

## **CONSTRUCTION FINANCE AND RISK**

### **(21CVB112)**

Semester 2 2021-22

In-Person Exam paper

This examination is to take place in-person at a central University venue under exam conditions. The standard length of time for this paper is **2 hours**.

You will not be able to leave the exam hall for the first 30 or final 15 minutes of your exam. Your invigilator will collect your exam paper when you have finished.

#### Help during the exam

Invigilators are not able to answer queries about the content of your exam paper. Instead, please make a note of your query in your answer script to be considered during the marking process.

If you feel unwell, please raise your hand so that an invigilator can assist you.

You may use a calculator for this exam. It must comply with the University's Calculator Policy for In-Person exams, in particular that it must not be able to transmit or receive information (e.g. mobile devices and smart watches are **not** allowed).

Answer four questions in total:

Answer **TWO QUESTIONS in Section A**.

Answer **TWO QUESTIONS in Section B**.

Please use a separate answer book for each section.

All questions carry equal marks.

### **SECTION A**

(Answer **TWO QUESTIONS in Section A**)

1. a) Briefly explain the significance of the terms Force Majeure and Residual Risk to the effective management of risk in construction. [4 marks]
- b) In addition to physical security, there are other categories of risk that a construction organisation could be exposed to.
  - i) Outline any four of these risk categories. [4 marks]

Question 1 continues/...

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- ii) By using appropriate examples, discuss the importance of each of your four stated categories for the construction company.

[8 marks]

- c) The use of an **impact – probability** matrix can assist in a systematic evaluation of different risk issues that a project manager has to address.

With the aid of an annotated diagram, explain how such a matrix can help project managers to decide which risk issues to mitigate.

[9 marks]

- 2. A multi-million-pound infrastructure project is being planned in the centre of Nottingham City. The public sector sponsor (comprising the National Government and City Council) is exploring options for immediate and available capital at a reasonable cost to fund the project. The sponsor is open to any possible combination of sources of capital including multilateral development banks.

- a) As a financial advisor, propose and discuss principal sources of funding that the sponsor should consider.

[8 marks]

- b) Propose and justify measures that the sponsor can employ to establish the overall cost of capital if a mix of sources are used.

[6 marks]

- c) The Nottingham City project is estimated to cost above £500 million with expected duration spanning between 7 and 10 years and would need an appropriate financing arrangement for its execution. Your line manager has heard about a “syndicated loan” and would like to know more about it.

- i) Outline the principal advantages and disadvantages of using that option.

[6 marks]

- ii) Discuss the main steps in completing a syndicated loan.

[5 marks]

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3. a) By explaining the term Payback Period, justify its use to evaluate the viability of projects. [5 marks]
- b) Table Q3 presents the following expected cash flow streams for a proposed project.

**Table Q3**

Cash flow stream for proposed project (£x10 <sup>4</sup> )	Year
-1000	0
150	1
250	2
350	3
450	4
500	5
500	6

- i) Compute and justify the payback period for the project using free cash flows. [7 marks]
- ii) What will be the payback period if a discount rate of 8% is applied to the cashflow streams? [8 marks]
- iii) In your opinion discuss which of the two options 3bi and 3bii (cash flow without and with discounting) should be applied to evaluate the viability of a project if you are a conservative investor to make your decision. [5 marks]

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**SECTION B**  
(Answer **TWO QUESTIONS** in Section B)

4. The Nottingham Construction Limited (NCS) is a small company trading as per the Table Q4 below.

**Table Q4**

	2020 £'000	2021 £'000
Sales	<u>120</u>	<u>122</u>
Cost of sales	69	76
Salaries	15	16
Electricity	3	3
Goodwill	6	6
Other overheads	<u>2</u>	<u>2</u>
Tax	<u>8</u>	<u>5</u>
Interest	0	1
Provision	(10)	5
Cash in the bank	2	3
Long term loan	3	6
Stock	15	24
Creditors	6	8
Debtors	10	16
Shareholder funds		
Retained earnings	28	32
Offices and plant	70	68

- a) Draw up two financial statements, one to show the profit and the other to show how the assets and liabilities balance.  
[9 marks]
- b) Explain the differences between debtor days and creditor days, identifying why these are important for the company.  
[4 marks]
- c) Calculate the gross profit margin, the operating profit margin, and net profit margins for the two years and discuss the meaning of these results.  
[6 marks]
- d) Calculate the current ratio, the acid test ratio, and return on capital employed for the two years and explain the results.  
[6 marks]

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5. a) There are a number of ways of pricing projects. Describe the following and give an example as to when you would use each of them and the main issue for consideration due to Covid-19, Brexit and the Russian invasion of Ukraine.

- i) Top-Down
- ii) Bottom-Up
- iii) Front end loading estimating

[9 marks]

- b) You are a construction company, and a large national retailer wants you to tender for a warehouse. You visit the client and are asked during the meeting to give an order of costs for a warehouse. Whilst you are reluctant to do this as you want more time, you do not want to upset the client. On what basis or method identified in Part (a) would you provide the costs? What do you consider as the 4 main cost risks, especially given current inflation, and how would you try and mitigate these? 1 mark for each risk and 1 mark for the mitigation.

[5 marks]

- c) The company wants to Identify the weighted average cost of capital. From the figures below identify the WACC.

The total borrowing is £600k, with 20% on long-term borrowing at a rate of 7% per annum, shareholder fund of 70% at a dividend of 5% per annum and short-term loan of 10% at a rate of 12% per annum.

[3 marks]

- d) The company is considering outsourcing some of the offsite manufacturing. Identify four advantages and four disadvantages of outsourcing.

[8 marks]

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6. A project is being monitored using the earned value method, has a budget of £3m and is planned to complete in 12 months. The following table shows the values for BCWS and BCWP at the end of the first few weeks. The ACWP at week twenty is £1.5m. All costs relate to labour only.

Activity	Start at the beginning of week	Duration in weeks	BCWS (£K)	BCWP %complete	ACWP
A	0	4	70	100	
B	0	8	110	100	
C	5	12	300	60	
D	9	8	300	80	
E	17	12	750	40	
F	13	8	400	80	
G	25	12	600	0 (zero)	

- a) Draw an earned value diagram updated to show the position at the end of week twenty. Label your diagram as fully as possible. [7 marks]
- b) Why is it possible for values for BCWS to be available beyond the current date (assumed to be end of twenty weeks) but not values for BCWP and ACWP? [3 marks]
- c) At the end of week twenty, what are the values of the cost variance and schedule variance? Explain the meaning of these values. [4 marks]
- d) At the end of week twenty, what would you estimate the cost at completion and the likely time for completion of the project to be, making two different assumptions about future performance? The two different assumptions are that only one activity is causing an issue and that there are a number of activities that are causing issues. [5 marks]
- e) What can a project manager deduce about a project in this situation? Explain how this situation may have occurred. Suggest actions that a project manager might take to manage a project in this situation. [6 marks]