN2704/X

MID-TERM

Semester I, 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.

Vicky's DIY Company
2017 and 2018 Balance Sheet

	2018	*2017*		*2018*	*2017*
Cash	$200,000	$250,000	Accounts Payable	$160,000	$140,000
Accounts Receivable	140,000	120,000	Notes Payable	125,000	110,000
Inventory	120,000	90,000	Total CL	$285,000	$250,000
Total CA	460,000	$460,000			
			Long-Term Debt	255,000	270,000
Net Fixed Assets	550,000	520,000	Common Stock	130,000	130,000
			Retained Earnings	340,000	330,000
Total Assets	1,010,000	$980,000	Total Liab & Equity	1,010,000	$980,000

Vicky's DIY Company
2018 Income Statement

Sales	$	1,200,000
Cost of Goods Sold		960,000
Depreciation Expense		100,000
Earnings before Interest and Tax		140,000
Interest Expense		40,000
Taxable Income		100,000
Less: Taxes (40%)		40,000
Net Income	$	60,000

You have obtained the financial statements of Vicky's DIY Company. All of the cash is used in the company's operations (i.e., there is no excess cash).

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. $1,500
   B. $2,400
   C. $9,333
   D. $16,000
   E. None of the above choices are correct

Answer: D
Interest tax Shield 2018 = $40,000*0.4 = $16,000

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

   A. $40,000
   B. - $40,000
   C. $0
   D. - $25,000
   E. None of the above choices are correct

Answer: A
Cashflow to Creditors = Interest Expense – Net New Borrowing
= 40,000 – [(125,000+255,000) – (110,000+270,000)] = $40,000

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

   A. $10,000
   B. $50,000
   C. $40,000
   D. -$10,000
   E. None of the above choices are correct

Answer: B
→ Net Income = $60,000
→ Retained Earnings 2018 = 340,000
Dividends = $60,000 – ($340,000 - $330,000) = $50,000
Cashflow to Stockholders = Dividends – Net New Equity
= $50,000 – (130,000 – 130,000) = $50,000

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

   A. $20,000
   B. - $35,000
   C. $35,000
   D. - $20,000
   E. None of the above choices are correct

Answer: D
Change in NOWC 2018 = (460,000 – 160,000) – (460,000 – 140,000) = –$20,000

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. $89,000
   B. $79,000
   C. $74,000
   D. $94,000
   E. None of the above choices are correct

Answer: C
CFFA = OCF – NCS – Change in NOWC
= [(140,000)*(1-0.4) + 100,000] – (550,000 – 520,000 + 100,000) – (-20,000)

= 184,000 – 130,000 + 20,000 = $74,000
***or* CFFA = Cashflow to Creditors + Cashflow to Shareholders – Interest tax shield**
= $40,000 + 50,000 – 16,000 = $74,000

6. Srini Inc. has a return on equity of 15%. The receivables turnover is 3.75 times and the profit margin is 12%. The total equity is $1.5 million. What is the amount of Receivables the firm has?

   A. $1,875,000
   B. $1,250,000
   C. $500,000
   D. $375,000
   E. $50,000

Answer: C

Net Income = 15%*1,500,000 = $225,000
Sales = 225,000/0.12 = $1,875,000
Receivables = 1,875,000/3.75 = 500,000

7. Which of the following statements about the alternative forms of business organization is/are correct?

   I. Income earned by a sole proprietor is taxed as personal income tax.
   II. In a partnership, there is separation between owners and managers.
   III. All partners in a limited partnership have limited liability.
   IV. For corporations, the separation of owners and managers is always an advantage.

   A. I only.
   B. II only.
   C. II and III only.
   D. III and IV only.
   E. IV only.

Answer: A

8. Today, just after receiving a dividend per share of $0.40, you sold 100 shares of Firmino Inc. stock. You originally purchased the shares exactly one year ago at a price of $44 per share. Your total return on these shares is 10%. What was Firmino Inc.'s stock price today when you sold the shares?

   A. $50
   B. $48
   C. $46
   D. $44

E. $42

Answer: B
(S – 44 + 0.4) / 44 = 0.10
S = 48

9. Which of the following statements is/are most **CORRECT**?

I. A change in expected inflation will cause the slope of the SML line to decrease.
II. A portfolio on the "efficient frontier" would be a portfolio that offers the maximum expected return for a given level of risk.
III. The covariance between two different assets can potentially be negative.
IV. All portfolios along the CML have the same beta.

A. I and II only
B. II and III only
C. II and IV only
D. IV only
E. None of the above statements are correct

Answer: B

10. You have just won a Liverpool FC raffle. The prize entitles you to receipt of £1.50 every month forever, with the first payment today. The relevant discount rate is a nominal 12%, with monthly compounding. What is the value of this raffle prize?

A. £150.0
B. £150.5
C. £151.5
D. £155.0
E. £155.5

Answer: C
12%/12 = 1%

1.5/.01 = 150 + 1.5 = 151.5

11. What is the standard deviation of returns on a portfolio comprising $5,500 of stock G and $4,500 of stock H?

State of Economy	Probability of State of Economy	Return if State Occurs	
		Stock G	Stock H
Boom	25%	16%	10%
Normal	75	10	8

A. 0 percent

B. 3.46 percent
C. 13.49 percent
D. 1.64 percent
E. 1.82 percent

Answer: E

$E(r)_{Boom}$ = [$5,500/($5,500 + $4,500)][0.16] + [($4,500/($5,500 + $4,500)][0.10] = 0.133
$E(r)_{Normal}$ = [$5,500/($5,500 + $4,500)][0.1] + [$4,500/($5,500 + $4,500)][0.08] = 0.091
$E(r)_{Portfolio}$ = (0.25 × 0.133) + (0.75 × 0.091) = 0.1015
$Var_{Portfolio}$ = [0.25 × (0.133 - 0.1015)^2] + [0.75 × (0.091 - 0.1015)^2] = 0.00033075
$SD_{Portfolio}$ = SQRT(0.0003075) = 1.82%

12. You are given the following cash flow information for an asset. The appropriate annual discount rate is 2.5% for years 1-4 and 4% for years 5-8. Payments are received at the end of each year.

Year	Amount
1-4	$10,000
5-8	$12,000

What should you be willing to pay right now to receive the income stream above?

A. 68,890.77
B. 72,592.80
C. 75,550.43
D. 77,081.81
E. 81,721.21

Answer: D

N = 4; I = 2.5%; PMT = $10,000; cpt PV_0 = -$37,619.74

N = 4; I = 4%; PMT = $12,000; cpt PV_0 = -$43,558.74
N = 4; I = 2.5%; FV = 43,558.74, cpt PV = -$39,462.07

Total = 77,081.81

13. You have invested $200,000 of your own money in the market portfolio. You then borrowed $120,000 from your broker, at the risk free rate of 4%, and invested that in the market portfolio as well. The market risk premium is 5%. What is the required rate of return on your portfolio?

A. 14.1%
B. 10.0%
C. 9.3%

D. 13.5%
E. 12.0%

Answer: E
Beta of Portfolio = (-120,000/200,000) *0 + (320,000/200,000)*1 = 1.6
Required Return = 4% +1.6*5% = 12%

14. You are examining a firm's performance by analyzing its financial statements. If you would like information about its earning ability, *irrespective of its financing choices*, what is the ***best*** ratio to consider from the choices below?

A. ROE
B. Profit Margin
C. BEP
D. Current Ratio
E. Inventory Turnover

Answer: C
ROE = Net Income/Equity
Profit Margin = Net Income/Sales
BEP = *EBIT*/*Total Assets*
Current Ratio = CA/CL

15. Which of the below statements will **increase** a firm's CFFA for the period (holding all else unchanged)?

A. A decrease in interest expense for the same underlying capital structure
B. An increase in allowed current depreciation expense for the same underlying fixed asset amount
C. A downward revision in the amount of supplier credit offered
D. Both Statements A and B will increase a firm's CFFA
E. None of the above will increase a firm's CFFA

Answer: B

16. Given the information below, and assuming that Stock A and Stock B are priced fairly as per CAPM, what is the market risk premium?

	Expected return	Beta
Stock A	16%	1.2
Stock B	20	1.6

A. 6.5%
B. 7.0%
C. 8.0%

D. 10.0%
E. 12.0%

Answer: D

Gradient of SML= mkt risk premium = (0.2-0.16)/(1.6-1.2) = 10%

17. Assuming CAPM holds and there is market equilibrium (i.e., assets are fairly priced), which of the scenarios would be possible?

A.

Portfolio	***Expected Return***	***Beta***
A	20%	1.4
B	25	1.2

B.

Portfolio	***Expected Return***	***Standard Deviation***
Risk-free	10%	0
Market Portfolio	18	24
C	18	15

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: C

Choice (a) is not possible. Portfolio A has a higher beta than Portfolio B, but the expected return for Portfolio A is lower than the expected return for Portfolio B. Thus, these two portfolios cannot exist in equilibrium.

Choice (b) is not possible. The reward-to-total risk ratio for Portfolio C is better than that of the market. This scenario is impossible according to the CAPM because the CAPM predicts that the market is the most efficient portfolio. Using the numbers supplied:

Sc = (0.18-0.10)/0.15 = 0.533 Sm = (0.18-0.10)/0.24 = 0.333

Portfolio C provides a better risk-reward tradeoff than the market portfolio (above 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.

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

I. A stock's intrinsic value does not change with changes in expected inflation nor with changes in market risk aversion.
II. Three aspects of cash flows that affect valuations of any stream of expected cashflows, are their amount, timing and riskiness.
III. Treasury bill transactions are considered Capital Market transactions.
IV. The goal of financial management is to maximize profit margins.

A. I only.
B. I and IV only.
C. II only.
D. III and IV only.
E. All of the statements are incorrect.

Answer: C

19. Find the geometric average return for Stock G.

Year	End of Year Price	Dividends Received
0	$2.50	
1	2.25	$0.05
2	2.37	0.04
3	2.60	0.04
4	2.54	0.04

A. 1.00%
B. 1.15%
C. 1.67%
D. 2.00%
E. 2.16%

Answer: (E)

R1 = (2.25 – 2.50 + 0.05)/2.5 = -0.0800
R2 = (2.37 – 2.25 + 0.04)/2.25 = 0.0711
R3 = (2.60 – 2.37 + 0.04)/2.37 = 0.1139
R4 = (2.54 – 2.60 + 0.04)/2.60 = -0.00769

→ $\mathbf{[(1-0.08)*(1+0.0711)*(1+0.1139)*(1-0.00769)]^{1/4} - 1 = 0.0216}$

20. What is the present value of an investment that pays $10,000 once every year forever, if the first payment occurs one year from today and the nominal discount rate is 8%, compounded monthly?

A. $80,640
B. $98,345
C. $105,608
D. $120,482
E. $128,588

Answer: (D)

Effective 1-year rate = [1 + (0.08/12)]^12 – 1 = 8.299951%
PV = $10,000 / 0.08299951 = $120,482.64

21. What is the present value of an investment that pays $10,000 once every three years forever, if the first payment occurs one year from today and the discount rate is 8% compounded monthly?

A. $43,402
B. $37,004
C. $27,025
D. $52,806
E. $61,869

Answer: (A)

Effective 3-year rate = [1 + (0.08/12)]^36 – 1 = 27.023705%
OR Effective 3-year rate = [1 + 0.08299951]^3 – 1 = 27.023705%

PV = $10,000 / 0.27023705 = $37,004.54819
This is the value of the perpetuity one period (three years) before the first payment, which is two years ago. We need to compound this value for two years to find the value today. The value of the cash flows today is = $37,004.54819*(1 + 0.08/12)^24 = $43,402.19
OR $37,004.54819*(1 + 0.08299951)^2= $43,402.19

22. Asset A has a beta of 1.2 while Assets B and C both have the same beta, X. You invest 20% of your portfolio in Asset A, 40% in Asset B and 40% in Asset C. Your portfolio beta is 0.88. What is the value of X, i.e. the beta of Assets B and C?

A. 0.8
B. 0.9
C. 1.0
D. 1.1
E. Cannot be determined.

Answer: A

$w_A(1.2) + w_B(X) + w_C(X) = 0.88$
0.2*(1.2) + 0.8*(X) = 0.88

→ **X = (0.88 – 0.2*1.2)/0.8 = 0.8**

23. Which of the following statements below is/are most **CORRECT**?

A. The risk-free rate of return includes compensation for expected inflation.
B. The real rate of return is higher than the nominal rate of return given a positive rate of inflation.
C. Any required return greater than the risk-free rate results only when beta is negative.
D. The term structure of interest rates shows how rates change with different default risk levels when we hold maturity constant.
E. Statements A and C are correct.

Answer: A

24. Which of the following statements below regarding **CFFA** is/are most **CORRECT**?

A. CFFA conveys what cash the firm's operations were able to generate and return to the firm's investors, after taking into account all net investment needed in both short term operating assets as well as fixed assets.
B. When a firm has negative CFFA for any given year, this indicates that the firm is in financial distress.
C. CFFA does not reflect any costs or benefits of taking on debt.
D. Statements A and C are correct.
E. Statements A, B and C are correct.

Answer: D

25. The beta of Stock J is 1.35. The risk-free rate of return is 1.5% and the market risk premium is 12%. Stock J is currently priced in the market based on the following scenario analysis - there will only be two states of the world: either the stock returns 50% if the economy booms, or the return will be -15% if the economy stagnates. There is an equal chance that the economy booms or stagnates. Which one of the following statements is true given all of the information above?

A. According to CAPM, the stock should have an expected return of 15.7 percent.
B. The expected stock return indicates the stock is currently overpriced according to CAPM.
C. The stock has more systematic risk than the overall market.
D. Both statements B and C are correct.
E. Both statements A and C are correct.

Answer: D

E(r) = 0.5*50% - 0.5*15% = 17.5%;
Required r = 1.5% + 1.35*(12%) = 17.7%.
Since Required r > Expected r, it means Stock J will plot below the SML; Stock J is overpriced.

26. Assets A and B are perfectly positively correlated. Asset A has standard deviation of returns of 36% and Asset B has a standard deviation of returns of 26%. You invest in a portfolio comprising 40% of Asset A and 60% of Asset B. What is the standard deviation of returns for the portfolio?

    A. 26%
    B. 27%
    C. 28%
    D. 29%
    E. 30%

Answer: E

Since Asset A and Asset B are perfectly positively correlated, the resultant portfolio standard deviation is the weighted average standard deviation.
$\sigma_P = w_A\sigma_A + w_B\sigma_B = 0.4*0.36 + 0.6*0.26 = 0.3$

27. Sungjune's Toy Store had a net income for the most recent year of $225,000 and a corporate tax rate of 40%. The firm recorded $45,000 in interest expense and 120,000 in depreciation. What was Sungjune's Toy Store's cash coverage ratio?

    A. 6
    B. 8
    C. 10
    D. 12
    E. 14

Answer: D

EBT = $225,000/(1 – 0.4) = $375,000
CCR = (EBIT + Depreciation)/ Interest = ($375,000 + $45,000 + 120,000) / 45,000 = 12

28. Which of the following statements below is/are most **CORRECT**?

    A. If 2 different portfolios both plot on the SML, then they can not be fairly priced.
    B. The slope of the line we get from plotting a stock's excess return against the market portfolio's excess return is always the market risk premium.
    C. An asset's standard deviation of returns reflects its total risk.
    D. An asset's beta measure reflects its market risk.
    E. Statements C and D are both correct.

Answer: E

29. You have just arranged for a $1.25 million amortized loan to finance the purchase of a property. The APR is 1.8% with monthly compounding, and it calls for equal monthly instalments over 30 years. However, the loan has a potential ten-year balloon payment, meaning that the loan can be paid off then (at the end of 10 years). How large will the balloon payment be at the end of 10 years?

A. $1,234,730.19
B. $1,065,348.79
C. $905,647.03
D. $763,185.23
E. $528,261.45

Answer: C

PVA = $1,250,000 = C({1 – [1 / (1 + 0.018/12)]^{360}} / (0.018/12))
C = $4,496.23

OR Interest = 1.8%/12 0.15%, PV = 1.25 million, n = 30*12 = 360, cpt PMT = 4,496.23
Now, at time = 10 years, we need to find the PV of the payments which have not been made.
The balloon payment will be:

PVA = $4,496.23({1 – [1 / (1 + 0.018/12)]$^{12(20)}$} / (0.018/12))
PVA = $905,647.03

OR PMT=4,496.23, n = 20*12 = 240, I = 0.15% cpt PV = 905,648.42 (rounding difference not affecting answer choice)

30. You receive a credit card application from Wenlan Bank offering an introductory nominal rate of 2.4 percent per year, compounded monthly for the first five months, increasing thereafter to a nominal rate of 24 percent, compounded monthly. Assuming you transfer the current debt balance of $15,000 from your existing credit card and make no subsequent principal or interest payments, how much interest would you owe <u>at the end of the first year</u>?

A. $4,023.63
B. $2,403.28
C. $1,500.00
D. $796.24
E. $150.60

Answer: B

After the first five months, the balance will be:
FV = $15,000 [1 + (0.024/12)]^5 = $15,150.60
The FV in another seven months will be:
FV = $15,150.60[1 + (0.24/12)]^7 = $17,403.28
The interest accrued is:
Interest = $17,403.28 – 15,000.00 = $2,403.28