FIN2704/X/FIN2004/X

MID-TERM

Semester I, 2019/2020

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.

Millie's, Inc.
2019 and 2018 Balance Sheets

	2019	*2018*		*2019*	*2018*
Cash	$160,000	$130,000	Accounts Payable	$280,000	$240,000
Accounts Receivable	250,000	270,000	Notes Payable	60,000	90,000
Inventory	400,000	350,000	Total CL	$340,000	$330,000
Total CA	$810,000	$750,000			
			Long-Term Debt	284,000	270,000
Net Fixed Assets	650,000	600,000	Common Stock	220,000	200,000
			Retained Earnings	616,000	550,000
Total Assets	$1,460,000	$1,350,000	Total Liab & Equity	$1,460,000	$1,350,000

Millie's, Inc.
2019 Income Statement

Sales	$	1,600,000
Cost of Goods Sold		1,280,000
Depreciation Expense		60,000
Earnings before Interest and Tax		260,000
Interest Expense		40,000
Taxable Income		220,000
Less: Taxes (40%)		88,000
Net Income		$132,000

1. What is the amount of "Interest Tax Shield" for 2019 (please refer to interest tax shield as defined and applied in your class notes)?

   A. $12,000
   B. $8,000
   C. $16,000
   D. $20,000
   E. None of the above choices are correct

Answer: C
Interest tax Shield 2019 = $40,000*0.4 = $16,000

2. What is amount of Cashflow to Creditors for 2019 (please refer to Cashflow to Creditors as defined and applied in your class notes)?

   A. $40,000
   B. $24,000
   C. $50,000
   D. $56,000
   E. None of the above choices are correct

Answer: D

Cashflow to Creditors = Interest Expense – Net New Borrowing
= 40,000 – [(60,000+284,000) – (90,000+270,000)] = $56,000

3. What is amount of Cashflow to Stockholders for 2019 (please refer to Cashflow to Stockholders as defined and applied in your class notes)?

   A. $66,000
   B. $60,000
   C. $46,000
   D. -$38,000
   E. None of the above choices are correct

Answer: C

Dividends = $132,000 – (616,000 – 550,000) = $66,000
Cashflow to Stockholders = Dividends – Net New Equity = $66,000 – ($220,000 - $200,000) = $46,000

4. What is the amount of "Change in NOWC" for 2019 (please refer to NOWC as defined and applied in your class notes)?

   A. $120,000
   B. $60,000
   C. $20,000
   D. $30,000
   E. None of the above choices are correct

Answer: C

→ Change in NOWC = ($160,000 + $250,000 + $400,000 - $280,000) – ($750,000 - $240,000)
= $20,000

5. What is the amount of Cash Flow From Assets (CFFA) for 2019 (please refer to CFFA as defined and applied in your class notes)?

   A. $86,000
   B. $126,000
   C. $146,000
   D. $186,000
   E. None of the above choices are correct

Answer: A

Operating Cash Flow 2018 = $260,000*(1-40%) + $60,000 = $216,000

Cash Flow from Assets = OCF – NCS – Change in NOWC

= $216,000 – (650,000 – 600,000 + 60,000) – $20,000 = $86,000

6. MIC Corp's CFO is having a discussion with the Treasurer on whether to raise capital by issuing 10-year corporate bonds or issuing equity. This is an example of a:

   A. Capital budgeting decision
   B. Investment decision
   C. Capital structure decision
   D. Working capital management decision
   E. Corporate governance decision

Answer: C

7. You believe in CAPM and the SML and CML. You have invested $80,000 of your own funds in the market portfolio. You would like to increase your portfolio beta to 1.4, by borrowing at the risk-free rate and then investing those borrowed funds in the market portfolio. How much will you need to borrow to achieve your portfolio objective?

   A. $22,000
   B. $30,000
   C. $32,000
   D. $40,000
   E. $42,000

Answer: C

Beta of portfolio = 1.4
Own funds = $80,000
Borrowed funds = $X

$X +$80,000= 1.4*$80,000 = $112,000
X = 32,000

8. Your current bank offers interest on deposits at 5% compounded annually. Matop Bank would like to lure you to their bank and will offer you daily compounding. What stated APR must Matop offer for you to be indifferent between the two banks' deposit rates?

   A. 4.00%
   B. 4.33%
   C. 4.88%
   D. 5.11%
   E. None of the above

Answer: C

(1+APR/m)^m = 1+ EAR
(1 + X/365)^365 = 1.05
1 + X/365 = (1.05)^(1/365)
X = 0.04879

9. Wheat & Co. has Current Liabilities of $240,000, Sales of $1.2 million, Profit Margin of 10 percent, ROE of 15 percent, Long-Term Debt ratio of 0.6 and a Current Ratio of 1.4. What is Wheat & Co.'s Fixed Asset Turnover ratio?

   A. 1.24
   B. 0.95
   C. 0.77
   D. 0.63
   E. 0.49

Answer: D

Current Assets = $240,000*1.4 = $336,000; Net Income = 10%*$1.2m = $120,000; Total Equity = $120,000/15% = $800,000; LTD = 0.6*$800,000/(1-0.6) = $1,200,000 → Total Liabs = $1,440,000;
NFA = $1440,000+$800,000-$240,000 = $1,904,000. → FATO = $1.2m/$1,904,000 = 0.63

10. You have just taken out a $3 million amortized loan. The APR is 6%, with annual compounding and it calls for equal yearly instalments to be paid each year over a total of 5 years. What is the annual installment you will pay?

    A. $712,189.20
    B. $802,935.35
    C. $750,500.90
    D. $778,964.88
    E. $730,000.00

Answer: A

N = 5; I = 6%; PV = $3,000,000; cpt PMT
PMT = $712,189.20

Year	Beginning Principal	Instalment	Interest	Principal Paid	Ending Principal
1	$3,000,000	$712,189.20	$180,000	$532,189.20	$2,467,810.80
2	$2,467,810.80	$712,189.20	$148,068.65	$564,120.55	$1,903,690.25
3	$1,903,690.25	$712,189.20	$114,221.41	$597,967.79	$1,305,722.46
4	$1,305,722.46	$712,189.20	$78,343.35	$633,845.85	$671,876.60
5	$671,876.60	$712,189.20	$40,312.60	$671,876.60	$0

$560,946

11. For the loan described in the question above ($3 million amortized loan, with an APR of 6%, annual compounding and equal yearly instalments over 5 years), how much total interest would you be paying on the loan over its five year life?

A. $810,270
B. $707,354
C. $680,628
D. $560,946
E. None of the above

Answer: D

Use the following statements for Qns 12 – 13.

State of Economy	Probability	Asset P expected returns	Asset Q expected returns
Recession	1/3	–20%	38%
Normal	1/3	10	2%
Boom	1/3	20%	–10%

You would like to form a portfolio comprising 50% of Asset P and 50% of Asset Q.
The standard deviation of Asset P's returns is 17.0% and standard deviation of Asset Q's returns is 20.4%.
Asset P and Asset Q are perfectly negatively correlated.

12. What is the expected return of the portfolio?

A. 3.3%
B. 6.7%
C. 10.0%
D. 13.3%
E. None of the above

Answer: B
$E(r_P) = (-20\% + 10\% + 20\%)/3 = 3.33\%$; $E(r_Q) = (38\% + 2\% - 10\%)/3 = 10\%$
→ Return of portfolio = 0.5*3.33% + 0.5*10% = 6.67%

13. What is the covariance of returns of Asset P with Asset Q?

A. 0%
B. -0.55%
C. -1.70%
D. -3.47%
E. -18.6%.

Answer: D
Covariance = (-1)*20.4%*17.0% = -3.468%

14. You are considering two projects with the following cash flows:

	Project X	**Project Y**
Year 1	$2,000	$10,000
Year 2	5,000	7,000
Year 3	7,000	5,000
Year 4	10,000	2,000

Which of the following statement(s) is/are true regarding these two projects?

I. Both projects have the same present value, given a zero rate of return.
II. Both projects have the same future value, given a zero rate of return.
III. Project X has a higher present value than Project Y, given a positive discount rate.
IV. Project Y has a higher present value than Project X, given a positive discount rate.

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

Answer: E

15. Shaq Inc. has a Return on Equity of 20%, a Return on Assets of 10% and has $110 million in total assets. How much debt does Shaq Inc. hold?

A. $45 million
B. $50 million
C. $55 million
D. $60 million
E. $75 million

Answer: C

ROE = TATO * PM * EM
ROE = ROA * EM
EM = 20%/(10%) = 2 = 110/TE
EM = TA/TE = 2 = 110/TE

TE = $55M

TD = Total Assets – Total Equity = 110M – 55M = 55M

16. The below chart provides information on Lallana Inc.'s stock. Find the total return as well as the dividend yield.

Year	End of Year Price	Dividends Received
0	$50	
1	$47.50	$2.00

A. Total return = + 1.0%, Dividend Yield = +4.0%
B. Total return = + 1.0%, Dividend Yield = +4.2%
C. Total return = -1.0%, Dividend Yield = +4.0%
D. Total return = -1.0%, Dividend Yield = +4.2%
E. Total return = + 5.0%, Dividend Yield = +4.0%

Answer: C

Total Return = (47.5 – 50 +2)/ 50 = -1.0%
Dividend Yield = 2/50 = 4%

17. The market portfolio is correctly priced as per the CAPM, offering a 15% expected return. The risk-free rate is 5%. You are thinking of buying (i) Mane Inc. which has a Beta of 1.5 and an expected return of 20% and (ii) Sadio Inc. which has a Beta of 1.7 and an expected return of 23%. If you only wish to buy stock(s) that are either fairly priced **and/or** underpriced, which stock(s) would you buy?

A. Mane Inc. only
B. Sadio Inc. only
C. Both Mane Inc. and Sadio Inc.
D. Neither Mane Inc nor Sadio Inc.
E. Mane Inc. but not Sadio Inc.

Answer: C

Rm – rf = .15 - .05, thus risk/ return ratio is 10%
Mane return – rf/ Mane Beta = (0.20 – 0.05)/1.5 = 10%

Sadio return – rf/ Sadio Beta = (0.23 – 0.05) / 1.7 = 10.59%

Sadio gives more return per unit of market risk so it is underpriced.

Thus buy both.

18. Which one of the following is/are the **BEST** examples of unsystematic risk?

I. A flood damages a firm's inventory in its warehouse.
II. The Central Bank increases interest rates.
III. Employment taxes are increased at a national level.
IV. Protestors cause a shutdown of the financial market for 2 weeks.

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

Answer: A

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

I. Risk aversion among investors is represented by the slope of the SML line.
II. The portion of investors' stock return compensating them for expected inflation is best captured by the risk-free asset.
III. Combining 50 assets in the oil and gas industry into a portfolio, will not result in diversification benefits.
IV. According to the Capital Asset Pricing Model's SML, all assets should have the same reward to risk ratio.

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

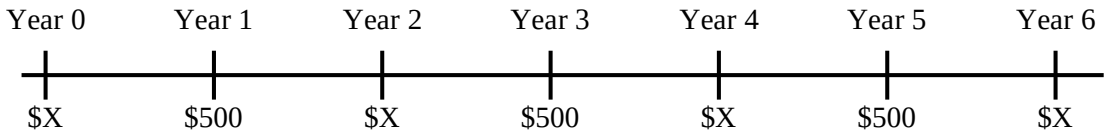
Answer: E

20. You are comparing the performance of two companies operating in the same industry and geography, but which are different in size and capital structure. Of the choices below, which is the best ratio to review their performance?

A. Return on Equity
B. Return on Assets
C. Profit Margin
D. Basic Earning Power
E. Interval Measure

Answer: D

21. The Present Value of the cashflow stream below is $5,000. Assuming an annual interest rate of 10%, find $X.



A. $1,420.83
B. $1,319.16
C. $1,255.51
D. $1,112.94
E. $1,071.45

Answer: C

The PV of the three $500 cashflows is = 500/(1.1) + 500/$(1.1)^3$ + 500/$(1.1)^5$ = $1,140.66
Therefore, the PV of the cashflow stream of $X = $5,000 - $1,140.66 = $3,859.34
The rate for 2-year period = (1+10%)2 – 1 = 21%
To find X: N = 4; I = 21%; PV = 3859.34, cpt PMT (bgn) = $1,255.51

22. The market rate of return is 10 percent and the risk-free rate of return is 2 percent. Andy Stock has 25 percent less systematic risk than the market and is now priced in the market to give an expected return of 8 percent. Assuming that CAPM is correct, then Andy stock:

A. is underpriced.
B. is overpriced.
C. is correctly priced.
D. will plot on the security market line.
E. Both C and D.

Answer: E
Required return of Stock T = 2% + 0.75*(10% - 2%) = 8%

23. Assuming CAPM holds, that there is market equilibrium and investors are rational, which of the scenarios is/are possible?

A.

Portfolio	Expected Return	Beta
A	30%	1.3
B	25	1.8

B.

Portfolio	Expected Return	Standard Deviation
Risk-free	2%	0
Market	10	20

C	8	15

C.

Portfolio	Expected Return	Standard Deviation
Risk-free	4%	0
Market	2	20
D	3	10

D. All of the above scenarios are possible.

E. None of the above scenarios are possible.

Answer: B
Choice (a) is not possible. Portfolio A has a lower beta than Portfolio B yet the expected return for Portfolio A is higher than the expected return for Portfolio B. Based on CAPM, excess return should be 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:

$$S_c = \frac{0.08 - 0.02}{0.15} = 0.4; S_m = \frac{0.10 - 0.02}{0.20} = 0.4$$

Portfolio C is on the CML.

Choice (c) is not possible. The reward-to-total risk ratio for Portfolio D is the same as that of the market. Using the numbers supplied:

$$S_c = \frac{0.03 - 0.04}{0.1} = -0.1; S_m = \frac{0.02 - 0.04}{0.20} = -0.1$$

However, since the risk-free rate is above that of the market, rational investors will simply invest in the risk-free asset only. Hence, Portfolio D should not exist.

24. Adrian is 20 years old today and he plans to save $30,000 every year, at the beginning of each year, beginning today, for the next 30 years toward retirement. He expects to live for 40 years after retirement. Adrian would like to withdraw $6,000 at the beginning of each month for the first 20 years of his retirement. Assuming an APR of 3% that compounds monthly, how much can Adrian continue to withdraw at the beginning of each month for the last 20 years of his retirement?

A. $3,989
B. $4,316
C. $4,872
D. $5,564
E. $6,180

Answer: A

0 30 50 70

Find PV_{30} of first 20 years of withdrawals using BEG mode:
N = 240; I=3/12; PMT = $6,000; cpt PV = $1,084,570.15

Find the EAR of account:
$EAR = (1 + 3\%/12)^{12} - 1 = 3.0416\%$

Find Total Savings, using BEG mode:
N = 30; I=3.0416; PMT = $30,000; cpt FV_{30} = $1,480,625.36

PV_{30} of final 20 years of withdrawals = $1,480,625.36 – $1,084,570.15 = $396,055.21

Value of this amount at end of year 50:
N = 240; I=3/12; PV_{30} = $396,055.21; cpt FV_{50} = $721,119.50

Amount that Adrian can withdraw each month, using BEG mode:
N = 240; I=3/12; PV = $721,119.50; cpt PMT = $3,989.34

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

I. If assets are risk-free, then the timing of the stream of risk-free cash flows is not important to investors.
II. An asset which is uncorrelated with the market portfolio, will have a beta that is lower than the market portfolio but higher than the risk-free asset.
III. Beta measures a stock's market risk.
IV. Standard deviation is a measure of risk that includes both diversifiable and non-diversifiable risk.

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

Answer: C

26. Which stream of cash flows is worth more today, given a 10% EAR applicable to each investment?

- ***Investment A***: A cash flow of $11.00 every year forever, with the first cash flow received next year.
- ***Investment B***: A cash flow of $10.00 every year forever, with the first cash flow received today.
- ***Investment C***: A cash flow of $5.40 every 6 months forever, with the first cash flow received in 6 months.

A. Investment A.
B. Investment B.
C. Investment C.
D. Both Investments A and B are equal in value, and both preferable to C.
E. Investments A, B and C are all equal in value

Answer: C

Inv A = $11/.1 = 110
Inv B = $10/.1 + 10 = 110
Inv C: (1 + APR/2)^2 = 1 + .10; APR/2 = 0.048808, = 5.5/0.048808 = $110.637

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

A. Any return greater than the risk-free rate represents the market risk premium.
B. If the inflation rate is 2%, a deposit product rewarding savers 1% has a negative real rate of return.
C. As per the SML, if the risk-free rate increases, then the measure of market risk aversion decreases.
D. Statements A and C are correct.
E. Statements A, B and C are correct.

Answer: B

28. Zipcord, Inc. has Total Assets of $2.5 million, Accounts Receivable of $400,000, EBIT of $500,000, Profit Margin of 8% and Return on Assets of 12%. On average, the industry takes 35 days to collect on sales. Assume that there are 365 days in a year. Which of the following statements below is **CORRECT**?

A. Zipcord, Inc. takes more time to collect on sales as compared to the industry.
B. Zipcord, Inc. takes less time to collect on sales as compared to the industry.
C. Zipcord, Inc. has a Basic Earning Power (BEP) of 20%.
D. Statements A and C are both correct.
E. Statements B and C are both correct.

Answer: D

TATO = ROA/PM → TATO = 12%/8% = 1.5
Sales = 1.5*$2.5 million = $3.75 million
DSO = 400,000/(3,750,000/365) = 38.93 days
BEP = 500,000/2,500,000 = 20%

29. Nair contributes $5,000 at the beginning of each month into an investment product. The investment product offers a nominal APR of 12%, with monthly compounding. Irvin prefers to invest one lump sum amount today into the same investment product, rather than make monthly contributions. Both Nair and Irvin want the same amount at the end of 10 years. How much must Irvin invest today?

A. $246,190.32
B. $289,312.59
C. $351,987.64
D. $392,431.25
E. $458,223.71

Answer: C

Find FV_{10} of Nair's contributions using BEG mode:
N = 120; I = 12/12; PMT = $5,000; cpt FV = $1,161,695.38

Find Irvin's lump-sum investment amount:
N = 120; I = 12/12; FV = $1,161,695.38; cpt PV = $351,987.64

30. You are considering purchasing a new designer kitchen for $75,000. The sales manager offers two payment schemes. Plan A is a semi-annual instalment plan of $10,000 every six months for four years. Plan B is a monthly instalment plan of $3,200 each month for two years. What is the difference in effective annual rates of the two payment schemes?

A. Plan A's EAR is lower than Plan B's EAR by 0.72%.
B. Plan A's EAR is lower than Plan B's EAR by 1.45%.
C. Plan B's EAR is lower than Plan A's EAR by 0.63%.
D. Plan B's EAR is lower than Plan A's EAR by 1.84%.
E. Both plans have the same EAR.

Answer: C

PV = $75,000; PMT = -$10,000; N = 8; cpt I/Y = 1.457%
→ EAR of Plan A = (1 + 1.457%)^2 – 1 = 2.94%

PV = $75,000; PMT = -$3,200; N = 24; cpt I/Y = 0.1906%
→ EAR of Plan B = (1 + 0.1906%)^12 – 1 = 2.31%

Difference is 2.94% – 2.31% = 0.63% (Plan A is higher than Plan B)