2022 EXAMINATIONS

Lancaster University

PART II (SECOND AND FINAL YEAR)

ACCOUNTING AND FINANCE

AcF 302 CORPORATE FINANCE

(Duration: 2.5 hours plus 30 minutes upload time)

Answer **ALL** questions from Section A.

Answer **ALL** questions from Section B.

Answer **ONE** question from Section C.

This exam is open-book.

Section A

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

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1) Which of the following statements is FALSE?

1. In the flow-to-equity valuation method, the project's free cash flows are discounted using the equity cost of capital.
2. With a constant interest coverage policy, the value of the interest tax shield is proportional to the project's levered value.
3. A target leverage ratio means that the firm adjusts its debt proportionally to the project's market value.
4. When a company's borrowing to finance a project is set according to a predetermined schedule, the interest tax shields on this debt should be discounted using the unlevered cost of capital.

A. Statement 1.
B. Statement 2.
C. Statements 2 and 4.
D. Statements 1 and 2.

2) Suppose you want to calculate the present value of the final-year's interest tax shield for a project that has a life of six years. The following formula

$$\boldsymbol{PV\ (ITS_6) = ITS_6/(1 + R_D)^6}$$

should be used when:

A. the debt associated with the interest tax shield is permanent.
B. the debt associated with the interest tax shield is predetermined.
C. the debt is adjusted continuously to maintain a target leverage ratio.
D. the debt is adjusted periodically to maintain a target leverage ratio.

3) Which of the following statements is FALSE?

1. Real options to wait can be less valuable in high-tech industries with rapid technological changes and first mover advantages.
2. When an independent project has no option to delay, we should usually invest in it when its NPV is greater than zero.
3. In the real option context, the forgone dividends correspond to the additional cost of the investment that we incur by delaying the investment.
4. Instead of raising the bar on the NPV, the hurdle rate rule reduces the discount rate.

A. Statement 1.
B. Statements 2 and 4.
C. Statements 3 and 4.
D. Statements 1 and 3.

4) Which of the following statements is FALSE?

A. The general partners work for the venture capital firm and run the venture capital firm; they are called venture capitalists.
B. An important consideration for investors in private companies is their exit strategy—how they will eventually realize the return from their investment.
C. When a company founder decides to sell equity to outside investors for the first time, it is common practice for private companies to issue common stock rather than preferred stock to raise capital.
D. Institutional investors such as pension funds, insurance companies, endowments, and foundations manage large quantities of money.

5) Which of the following statements regarding best efforts IPOs is FALSE?

A. For smaller IPOs, the underwriter commonly accepts the deal on this basis.
B. The underwriter does not guarantee that the stock will be sold, but instead tries to sell all the stock on offer in the primary market within an agreed price range.
C. Often these arrangements have an all-or-none clause: either all of the shares are sold in the IPO, or the deal is called off.
D. If the entire issue does not sell out, the underwriter is on the hook for the unsold shares.

6) Which of the following statements regarding bonds is FALSE?

A. By including more covenants, issuers increase their costs of borrowing.
B. Once bonds are issued, equity holders have an incentive to increase dividends at the expense of debt holders.
C. Covenants may restrict the level of further indebtedness and specify that the issuer must maintain a minimum amount of working capital.
D. If the covenants are designed to reduce agency costs by restricting management's ability to take negative NPV actions that exploit debt holders, then the reduction in the firm's borrowing cost can more than outweigh the cost of the loss of flexibility associated with covenants.

7) Which of the following statements regarding callable bonds is FALSE?

A. The holder of a callable bond faces reinvestment risk precisely when it hurts: when market rates are lower than the coupon rate she is currently receiving.
B. When yields have risen, the issuer will not choose to exercise the call on the callable bond.
C. The issuer will exercise the call option only when the prevailing market rate exceeds the coupon rate of the bond.
D. A callable bond is relatively less attractive to the bondholder than the identical non-callable bond.

8) Which of the following statements is FALSE?

A. Because investment in permanent working capital is required so long as the firm remains in business, it constitutes a long-term investment.
B. Because temporary working capital represents a short-term need, the firm should finance this portion of its investment with short-term financing.
C. Temporary working capital is the difference between the lowest level of investment in short-term assets and the permanent working capital investment.

D. The matching principle states that short-term needs should be financed with short-term debt and long-term needs should be financed with long-term sources of funds.

9) Which of the following statements regarding economies of scale and scope is FALSE?

A. Cost-reduction synergies are hard to predict and achieve.
B. Because the CEOs of small firms receive information so quickly, small firms are often able to react in a timely way to changes in the economic environment.
C. Synergies usually fall into two categories: cost reductions and revenue enhancements.
D. There may also be costs associated with the size of large enterprises.

10) Which of the following statements regarding incentives to mitigate the conflicts of interest in a corporation is FALSE?

A. The incentives come from owning stock in the company and from compensation that is sensitive to performance.
B. The role of the corporate governance system is to mitigate the conflict of interest that results from the combination of ownership and control without unduly burdening managers with the risk of the firm.
C. Punishment comes when a board fires a manager for poor performance or fraud, or when, upon failure of the board to act, shareholders or raiders launch control contests to replace the board and management.
D. The corporate governance system attempts to align interests by providing incentives for taking the right action and punishments for taking the wrong action.

(3 marks for each question)

(Total 30 marks)

Section B

Answer **ALL** questions in this section.

Question 11

Vega Industries is considering a new project. The project is expected to increase Vega's free cash flow by £12 million the first year, and this cash flow is expected to decline at a rate of 0.5% per year from then on. The project will cost £130 million. Vega currently maintains a constant equity-to-debt ratio of 3, its corporate tax rate is 21%, its cost of debt is 5.5%, and its cost of equity is 10%.

REQUIRED:

i) How much equity does Vega need to issue to finance the project while maintaining its equity-to-debt ratio?

(5 marks)

ii) Does the value of existing equity change? Show your workings.

(2 marks)

iii) Suppose that the cost of the project was £30 million instead of £130 million. Calculate the dividend that could be paid to shareholders as a result of the project.

(2 marks)

iv) Calculate the free cash flow to equity of the project in year 3.

(3 marks)

v) Suppose that Delta Systems, a company operating in the same industry as Vega, has no debt initially (i.e., it is an all equity financed company). Delta's current market capitalization is £85 million. The management of the company has decided to add debt for the first time to its capital structure by borrowing £42 million in permanent debt. Delta's corporate tax rate is 21%; the tax rate on interest income is 24%; and the tax rate on equity income is 20%. What will Delta's levered value be?

(3 marks)

Question 12

Lancashire Mining is considering the purchase of a new driller costing a total of £5 million pounds. This furnace will qualify for accelerated depreciation: 25% can be expensed immediately, followed by 28%, 19.2%, 11.52%, 10 % and 6.28% over the next five years.

Lancashire Mining is also considering the alternative of entering into lease contract for the driller. The lease term is five years, and the lease would qualify as a true tax lease. Lancashire's annual lease payments will be £1 million and the driller is worthless after five years.

Lancashire estimates its marginal tax rate to be only 10% over the next five years and the company currently faces an 8% borrowing rate.

REQUIRED:

i) Calculate the Lease equivalent loan and show all your calculations.

(4 marks)

ii) Advise the company if they should buy or lease. Explain how much money they would be saving if they follow your advice.

(3 marks)

Question 13

July 2020. You run a Michelin starred restaurant in Cumbria. During the lockdown period of the Covid-19 pandemic the restaurant spent several months without being able to serve drinks or food to patrons and your firm is experiencing extreme short term financial needs. You need to urgently obtain £790,000 within the next 2 weeks to cover rent, utilities and salary of employees that have been retained during the following 5 months you expect to be affected by the lockdown.

After making some phone calls, you've been able to get the following offers as sources of funding:

- Government loan of £23,000 at 0% interest rate, to be returned in 12 months.
- Cumbriabank is offering £750,000 for five months at a stated annual rate of 1.75%, using inventory (beer and vintage wine) stored in a field warehouse as collateral. The warehouse charges a £10,000 fee, payable at the end of the five months.
- LancaBank can facilitate borrowing up to £500,000 for five months at an APR of 3.5% and a loan origination fee of 0.01%.
- LondonBank offers £790,000 for five months at an APR of 2.95%. The bank will require to maintain a (no-interest) compensating balance of 10% of the face-value of the loan and will charge a 0.1% loan origination fee.

REQUIRED:

What would be the best financial strategy that would tide you over the following 5 months? Explain your proposal and show all your calculations.

(9 marks)

Question 14

You are the CEO of a firm whose stock is currently trading at £16 per share. A large Asian Private Equity firm has approached the management and board of your firm and made a tender offer of £15.8 per share. Is this a hostile take-over? Is this a fair offer? Would you accept the offer? Explain.

(4 marks)

(Total 35 marks)

Section C

Answer **EITHER** Question 15 **OR** Question 16.

Answer all parts of the chosen question.

Question 15

a) Your research and development division has just invented a new type of screen for smartphones; you have given the go ahead to try to produce it commercially. It will take five years to find out whether the screen is commercially viable, and you estimate that the probability of its success is 22%. Development will cost £8.0 million per year, paid at the beginning of each year. If development is successful and you decide to produce the screen, a factory extension will be built immediately. The factory will cost £1,100 million to put in place and will generate profits of £80 million at the end of every year in perpetuity. Assume that the current five-year risk-free interest rate is 9.2% per year, and the yield on a perpetual risk-free bond will be 10.0%, 9.0%, 7.0%, 6.0% or 4.0% in five years. Assume that the risk-neutral probability of each possible rate is the same.

REQUIRED:

i) What is the NPV of this project today?

(5 marks)

ii) Suppose that you can sell the screen prototype to a competitor for £45 million in year 5. This option is available regardless of whether the development stage is successful or not. What is the value of this option?

(5 marks)

b) How can proxy contests be used to overcome a captured board?

(4 marks)

c) What are the advantages and disadvantages of increasing the options granted to CEOs?

(3 marks)

d) You are a Venture Capitalist that has offered £3 million in funding to a start-up operating in the sector of renewable energy (GreenAI) that has developed 3 prototypes of fast charging solar panels. GreenAI has only raised capital from the founder and one Angel Investor. At the moment, there is no reasonable valuation of equity from the market. Explain how should the VC design the financing terms to guarantee profit at the moment of the exit strategy.

(8 marks)

e) BAD Company's stock price is £35, and the firm has 10 million shares outstanding. You believe you can increase the company's value if you buy it and replace the management. Assume that BAD has a poison pill with a 25% trigger. If it is triggered, all BAD's shareholders—other than the acquirer—will be able to buy one new share in BAD for each share they own at an 80% discount. Assume that the price remains at £35 while you are acquiring your shares. If BAD's management decides to resist your buyout attempt, and you cross the 25% threshold of ownership:

REQUIRED:

i) How many new shares will be issued and at what price?

(3 marks)

ii) What will happen to your percentage ownership of BAD?

(2 marks)

iii) What will happen to the price of your shares of BAD?

(2 marks)

iv) Do you lose or gain from triggering the poison pill? If you lose, where does the loss go (who benefits)? If you gain, from where does the gain come (who loses)?

(3 marks)

(Total 35 marks)

Question 16

a) Arrow Bikes is planning to develop a new electric bike. In order for the project to be successful, the company must develop a lightweight battery, a new deck to accommodate the lightweight battery, an electric motor and a charger 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 bike:

Technology	Cost (in thousands)	Time	Probability of Success
Deck	£60	1 year	0.75
Battery	£200	3 years	0.25
Charger	£250	1 year	0.50
Motor	£300	2 years	0.50

All four risks are idiosyncratic, and the risk-free rate of interest is 5%. Arrow has estimated that, if all stages are successful, they can then develop the electric bike and start selling it. At that point in time (i.e., once all stages are completed), the present value of all future profits from selling the bike will be £10 million.

REQUIRED:

i) If Arrow does the four stages in the correct order, what is the NPV of the project?

(4 marks)

ii) If Arrow develops all four technologies simultaneously, what is the NPV of the project in this case? What is the value of the option to stage the investment?

(3 marks)

iii) Why does staging add value?

(3 marks)

b) What are some examples or symptoms agency problems that exist in a large corporation?

(3 marks)

c) Explain the process through which a board becomes captured by a CEO.

(3 marks)

d) You are advising/working for an institutional investor that has recently acquired 5% of a largely held company (Magia General). Your first job is to analyse the composition of the board of directors and propose any possible changes that the institutional investor can push using your voting rights in the next general meeting. See the following description of the board members:

- Gerald Vengerberg. Executive director and Chairman of the board. Age 51. CEO and Co-founder of the company. MBA Lancaster University (1999). Has been working over two decades as the CEO focused mostly into the commercial and production growth. Currently serves as a director at LongTransport CO.

- John Vengerberg. Age: 26. MBA Stanford. VP Amazing.com (biggest online retailer of handbags in the world. with ample experience in retail and product placement. John is Gerald Vengerberg son.

- Mark Smith. Lead Independent director. Age 74. Founder of the firm. PhD in Chemistry with extensive experience in lab innovation. Had the initial idea of a chemical component that could be adapted and created the main product of the firm in 1993. Company actually started in a home-lab in his garage. Left the management of the firm early in 2001 and has been serving in the board of Magia General for 12 years.

- Tim Jones. Executive director. Age 45. First partner of the firm. PhD Chemistry. Recruited by Mark Smith to contribute to the development of the product in the early nineties. Currently serves as a COO of Magia General Corp and is being consider to succeed the current CEO.

- Vikram Napal. Independent director. Age 75. CEO of LongTransport Co. with over 15 years of experience in Logistics and retail transport. Mr. Napal has served at the board of Magia General for 9 years.

REQUIRED:

Identify the weaknesses of the current board and propose relevant changes. Explain your reasons behind the potential problems and proposed solutions.

(9 marks)

e) MacKenzie Corporation currently has 11 million shares of stock outstanding at a price of £43 per share. The company would like to raise money and has announced a rights issue. Every existing shareholder will be sent one right per share of stock that he or she owns. The company plans to require five rights to purchase one share at a price of £43 per share.

REQUIRED:

i) Assuming the rights issue is successful, how much money will it raise?

(1 mark)

ii) What will the share price be after the rights issue? (Assume perfect capital markets).

(2 marks)

Suppose instead that the firm changes the plan so that *each* right gives the holder the right to purchase one share at £6 per share.

iii) How much money will the new plan raise?

(1 mark)

iv) What will the share price be after the rights issue?

(2 marks)

v) Which plan is better for the firm's shareholders? Which of the two is more likely to raise the full amount of capital?

(4 marks)

(Total 35 marks)

END OF PAPER