Finance and Financial Reporting

Master in Actuarial Science

Exam EN

03/01/2018

3 HOURS

No.

Name: ____ __________

PLEASE READ THE FOLLOWING INFORMATION BEFORE SOLVING THE EXAM:

1) You are allowed to keep your pens, pencils and a calculator with you as well as the current edition of the Formulae and Tables. The calculator cannot have neither communications nor any kind of texting features.
2) The structure of the exam is the following:
    - Questions 1 to 10 are multiple choice;
    - Questions 11 to 20 require explaining all the steps in your solutions.
3) You must not start writing your answers in the booklet until instructed to do so by the supervisor.
4) Mark allocations are shown in brackets.
5) Attempt all 20 questions. Answer questions 1-10 in the grid to answer multiple choice questions. Answer questions 11-20 in the space given below the question. If you eventually require more space, please, use the additional sheet at the end of this booklet.
6) Candidates should show calculations where this is appropriate.
7) **You are not allowed to un-staple the exam. However, you can detach the scrap paper.**

GOOD LUCK!

GRID TO ANSWER MULTIPLE CHOICE QUESTIONS

Question #	A	B	C	D
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

1) [2 points] Which of the following is not a type of firm?

a) Sole Proprietorship
b) Partnership
c) Limited partnership
d) Private unlimited partnership

2) [2 points] Which of the following statements is correct concerning the decisions made by a financial manager?

a) The financial manager makes investment decisions
b) The financial manager makes financial decisions
c) The financial manager makes decisions about cash flows
d) All of the above

3) [2 points] Why is value creation the financial objective of a corporation?

a) Because it focuses on sustainability, long run and cash flows
b) Because it focuses on sustainability and long run
c) Because it focuses on cash flows
d) Because it focuses on sustainability, long run, cash flows and historical profits

4) [2 points] Star Ways has just issued a 5-year bond with a face value of 200 million euros. The principal will be paid at maturity. The coupon rate is 3% as well as the yield to maturity. The coupon is paid annually. The corporate tax rate will be 25% during this period. How much is the present value of the interest tax shield of this bond?

a) 1,500
b) 50,000
c) 6,870
d) 7,500

[Solution]

$$ITS = D \times r_d \times \tau_c = 200{,}000 \times 0.03 \times 0.25 = 1{,}500$$

$$PV(ITS) = ITS \frac{1-(1+r)^{-T}}{r} = 1{,}500 \frac{1-(1.03)^{-5}}{0.03} = 6{,}870$$

5) [2 points] Which of the following is not an accounting principle?

a) No offsetting
b) Materiality
c) Consistency
d) Form over substance

6) [2 points] The Trade-Off Theory states that

a) capital structure is based on trade-off between tax savings and distress costs of debt
b) capital structure is based on trade-off between tax savings and distress benefits of debt
c) capital structure is based on trade-off between equity and debt

d) capital structure is based on trade-off between higher equity cost of capital and higher debt cost of capital

Use the following data for the next two questions:

Income Statement (€m)		Balance Sheet (€m)			
Revenue	54 000	Non-Current Assets	43 000	Equity	73 000
Cost of Sales	34 800	Inventory	60 000	Non-Current Liabilities	38 000
EBIT	19 200	Accounts Receivable	13 000	Bank Loan	5 000
Taxes	5 376	Cash	15 000	Accounts Payable	15 000
Profit for the year	13 824	Total	131 000		131 000

7) [2 points] The EBIT Margin is closest to:

a) 0.1466
b) 0.3556
c) 0.2630
d) 0.2560

[Solution]

$$EBIT\ Margin = \frac{19.200}{54.000} = 0.3556$$

8) [2 points] The Accounts Receivable Days is closest to:

a) 0.24
b) 147.95
c) 87.87
d) 157.33

[Solution]

$$\text{Accounts Receivable Days} = \frac{\text{Accounts Receivable}}{\text{Average Daily Sales}} = \frac{13,000}{54.000/365} = 87.87$$

9) [2 points] Concerning the IRR, which of the following statements is CORRECT?

a) The IRR investment rule states you should take any investment opportunity where the IRR is lower than the opportunity cost of capital.
b) The IRR investment rule states that you should take any investment opportunity where the IRR exceeds the opportunity cost of capital.
c) Since the IRR rule is based upon the rate at which the NPV equals zero, the IRR decision rule will always coincide with the NPV decision as long as the cash flows go from outflows to inflows, identify the correct investment decisions.
d) There are not situations in which multiple IRRs exist.

10) [2 points] Suppose Star Way's stock has a beta of 0.87. If the risk-free rate is 1% and the expected market risk premium is 6%, what is Star Ways's equity cost of capital?

a) 6.22%
b) 5.35%

c) 5.22%
d) 7.00%

[Solution]

$r_E = 1\% + 0.87 \times 8\% = 6.22\%$ [5 points]

11) [5 points] Managers are agents of the shareholders, who are expected to work in the shareholders best interests. However, this is not always the case. Give some examples of institutional arrangements that may help managers to focus their attention in value creation.

[Solution]

- the board of directors, elected by shareholders, which scrutinizes managers' actions
- competition among managers
- the threat of takeover that brings a new management team
- incentive schemes that are closely tied to the value of the firm like stock options

12) [5 points] What is the relationship between interest rates and bond prices?

[Solution]

Interest rates and bond prices are inversely related. Higher interest rates cause bond prices to fall and vice versa. For a given change in interest rates, prices of long-term bonds fluctuate more than those of short-term bonds. Similarly, for a given change in interest rates, low-coupon bond prices fluctuate more than those of high-coupon bonds.

13) [5 points] What information does a dividend change convey to investors?

[Solution]

A dividend change usually indicates something about the future cash flows of the firm, namely the management team expectations about future cash flows. Thus, an increase in the dividend indicates higher expected cash flows. On the contrary, a decrease in the dividend indicates a decrease in future cash flows. Consequently, increasing dividends may lead to higher stock prices and decreasing dividends may have the opposite effect.

14) [5 points] Briefly explain how APV can be used for valuing a project

[Solution]

The value of a project can be estimated by calculating the present value of free cash flows (FCF) generated by the project using the project's unlevered opportunity cost of capital as the discount rate for the life of the firm. This gives the base-case NPV. Then, it will be adjusted to eventual tax shields that may benefit the project if it is totaly or partially financed by debt. In addition, any cost from raising new equity or debt is also considered now.

15) [5 points] Briefly explain the relationship between risk and option values.

[Solution]

Options on volatile (risky) assets are more valuable than options on safer assets. This contrasts with most financial settings in which risk is a bad thing and investors have to be paid to bear it. The value of an option increases with the volatility of the underlying stock price.

16) [5 points] What is the main objective of a collection policy?

[Solution]

The main objective of collection policy is to collect on overdue accounts using least-offensive methods. But it is not always possible to do so. Most companies use collection agencies to collect on overdue account.

17) [5 points] The fraud triangle identifies incentives, opportunities, and rationalizations as the three elements associated with most frauds. Briefly, describe how each of these elements is necessary for fraud to occur.

[Solution]

Incentives relate to the rationale for the fraud, e.g., need for money, desire to enhance stock price. Opportunities relate to the ability of the fraudster to accomplish the fraud, e.g., through weak internal controls. Rationalization is the psychological process of justifying the fraud.

18) [5 points] Discuss the differences between an operating lease and a financial lease.

[Solution]

Generally, operating leases are short-term leases. Operating leases are cancelable during the contract period. Generally, financial leases are long-term leases covering the economic life of the asset and are non-cancelable. Financial leases are a source of financing

19) [20 points] Star Ways is considering a new 3-year project – Project Warp Drive – to develop space ship engines able to travel at several times the speed of light. The revenues are as follows:

Year	**1**	**2**	**3**
Revenues	1,000	1,500	2,000

In this industry, the costs of sales (excluding depreciation) are approximately 60% of the revenues. Capital expenditures today are 1,200, in a new lab. This lab will be settled in a facility currently rented at 10 per year. The lab equipment has a time life of 3 years (straight-line depreciation, fully depreciated in 3 years). The net working capital is expected to be close to 5% of the next year annual revenues.

The project is going to keep the current firms' capital structure. The risk of this project is similar to the firm's average risk. However, due to the strategic relevancy of this project to the global economy, the corporate tax rate is 10%. We have also collected the following financial information about the company:

Star Ways Market Value Balance Sheet and Cost of Capital					
Assets		**Liabilities**			
Cash	1000	Debt	2,000	Cost of Debt	3%
Other Assets	10,000	Equity	9,000	Beta Equity	2,5

The risk-free interest rate is 1% and the expected market return is 8%.

a) [10 points] Estimate the Free Cash Flows of this project.

[Solution]

t	**0**	**1**	**2**	**3**
Revenues	0	1000	1500	2000
Costs Excluding Depreciation	0	600	900	1200
Cost of Opportunity	0	10	10	10
Depreciation	0	400	400	400
EBIT	0	-10	190	390
EBIT(1-Tc)	0	-9	171	351
Depreciation	0	400	400	400
CapEx	1200	0	0	0
NWC	50	75	100	0
Change NWC	50	25	25	-100
FCF	**-1250**	**366**	**546**	**851**

b) [10 points] Estimate the after-tax cost of capital for this project.

[Solution]

$$R_e = 0.01 + 2.5(0.08 - 0.01) = 0.185$$
$$E = 9{,}000$$
$$D\,(net\ debt) = 2{,}000 - 1{,}000 = 1{,}000$$
$$E + D = 10{,}000$$
$$WACC = 0.185\frac{9{,}000}{10{,}000} + 0.03(1 - 0.1)\frac{1{,}000}{10{,}000} = 0.1692$$

20) [20 points] Star Ways Academy, a division of Star Ways, is preparing the year-end financial statements. For this end, your help is required. So, use the following data to prepare:

a) [10 points] Statement of Profit or Loss (income statement)

b) [10 points] Statement of Financial Position (balance sheet)

Year-end Trial Balance

	Debit	Credit
Administrative staff salaries	4.824	
Cash	34.394	
Treasury-bills	30.600	
Faculty wages	19.566	
Dividend paid	27.000	
Energy Expenses	6.516	
Loan Interest	7.200	
Long term loan		81.000
Other operational expenses	192.868	
Opening inventory		
Plant and Equipment - cost	162.738	
Plant and Equipment - depreciation		87.354
Directors' salaries	7.560	
Property - Cost	176.400	
Property - depreciation		26.208
Retained Earnings		38.124
Revenue		386.040
Sales staff commission	9.360	
Sales staff salaries	21.330	
Share capital		135.000
Accounts Payable		28.860
Accounts Receivable	82.230	
	782.586	**782.586**

Values in €000

Additional information (€000)

- The company spent in research €1500
- Depreciation for the current year has still to be recorded on the following basis:
    - Property: 2% straight line
    - Plant and equipment: 25% straight line
- The corporate tax rate is 20%

[Solution]

Star Ways Academy
Statement of Profit of Loss

Revenue	**386.040**
Personal Costs	62.640
Operating costs	200.884
Depreciation	44.213
Operating Profit/EBIT	78.304
Finance Charge	7.200
Profit before tax	71.104
Tax expense	14.221
Profit for the year	56.883

Star Ways Academy
Statement of Financial Position

Non-current Assets	**181.364**
Current Assets	
Accounts Receivable	82.230
Cash and Equivalents	64.994
	147.224
Total Assets	328.588
Equity	
Share capital	135.000
Retained Earnings	68.007
	203.007
Non-current liabilities	
Loan	81.000
Current Liabilities	
Accounts Payable	28.860
Tax	14.221
Accruals	1.500
	44.581
Total Liabilities	125.581
Total Equity+Liabilities	328.588