

PART II (SECOND AND FINAL YEAR)

ACCOUNTING AND FINANCE

AcF 302 CORPORATE FINANCE

(2 HOURS PLUS 15 MINUTES READING TIME)

Answer **ALL** questions from Section A on the multiple-choice answer sheet provided.

Answer **ONE** question from Section B. Answer **ONE** question from Section C.

Answer Section B and Section C in separate answer booklets.

A list of important formulae is included at the end of the examination paper.

Section A (30 marks)

Section A consists of Questions 1 to 10. Answer **ALL** questions.

1) Which of the following statements is FALSE?

- A) In the weighted average cost of capital (WACC) and adjusted present value (APV) valuation methods, we value a project based on its free cash flow, which is computed ignoring interest and debt payments.
- B) In the flow-to-equity valuation method, the cash flows to equity holders are discounted using the weighted average cost of capital.
- C) In the flow-to-equity (FTE) valuation method, we explicitly calculate the free cash flow available to equity holders taking into account all payments to and from debt holders.
- D) The project's free cash flow to equity shows the expected amount of additional cash the firm will have available to pay dividends (or conduct share repurchases) each year.

2) Which of the following statements regarding real options is FALSE?

- A) If there is a lot of uncertainty, the benefit of waiting is diminished.
- B) In the real option context, the dividends correspond to any value from the investment that we give up by waiting.
- C) By delaying an investment, we can base our decision on additional information.
- D) Given the option to wait, an investment that currently has a negative NPV can have a positive value.

3) The share of any positive return generated by venture capital firms that is taken by the firm's general partners is known as:

- A) carried interest.
- B) partner return.
- C) carried capital.
- D) angel interest.

4) Which of the following statements regarding seasoned equity offerings (SEOs) is FALSE?

- A) SEO rights offers have lower costs than cash offers.
- B) Researchers have found that, on average, the market greets the news of an SEO with a price increase.
- C) Although not as costly as initial public offerings (IPOs), seasoned offerings are still expensive.
- D) The decision to raise financing externally usually implies that a firm plans to pursue an investment opportunity.

5) When banks resecuritize other asset-backed securities, the new asset-backed security is known as a:

- A) mortgage-backed security.
- B) double-barreled security.
- C) collateralized debt obligation.
- D) resecuritized security.

6) The term 2/10 net 30 means:

- A) If the invoice is paid within 10 days a 2% discount can be taken. If the invoice is paid between 11 and 29 days a 1% discount can be taken. After 30 days the full invoice is due.
- B) If the invoice is paid within 2 days a 10% discount can be taken, otherwise the full invoice is due in 30 days.
- C) If the invoice is paid within 2 days a 10% discount can be taken, otherwise a 2% discount can be taken if the invoice is paid in 30 days.
- D) If the invoice is paid within 10 days a 2% discount can be taken, otherwise the full invoice is due in 30 days.

7) Which of the following is NOT a specific financing option for temporary working capital?

- A) Secured financing
- B) Commercial paper
- C) Bank loans
- D) Treasury bills

8) Which of the following statements is FALSE?

- A) Chief among the costs associated with size is that larger firms are more difficult to manage.
- B) For most investors an investment in the stock market is a zero-NPV investment.
- C) Diversification benefits are by far the most common justification that bidders give for the premium they pay for a target.
- D) An acquirer might be able to add economic value, as a result of an acquisition, that an individual investor cannot add.

9) Agency costs are best defined as:

- A) the costs imposed on a corporation through the laws and regulations that control corporations.
- B) the costs a corporation incurs as the result of fraud.
- C) the costs that arise when there are conflicts of interest between a firm's stakeholders.
- D) the costs associated with compensating managers when ownership and control are separated in a firm.

10) Which of the following statements is FALSE?

- A) When the CEO is also chairman of the board, the nominating letter offering a seat to a new director comes from her. This process merely serves to reinforce the sense that the outside directors owe their positions to the CEO and work for the CEO rather than for the shareholders.
- B) Over time, most of the independent directors will have been nominated by the CEO. Even though they have no business ties to the firm, they are still likely to be friends or at least acquaintances of the CEO.
- C) Researchers have found the surprisingly robust result that larger boards are associated with greater firm value and performance.
- D) The CEO can be expected to stack the board with directors who are less likely to challenge her.

(3 marks for each question)

(Total 30 marks)

Section B (35 marks)

Answer **EITHER** Question 11 **OR** Question 12.

Answer all parts of the chosen question.

Question 11

a) Baker Skateboard company is planning to develop a new electric skateboard. In order for the project to be successful, the company must develop a lightweight battery, a new deck to accommodate the lightweight battery, and a remote that is easy to operate while moving in an open environment. The company estimates the following costs, times, and probabilities of success for each component of the new skateboard:

<u>Technology</u>	<u>Cost (in thousands)</u>	<u>Time</u>	<u>Probability of Success</u>
Deck	£50	6 months	0.75
Battery	£200	3 years	0.25
Remote	£250	1 year	0.50

All three risks are idiosyncratic and the risk-free rate of interest is 5%. The company does not have the resources to develop all the components at the same time. Therefore, management needs to decide in what order to develop the technologies.

REQUIRED:

i) What is the optimal order to develop the technologies? (8 marks)

ii) Assume Baker has estimated that, if all stages are successful, they can then develop the electric skateboard and start selling it. At that point in time, the present value of all future profits from selling the skateboard will be £4 million. If Baker does the three stages in the correct order, what is the NPV of the project? (7 marks)

iii) Suppose instead that Baker has the ability to develop all three technologies simultaneously. What is the NPV of the project in this case? Does the staging of investment decisions add value? (6 marks)

b) Choices associated with a company's initial public offering (IPO) include the type of shares to be sold and the mechanism the underwriter will use to sell the stock.

REQUIRED:

i) Briefly describe the difference between primary and secondary offerings in the context of IPOs. (4 marks)

ii) Briefly describe the three alternative mechanisms that an underwriter can use to sell a company's stock in an IPO. Under which mechanism does the underwriter face the highest risk?

(7 marks)

iii) Which company's IPO is considered the most significant example of the use of the auction mechanism? What were the attractions of the auction mechanism to the company?

(3 marks)

(Total 35 marks)

Question 12

a) Three years ago, you founded your own company. You invested £110,000 of your money and received 5.5 million shares of Series A stock. Since then, your company has been through three additional rounds of financing.

Round	Share Price (£)	Number of Shares
Series B	0.80	1,100,000
Series C	2.50	700,000
Series D	7.00	500,000

REQUIRED:

- i) What is the pre-money valuation for the Series D funding round?
(4 marks)
 - ii) What is the post-money valuation for the Series D funding round?
(4 marks)
 - iii) Assuming that you own only the Series A stock, what percentage of the firm do you own after the last funding round?
(3 marks)
 - iv) Suppose that the company wants to raise an additional £10 million in a new funding round (Series E). What is the largest fraction of the firm that can be offered to new investors without leading to a down round?
(6 marks)
- b) Explain the difference between a secured and an unsecured corporate bond.
(4 marks)
- c) Describe briefly the four characteristics of IPOs that puzzle financial economists.
(8 marks)
- d) Goodwill Trains is considering a £250 million investment to launch a new rail line. The project is expected to generate a free cash flow of £32 million per year forever, and its unlevered cost of capital is 8%. Goodwill's marginal corporate tax rate is 35%. Suppose instead that to fund the investment Goodwill will take on £150 million in permanent debt with the remainder of the investment funded through issuance of new equity. Assume Goodwill will incur a 2% (after-tax) underwriting fee on the new debt issue and a 5% underwriting fee on the issuance of new equity. If management believes Goodwill's current share price of £25 is £3 less than its true value, what is the NPV of Goodwill's new rail line?
(6 marks)

(Total 35 marks)

Section C (35 marks)

Answer **EITHER** Question 13 **OR** Question 14.

Answer all parts of the chosen question.

Question 13

a) Suppose the purchase price of a bulldozer is £90,000, its residual value in four years is certain to be £15,000, its economic life is for 8 years, and there is no risk that the lessee will default on the lease. Assume that capital markets are perfect and the risk-free interest rate is 6% APR with monthly compounding.

REQUIRED:

- i) Calculate the monthly lease payments for a four-year lease of the bulldozer.
(3 marks)
- ii) According to accounting standards, is this a Capital Lease or an Operating Lease? Explain why.
(2 marks)
- iii) Suppose that instead of leasing the bulldozer, the company is considering purchasing a bulldozer outright by borrowing the purchase price using a four-year annuity loan. Calculate the monthly loan payments for a four-year loan to purchase the bulldozer.
(3 marks)
- iv) Calculate the monthly lease payments for a four-year £1.00 out lease of the bulldozer.
(2 marks)

b) Martin Manufacturing has earnings per share (EPS) of £3.00, 5 million shares outstanding, and a share price of £32. Martin is considering buying Avco Industries, which has earnings per share of £2.50, 2 million shares outstanding, and a share price of £20. Martin will pay for Avco by issuing new shares. There are no expected synergies from the transaction. Assume that Martin pays no premium to acquire Avco.

REQUIRED:

- i) Calculate Martin's price-earnings (P/E) ratio pre-merger.
(2 marks)

- ii) Calculate Martin's total number of shares in the new merged firm. (2 marks)
- iii) Calculate the total earnings of the merged firm. (3 marks)
- iv) Calculate the EPS of the merged firm. (2 marks)
- v) Calculate the price-earning (P/E) ratio post-merger (1 mark)

c) Answer briefly the following two questions related to CEO compensation:

i) Explain briefly how CEO's pay can be linked to firm performance. What are some of the negative effects of increasing the sensitivity of managerial pay to firm performance?

(10 marks)

ii) Explain what backdating is and why CEOs engage in this activity?

(5 marks)

(Total 35 marks)

Question 14

a) Bailrigg Royal Infirmary plans to purchase or lease a £2 million-dollar CT scanner. If purchased, the CT scanner will be depreciated on a straight-line basis over five years, after which it will be worthless. If leased, the annual lease payments will be £500,000 per year for five years. Bailrigg Royal Infirmary's borrowing cost is 8%, and its tax rate is 35%.

REQUIRED:

i) If Bailrigg Royal Infirmary purchases the CT scanner, what is the amount of the lease-equivalent loan?

(5 marks)

ii) Is Bailrigg Royal Infirmary better off leasing the CT scanner or financing the purchase of the CT scanner with a lease-equivalent loan? Explain.

(3 marks)

iii) By how much is the Bailrigg Royal Infirmary better off?

(2 marks)

b) Sheffield Steel Ltd. has earnings per share of £2. It has 10 million shares outstanding and is trading at £20 per share. Sheffield Steel Ltd. is thinking of buying Associated Steel, which has earnings per share of £1.25, 4 million shares outstanding, and a price per share of £15. Sheffield Steel Ltd. will pay for Associated Steel by issuing new shares. There are no expected synergies from the transaction. Sheffield offers an exchange ratio such that, at current pre-announcement share prices for both firms, the offer represents a 20% premium to buy Associated Steel.

REQUIRED:

i) What is the price per share of the combined corporation after the merger?

(5 marks)

ii) What is the actual premium Sheffield will pay?

(5 marks)

c) Explain briefly the three main reasons for short term financial needs and give an example of each.

(3 marks)

d) Provide an example of a company operating in an industry very likely to suffer short term financial needs and explain why.

(4 marks)

e) Briefly explain how secured loans work as a method to cover short term financial needs.

(4 marks)

f) Explain what the matching principle is in the context of working capital management.

(4 marks)

(Total 35 marks)

END OF PAPER

Formula Sheet

Present value of a perpetuity

$$PV = \frac{C}{r}$$

Present value of a growing perpetuity

$$PV = \frac{C_1}{r - g}$$

Present value of an annuity

$$PV = \frac{C}{r} \left(1 - \frac{1}{(1 + r)^T} \right)$$

Present value of an annuity due

$$PV = C \left(1 + \frac{1}{r} \left(1 - \frac{1}{(1 + r)^{T-1}} \right) \right)$$

Effective annual rate

$$EAR = \left(1 + \frac{i}{m} \right)^m - 1$$

Weighted Average Cost of Capital

$$r_{wacc} = \frac{E}{E + D} r_E + \frac{D}{E + D} r_D (1 - \tau_c)$$

Project-based WACC

$$r_{wacc} = r_U - d \tau_c r_D$$

Project-based WACC with Annual Debt Adjustment

$$r_{wacc} = r_U - d \tau_c r_D \frac{1 + r_U}{1 + r_D}$$

Unlevered Cost of Capital

$$r_U = \frac{E}{E + D} r_E + \frac{D}{E + D} r_D$$

Cost of Equity

$$r_E = r_U + \frac{D}{E} (r_U - r_D)$$

Debt Capacity

$$D_t = d \times V_t^L$$

Adjusted Present Value

$$V^L = APV = V^U + PV(\text{Interest Tax Shield})$$

Free Cash Flow to Equity

$$FCFE = FCF - (1 - \tau_c) \times (\text{Interest Payments}) + (\text{Net Borrowing})$$

Free Cash Flow

$$FCF = EBIT(1 - \tau_c) + \text{Depreciation} - \text{Capex} - \Delta NWC$$

Levered Value with a Constant Interest Coverage Ratio

$$V_L = (1 + \tau_c k) V_U$$

Annually Adjusted Debt

$$PV(\tau_c \times Int_t) = \frac{\tau_c \times Int_t}{(1 + r_U)^{t-1}(1 + r_D)} = \frac{\tau_c \times Int_t}{(1 + r_U)^t} \times \left(\frac{1 + r_U}{1 + r_D} \right)$$

$$r_{wacc} = r_U - d \tau_c r_D \frac{1 + r_U}{1 + r_D}$$

Personal Taxes

$$\tau^* = 1 - \frac{(1 - \tau_c)(1 - \tau_e)}{(1 - \tau_i)}$$

$$r_D^* \equiv r_D \frac{(1 - \tau_i)}{(1 - \tau_e)}$$

Unlevered Cost of Capital (CAPM)

$$r_U = r_f + \beta_U (E[R_{mkt}] - r_f)$$

Black-Scholes Formula

$$C = S^x N(d_1) - PV(K) N(d_2)$$

$$d_1 = \frac{\ln[S^x / PV(K)]}{\sigma \sqrt{T}} + \frac{\sigma \sqrt{T}}{2}$$

$$d_2 = d_1 - \sigma \sqrt{T}$$

Failure Cost Index

$$FCI = \frac{1 - PV(\text{success})}{PV(\text{investment})}$$

Leasing

$$PV(\text{Lease payments}) = \text{Price of the Asset} - PV(\text{residual value of the asset})$$

$$FCF(\text{Buy})_t = -\text{CapEx}_t + \text{Depreciation tax shield}_t$$

$$FCF(\text{Lease})_t = -\text{Lease payments}_t + \text{Income tax savings}_t$$

$$\text{Incremental free cash flow}_t = FCF(\text{Lease} - \text{Buy})_t = FCF(\text{Lease})_t - FCF(\text{Buy})_t$$

$$\text{Lease equivalent loan} = PV(FCF(\text{Lease} - \text{Buy})_1 + \dots + FCF(\text{Lease} - \text{Buy})_T)$$

Valuation and the takeover process

$$\text{Amount Paid} = \text{Target's Pre-Bid Market Cap.} + \text{Acquisition Premium}$$

$$\text{Value Acquired} = \text{Target stand alone value} + PV(\text{Synergies})$$

$$\text{Exchange ratio} = \frac{x}{N_T} < \frac{P_T}{P_A} \left(1 + \frac{S}{T}\right)$$