

Finance and Financial Reporting

Master in Actuarial Science

Exam ER

01/02/2017

3 HOURS

Name: _____ No. _____

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 ultimate financial goal of a corporation is to:
- a) minimize stockholder risk
 - b) maximize profit
 - c) maximize value of the corporation to the stockholders**
 - d) increase size of the firm
- 2) [2 points] Retained earnings represent:
- a) Cash available for future investments
 - b) Dividends distributed to shareholders
 - c) Earnings not distributed**
 - d) None of the above
- 3) [2 points] Which of the following statements is true?
- a) An increase in an asset account can be balanced by an increase in a liability account**
 - b) An increase in a liability account can be balanced by an increase of a component of the shareholders' equity account
 - c) An increase in an asset account can be balanced by an increase in another asset account
 - d) None of the above
- 4) [2 points] In December 2016, Outside.Box (O.Box) had a share price of €39.20. They had 91.33 million shares outstanding, and a market-to-book ratio of 3.76. In addition, O.Box had €845.01 million in outstanding debt, €163.82 million in net income, and cash of €257.09 million. O.Box's enterprise value is closest to:
- a) €952.16 million
 - b) €3,580.14 million
 - c) €4,168.06 million**
 - d) €4,425.15 million

[Solution]

$$\text{Enterprise Value} = \text{MV Equity} + \text{Debt} - \text{Cash} = \$39.2 \times 91.33 + \$845.01 - \$257.09 = \$4168.06$$

- 5) [2 points] Which of the following statements is false regarding audit reporting?
- a) The auditor's opinion should be expressed in a written report.
 - b) The auditor should provide an opinion in accordance with the auditor's findings or state that an opinion cannot be expressed.
 - c) The opinion should state whether the financial statements are presented fairly, in all material respects, in accordance with the applicable financial reporting framework.
 - d) The above statements are true.**

- 6) [2 points] Equity investment in start-up private companies is called:
- venture capital**
 - mezzanine financing
 - initial public offering (IPO)
 - seasoned equity offering (SEO).
- 7) [2 points] If the stock makes a dividend payment before the expiration date, then the put-call parity relation is:
- Value of call = value of put + share price - present value (PV) of dividend - PV of exercise price.**
 - Value of call = value of put - share price + PV of dividend - PV of exercise price.
 - Value of call = value of put + share price + PV of dividend + PV of exercise price.
 - Value of call = value of put + share price + PV of dividend - PV of exercise price.
- 8) [2 points] Consider the following data for a European option: Expiration = 6 months; Stock price = €80; Exercise price = €75; Call option price = €12; Risk-free rate = 5% per year. Using put-call parity, the price of a put option having the same exercise price and expiration date, is closest to: (Hint: Use continuous compounding.)
- €3.07
 - €5.15**
 - €11.43
 - €3.42

[Solution]

Value of put = value of call - share price + PV of dividend + PV of exercise price
 $= 12 - 80 + 75 * (e^{-0.05 * 0.5}) = 12 - 80 + 73.15 = \$5.15.$

- 9) [2 points] The market value of Outside.Box's equity is €15 million and the market value of its debt is €5 million. If the required rate of return on the equity is 20% and that on its debt is 8%, calculate the company's cost of capital. (Assume no taxes.)
- 20%
 - 17%**
 - 14%
 - 11%
- $WACC = 15/20 * 20\% + 5/20 * 8\% = 3/4 * 20\% + 1/4 * 8\% = 15\% + 2\% = 17\%$
- 10) [2 points] Outside.Box is considering investing in a new project. The project will need an initial investment of €2,400,000 and will generate €1,200,000 (after-tax) cash flows for three years. Calculate the NPV for the project if the cost of capital is 15%.
- €169,935
 - €1,200,000
 - €339,870**
 - €125,846

[Solution]

$$\text{NPV} = -2,400,000 + [(1,200,000)/(1.15)] + [(1,200,000)/(1.15)^2] + [1,200,000/(1.15)^3] = 339,870.$$

11) [5 points] Briefly explain the sequence of cash flows between financial markets and the firm.

[Solution]

- Cash is raised by selling financial assets to investors.
- Cash is invested in the firm's operation and used to purchase real assets.
- Cash is generated by the firm's operations.
- Cash is reinvested or returned to investors.

12) [5 points] Discuss some examples of conflicts of interest that may arise between bondholders and stockholders when a firm is in financial distress.

[Solution]

When a firm is in distress, the shareholders have incentives to protect the value of their securities and hence take actions that—although increasing the value of equity—might decrease the overall value of the firm and reduce the debtholders' wealth. Some examples of such actions are risk shifting, refusing to contribute equity capital, playing for time, and bait and switch.

13) [5 points] Briefly describe the sequence of events of a firm's dividend payment

[Solution]

The board of directors sets the dividend for a firm. The date on which the board of directors announces the dividend is called the declaration date. Dividends will be paid to those who are registered shareholders as of the record date. Two business days prior to the record date is the ex-dividend date. Shares bought on the ex-dividend date or later do not come with the dividend. Dividend checks are mailed to shareholders on the payment date.

14) [5 points] Briefly describe the traditionalists' position on capital structure.

[Solution]

The traditional view of debt policy states that moderate amounts of debt increase the expected return on equity, but not as fast as proposed by M&M. Therefore, the weighted average cost of capital declines initially at low levels of debt and later increases at higher levels of debt. At high levels of debt, the rate of return increases at a rate faster than that proposed by M&M. Hence, there is an optimal capital structure for a firm lying between these two situations.

15) [5 points] Briefly explain the restrictive covenants in a bond indenture

[Solution]

The restrictive covenants, also called protective covenants, are placed in the bond indenture

to protect the bondholders' interests. There are two types of covenants, negative and positive (affirmative). Negative covenants limit or prohibit the company from taking certain actions like paying huge dividends to stockholders. Affirmative covenants specify certain duties on the company. These have to be exhaustive, as courts have held that only written covenants count

16) [5 points] Discuss the fundamental trade-off involved in cash management

[Solution]

The trade-off concerns both how much cash (liquidity which is safer VS return) and between holding cash, which provides liquidity but no interest, and holding securities, which provide interest, but less liquidity. This trade-off is used to develop cash management models

17) [5 points] Explain how a firm wishing to invest in floating rate investments can use a swap to manage its interest rate exposure?

[Solution]

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.

18) [10 points] A firm has a project with an NPV of -\$52 million. If it has access to risk-free government financing that can create a permanent annual tax shield of \$5 million, what is the APV of the project assuming the risk-free interest rate is 6%?

[Solution]

PV tax shield = $5 / .06 = 83.3$ million. APV = $-52 + 83.3 = 31.3$.

- 19) [20 points] Consider the following income statement and other information:

| Luther Corporation | | |
|--|-------------|-------------|
| Consolidated Income Statement | | |
| Year ended December 31 (in \$ millions) | | |
| | 2009 | 2008 |
| Total sales | 610.1 | 578.3 |
| Cost of sales | (500.2) | (481.9) |
| Gross profit | 109.9 | 96.4 |
| Selling, general, and administrative expenses | (40.5) | (39.0) |
| Research and development | (24.6) | (22.8) |
| Depreciation and amortization | (3.6) | (3.3) |
| Operating income | 41.2 | 31.3 |
| Other income | --- | --- |
| Earnings before interest and taxes (EBIT) | 41.2 | 31.3 |
| Interest income (expense) | (25.1) | (15.8) |
| Pre-tax income | 16.1 | 15.5 |
| Taxes | (5.5) | (5.3) |
| Net income | 10.6 | 10.2 |
| Price per share | \$16 | \$15 |
| Shares outstanding (millions) | 10.2 | 8.0 |
| Stock options outstanding (millions) | 0.3 | 0.2 |
| Stockholders' Equity | 126.6 | 63.6 |
| Total Liabilities and Stockholders' Equity | 533.1 | 386.7 |

- a) [5 points] If Luther's accounts receivable were \$55.5 million in 2009, then calculate Luther's accounts receivable days for 2009.

[Solution]

$$\text{Accounts receivable days} = \frac{\text{accounts receivable}}{\text{sales}/365} = \frac{55.5}{610.1/365} = 33.2 \text{ days.}$$

- b) [5 points] Luther's Operating Margin for the year ending December 31, 2008 is closest to:

[Solution]

$$\text{Operating Margin} = \text{Operating Income}/\text{Sales} = 31.3/578.3 = .054 \text{ or } 5.4\%$$

- c) [5 points] Luther's return on equity (ROE) for the year ending December 31, 2009 is closest to:

[Solution]

$$\text{ROE} = \text{Net income}/\text{shareholders' equity} = 10.6/126.6 = .084 \text{ or } 8.4\%$$

- d) [5 points] Luther's return on assets (ROA) for the year ending December 31, 2009 is

closest to:

[Solution]

ROA = (Net income + Interest Expense)/total assets.

This is a little tricky in that total assets aren't given in the problem. The student must remember the basic balance sheet equation $A = L + SE$. Total Liabilities and Shareholders' Equity is given and this is the same as total assets. So $ROA = (10.6+25.1/533.1 = 0.067$ or 6.7%

20) [15 points] The Outside.Box is a small-sized business that makes and sells computers on a limited national market.

Balance sheet at 31 December X1 (i.e. before profit appropriation by the General Assembly) (in 000 €)

| Balance sheet (in thousands of €) | | | |
|-----------------------------------|--------------|-------------------------------|-----------------------------|
| Fixed assets | | | Shareholders' equity |
| Manufacturing equipment | 600 | Capital | 500 |
| Equipment gross value | 900 | Accumulated retained earnings | 200 |
| Accumulated depreciation | -300 | Net income for X1 (a) | 168 |
| Sub total | 600 | Sub total | 868 |
| Current Assets | | | |
| Inventories: | | | |
| Raw materials and Components | 80 | Liabilities | |
| Finished products | 120 | Financial debts | 100 |
| Accounts receivable (b) | 140 | Accounts payable (c) | 110 |
| Cash at bank | 250 | Income tax payable (c) | 112 |
| Sub total | 590 | Sub total | 322 |
| Total | 1,190 | Total | 1,190 |

a) To be appropriated in X2 by the General Assembly: management recommends, and the General Assembly approves, that one half of the profit of X1 be distributed.

(b) To be received in X2.

(c) To be paid in X2.

The following budgeted (anticipated) activities are considered for period X2 (000 €):

1. Sales revenue budget: 1,300 (of which 210 will be received from customers during X3).
2. Purchases budget (raw materials): 520 (of which 140 will be paid cash to suppliers during X3).
3. Rental expenses budget: 220 (entirely paid before the end of year).
4. Estimated property taxes: 100 (entirely paid before the end of year).
5. Remunerations and social charges budget: 400 (entirely paid before the end of year).
6. Financing budget: repayment of financial debt for 60. Interest expense for the year: ten (entirely paid before the end of year).
7. Investment budget: acquisition of fixed assets for 200 (entirely paid before the end of year).

8. Total depreciation expense budget for all long-lived assets (new and old): 20.
9. New shares will be floated on 1 January X2. The net proceeds, all in cash, amount to 100, received from old and new shareholders.
10. Budgeted ending inventory levels: Raw materials inventory: 120; Finished products inventory: 140.

The income tax rate is 40 percent (taxes are recognized in the year of the earnings they pertain to, and are paid in the following year. Therefore, they are considered a liability in the year to which they relate).

Prepare the two following pro forma (forecasted) documents for year X2:

- a) Statement of Profit or Loss (income statement) [7.5 points]
- b) Statement of Financial Position (balance sheet) [7.5 points]

[Solution]

Income statement (in thousands of CU)

| Operating expenses | | Operating revenue | |
|--------------------------------|--------------|--------------------------------|--------------|
| Purchases of raw materials | 520 | Sales | 1,300 |
| Change in inventory RM (B - E) | -40 | Change in inventory FP (E - B) | 20 |
| External charges | 220 | | |
| Other taxes | 100 | | |
| Personnel expenses | 400 | | |
| Depreciation expense | 20 | | |
| Financial charges | 10 | Financial income | 0 |
| Exceptional charges | 0 | Exceptional income | 0 |
| Sub total | 1,230 | Sub total | 1,320 |
| Income tax | 36 | | |
| <i>Net income</i> | <i>54</i> | <i>Net loss</i> | <i>0</i> |
| Total | 1,320 | Total | 1,320 |

RM = raw materials; FP = finished products; B = beginning balance; E = ending balance

Balance sheet (in thousands of CU)

| Fixed assets | | Shareholders' equity | |
|-------------------------|--------------|-----------------------------|--------------|
| Manufacturing equipment | 780 | Capital | 600 |
| | | Reserves | 284 |
| Current Assets | | Net Income/loss | 54 |
| | | Sub total | 938 |
| Raw materials | 120 | Liabilities | |
| Finished products | 140 | Financial debts | 40 |
| | | Bank overdraft | 96 |
| Accounts receivable | 210 | Accounts payable | 140 |
| Cash at bank | 0 | Income tax payable | 36 |
| Total | 1,250 | Total | 1,250 |

ADDITIONAL SPACE TO ANSWER

ADDITIONAL SPACE TO ANSWER

SCRAP PAPER

SCRAP PAPER