Finance and Financial Reporting

Master in Actuarial Science

Exam EN

23/01/2019

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] The Principal-Agent Problem arises:

a) because managers have little incentive to work in the interest of shareholders when this means working against their own self-interest
b) because of the separation of ownership and control in a corporation
c) Both A and B
d) None of the above

2) [2 points] What is the role of an auditor in financial statement analysis??

a) To ensure that the annual financial statements are prepared accurately.
b) To ensure that the annual financial statements are prepared according to GAAP
c) To verify that the information used in preparing the annual financial statements is reliable
d) All of the above

3) [2 points] Consider two securities, A & B. Suppose a third security, C, has the same cash flows as A and B combined. Given this information about securities A,B, & C, which of the following statements is INCORRECT?

a) If the total price of A and B is cheaper than the price of C, then we could make a profit selling A and B and buying C
b) Price(C) = Price(A) + Price(B)
c) Because security C is equivalent to the portfolio of A and B, by the law of one price they must have the same price
d) The relationship known as value additivity says that the value of a portfolio is equal to the sum of the values of its parts

4) [2 points] Which of the following statements is FALSE?

a) Bonds are securities sold by governments and corporations to raise money from investors today in exchange for promised future payments
b) By convention the coupon rate is expressed as an effective annual rate
c) Bonds typically make two types of payments to their holders
d) The time remaining until the repayment date is known as the term of the bond

5) [2 points] Frank Dewey Esquire from the firm of Dewey, Cheatum, and Howe, has been offered an upfront retainer of €30,000 to provide legal services over the next 12 months to Taggart Transcontinental. In return for this upfront payment, Taggart Transcontinental would have access to 8 hours of legal services from Frank for each of the next 12 months. Frank's normal billable rate is €250 per hour for legal services. Assuming that Dewey's cost of capital is 12% EAR, then the NPV of his retainer offer is closest to:

a) -$7,500
b) -$7,400
c) $6,000
d) $7,400

Step #1 $\mathit{Monthly\ Interest\ Rate} = 1.12^{\frac{1}{12}} - 1 = 0.009488793$
Step #2 $\mathit{Monthly\ Opportunity\ Cost} = €250 \times 8 = €2000$
Step #3 $NPV = €30{,}000 - \frac{€2000}{0.009488793}\left(1 - \frac{1}{1.009488793^{12}}\right) = 7416.97$

6) [2 points] Which of the following statements is FALSE?

a) Given a 35% corporate tax rate, for every $1 in new permanent debt that the firm issues, the value of the firm increases by €0.65
b) The firm's marginal tax rate may fluctuate due to changes in the tax code and changes in the firm's income bracket
c) Many large firms have a policy of maintaining a certain amount of debt on their balance sheets
d) Typically, the level of future interest payments varies due to changes the firm makes in the amount of debt outstanding, changes in the interest rate on that debt, and the risk that the firm may default and fail to make an interest payment

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7) [2 points] The firm will pay the dividend to all shareholders who are registered owners on a specific date, set by the board, called the:

a) declaration date
b) record date
c) distribution date
d) ex-dividend date

8) [2 points] Which of the following statements is FALSE?

a) The option buyer, also called the option holder, holds the right to exercise the option and has a long position in the contract
b) The market price of the option is also called the exercise price
c) If the payoff from exercising an option immediately is positive, the option is said to be in-the-money
d) As with other financial assets, options can be bought and sold. Standard stock options are traded on organized exchanges, while more specialized options are sold through dealers

9) [2 points] Which of the following statements is NOT true regarding Angel Investors?

a) They are typically arranged as limited partnerships
b) For many start-ups, the first round of outside private equity financing is often obtained from them
c) Because their capital investment is often large relative to the amount of capital already in place at the firm, they typically receive a sizeable equity share in the business in return for their funds
d) These investors are frequently friends or acquaintances of the entrepreneur

10) [2 points] Luther Industries had sales of £980 million and a cost of goods sold of £560 million in 2018. A simplified balance sheet for the firm appears below:

Luther Industries Balance Sheet As of December 31, 2018 (millions of pounds)

Assets		**Liabilities and Equity**	
Cash	25	Accounts payable	60
Accounts receivable	85	Notes payable	425
Inventory	90	Accruals	45
Total current assets	200	Total current liabilities	530
Net plant, property, and equipment	6,100	Long term debt	2,725
Total assets	6,300	Total liabilities	3,255
		Common equity	3,045
		Total liabilities and equity	6,300

Calculate the number of days in Luther's Operating Cycle

a) 90
b) 59
c) 32
d) 27

$$Inventory\ Days = \frac{Inventory}{Average\ Daily\ COGS} = \frac{90}{560/365} = 58.66$$

$$Accounts\,Receivable\ days = \frac{Accounts\,Receivable}{Average\ Daily\ \text{Sales}} = \frac{980}{560/365} = 31.66$$

$$Operating\ Cycle = Inventory\ days + accounts\ receivable\ days = 58.66 + 31.66 = 90.32\ days$$

11) [5 points] Briefly explain the functions of financial markets.

There are five important functions of financial markets. They are:

- providing financing for corporations
- providing liquidity for investors
- reducing risk for investors
- providing information
- monitoring firms' financial performance

12) [5 points] What are some of the advantages of using the IRR method?

The main advantage of IRR is that it is easy to communicate. Financial managers tend to think in terms of percentages and find rates of return intuitively easy to grasp.

13) [5 points] Briefly explain how a firm's cost of equity is estimated using the capital asset pricing model (CAPM).

The first step estimates the beta of the firm's common stock by regressing the returns on the stock on the market returns using historical data. The expected stock return is estimated using CAPM [E(R) = rf + (beta)(rm - rf)]. Expected return is the estimate of the firm's cost of equity.

14) [5 points] Why do firms rely heavily on internal funds?

Internal funds, defined as depreciation plus retained earnings, make up a large portion of funds invested by corporations each year. The main reason is the cost of issuing new equity. The cost of issuing new equity is quite high, and corporations try to minimize these costs. The second reason might be to avoid the discipline of the security market. One third reason, is related with the information that issuing bonds or shares send to the markets. Relying on internal funds transmit to the markets a sounder financial situation and stronger expected cash flows.

15) [5 points] Briefly explain the trade-off theory of capital structure.

A firm's debt-equity decision can be thought of as a trade-off between interest tax shields and the present value of the costs of financial distress. These two interact to provide an optimal capital structure for a firm. This is called the trade-off theory.

16) [5 points] Explain how a firm wishing to invest in floating rate investments can use a swap to manage its interest rate exposure?

A firm desiring a floating rate investment but with a comparative advantage in obtaining a fixed-rate investment can invest in a fixed-rate investment and then enter into a swap arrangement with a counterparty to exchange the fixed rate of return for a floating rate return.

17) [5 points] Discuss the DuPont system.

The DuPont system is a quick way of looking at the performance of a firm or a division. ROA and ROE can be composed into component ratios, like asset turnover and operating profit margin, which can provide further guidance to an analyst attempting to understand the financial condition of the firm.

18) [5 points] List some of the different money market instruments available for short-term investments.

There are several money market instruments available for investments. The most important ones in the U.S. are: U.S. Treasury bills; Federal agency securities; certificates of deposit; commercial paper; bankers' acceptances; and repurchase agreements.

19) [20 points] NAFI Entertainment wants to develop a new videogame of historical adventure. For this project, the company is going to rent a small building for €10.000 per year. Rents are expected to grow at 2% per year. The project requires an up-front investment in several equipment of €30,000. After 2 years, the company will do a new investment of €20,000. Both investments will depreciate at the rate of 20% per year

The company thinks it will take two years developing the project. So, Nafi Entertainment expects to start selling the videogame in the beginning of the third year. The project will become obsolete after three years of sales. Net Working Capital is estimated in 20% of the following year revenues.

Expected revenues are of €100,000 per year. During the development phase, the costs, excluding rents and depreciations, are estimated to total €20,000. After this, expected costs of goods sold and other expenses, with the exception of rents and depreciations, are 40% of sales.

The cost of capital is 10% and the corporate tax rate is 20%.

a) [15 points] Estimate the Free Cash Flows of this project.

[Solution]

	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Revenues				100 000	100 000	100 000		
Cost and Expenses		20 000	20 000	40 000	40 000	40 000		
Rent		10 000	10 200	10 404	10 612	10 824		
Depreciation		6 000	6 000	10 000	10 000	10 000	4 000	4 000
EBIT		-36 000	-36 200	39 596	39 388	39 176	-4 000	-4 000
Taxes		-7 200	-7 240	7 919	7 878	7 835	-800	-800
EBIT(1-tc)		-28 800	-28 960	31 677	31 510	31 341	-3 200	-3 200
D		6 000	6 000	10 000	10 000	10 000	4 000	4 000
CAPEX	30 000		20 000					
VAR NWC		0	20 000	0	0	-20 000	0	0
FCF	**-30 000**	**-22 800**	**-62 960**	**41 677**	**41 510**	**61 341**	**800**	**800**

b) [5 points] Should NAFI Entertainment do this project?

[Solution]

$$NPV = -30000 - \frac{22800}{1.1} + -\frac{62960}{1.1^2} + \frac{41677}{1.1^3} + \frac{41510}{1.1^4} + \frac{61341}{1.1^5} + \frac{800}{1.1^6} + \frac{800}{1.1^7} = -4,146.06$$

20) [20 points] NAFI Entertainment 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	9 648	
Cash	68 788	
Treasury-bills	61 200	
Faculty wages	39 132	
Dividend paid	54 000	
Energy Expenses	13 032	
Loan Interest	14 400	
Long term loan		162 000
Other operational expenses	385 736	
Opening inventory		
Plant and Equipment - cost	325 476	
Plant and Equipment - depreciation		174 708
Directors' salaries	15 120	
Property - Cost	352 800	
Property - depreciation		52 416
Retained Earnings		76 248
Revenue		772 080
Sales staff commission	18 720	
Sales staff salaries	42 660	
Share capital		270 000
Accounts Payable		57 720
Accounts Receivable	164 460	
	1 565 172	**1 565 172**

Values in €000

Additional information (€000) not reflected in the trial balance

- The company spent in Development €3000
- Depreciation for the current year has still to be recorded on the following basis:
  - Property: 2% straight line
  - Plant and equipment: 20% straight line
- The corporate tax rate is 21%

[Solution]

NAFI Entertainment
Statement of Profit of Loss

Revenue	772 080
Personal Costs	125 280
Operating costs	398 768
Depreciation	72 151
Operating Profit/EBIT	**175 881**
Finance Charge	14 400
Profit before tax	**161 481**
Tax expense	33 911
Profit for the year	**127 570**

NAFI Entertainment
Statement of Financial Position

Non-current Assets	382 001
Current Assets	
Accounts Receivable	164 460
Cash and Equivalents	126 988
	291 448
Total Assets	**673 449**
Equity	
Share capital	270 000
Retained Earnings	149 818
	419 818
Non-current liabilities	
Loan	162 000
Current Liabilities	
Accounts Payable	57 720
Tax	33 911
Accruals	
	91 631
Total Liabilities	**253 631**
Total Equity+Liabilities	**673 449**