

CONSTRUCTION FINANCE AND RISK (20CVB112)

Semester 2 2020-21

(1b) Exam paper

This is a (1b) online examination, meaning you have a total of **2 hours plus an additional 30 minutes** to complete and submit this paper. The additional 30 minutes are for downloading the paper and uploading your answers when you have finished. If you have extra time or rest breaks as part of a Reasonable Adjustment, you will have further additional time as indicated on your exam timetable.

It is your responsibility to submit your work by the deadline for this examination. You must make sure you leave yourself enough time to do so.

It is also your responsibility to check that you have submitted the correct file(s).

You may handwrite and/or word process your answers, as you see fit.

Answer **FOUR** questions only. Answer **TWO** questions from **SECTION A** and **TWO** questions from Section B.

All questions carry equal marks.

SECTION A (Answer **TWO** questions)

1. a) i) Justify why a risk database is preferred to a 'risk register' for managing risk in construction.
[3 marks]
- ii) The use of an **impact – probability** matrix can assist in a systematic evaluation of different risk issues. Explain how such a matrix can help construction managers prioritise which risk issues to mitigate.
[6 marks]

Question 1 continues/...

.../question 1 continued

- b) Table Q1 presents impact – probability data compiled for a number of risk issues that a construction manager has to address.

Table Q1

Risk issue	Impact (£ 10 ³)	Probability	Risk issue	Impact (£ 10 ³)	Probability
Risk 1	2050	0.6	Risk 9	1560	0.38
Risk 2	3200	0.45	Risk 10	1420	0.35
Risk 3	2505	0.65	Risk 11	3320	0.88
Risk 4	1940	0.85	Risk 12	2804	0.97
Risk 5	2180	0.75	Risk 13	3980	0.52
Risk 6	3850	0.22	Risk 14	2245	0.18
Risk 7	1650	0.95	Risk 15	1752	0.67
Risk 8	1200	0.25	Risk 16	1250	0.20

- i) Develop an impact-probability matrix for the identified risk issues.
[10 marks]
- ii) Which risk issues present low levels of risk that could be left unmitigated?
[4 marks]
- iii) What additional information will be required to enable an effective mitigation plan to be devised for the risk issues in the high and medium range?
[2 marks]
2. A public sector department has an ambitious plan for an infrastructure development scheme involving several mega and complex projects within the next 5 years. The department, however, has inherent problems with lack of expertise in complex project management and limited availability of financial resources. The relevant Minister is very keen to get the development completed within time, within cost and to prescribed quality standards and has asked for your advice and help. Some external consultants to the department have suggested Pure Project Finance and Public Private Partnerships (PPP) as alternatives for funding the scheme.
- a) Briefly explain why the PPP alternative should be deemed a suitable solution for the scheme.
[5 marks]

Question 2 continues/...

.../question 2 continued

- b) Outline and discuss 5 key issues that would form the basis of your advice to the Minister in order to reduce the risk of PPP failure for the scheme.
[10 marks]
- c) The Minister is not clear about the difference between **corporate financing** and **pure project financing**. Describe and critically evaluate the two options of financing in terms of their suitability for the development scheme.
[10 marks]
3. a) Briefly explain the significance of the terms **NPV**, **IRR** and **discount factors** for making decisions on project selection.
[6 marks]
- b) Two projects (A and B) are projected to generate cash flows over a period of 5 years as follows:

Project A	Project B	Year
-1000	-1000	0
340	200	1
305	235	2
270	270	3
235	305	4
200	340	5

- i) Calculate the NPV for each of the projects using the discount factors 7% and 3%. Determine the IRR for Project A and Project B. (Use appropriate units and indicate the working process.)
[11 marks]
- ii) Which project is preferable based on NPV analysis for 7% and 3% discount factors?
[4 marks]
- iii) Which project, **A** or **B**, is preferable based on the IRR analysis?
[4 marks]

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SECTION B
(Answer **TWO** questions)

4. A construction company presented the financial accounts below for its 2020 reporting year.

	2019 £m	2020 £m
P&L Account		
Sales	<u>300</u>	<u>280</u>
Cost of sales	250	252
Gross profit	<u>50</u>	<u>28</u>
Administration and expenses	<u>26</u>	<u>22</u>
Operating profit	24	6
Exceptional items	0	2
Interest	1	2
Profit before tax	23	2
Tax	6	0
Net profit	17	2

Balance Sheet		
Current Asset		
Cash in the bank	10	6
Debtors	74	70
Stock	30	20
Non-Current assets		
Offices and plant	70	70
Goodwill	5	5
Current liabilities		
Creditors	50	40
Bank overdraft	4	2
Noncurrent liabilities		
Long term loan	4	6
Provision	0	2
Net assets		
Equity		
Shareholder funds	91	79
Retained earnings		
10 million £1 shares		

Question 4 continues/...

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- a) Calculate the net assets and the retained earnings for both years.
[2 marks]
 - b) Calculate the gross profit margin, the operating profit margin and net profit margins and discuss the possible reasons for the differences between the results for the two years considered.
[9 marks]
 - c) Calculate the debtor days and creditor days and explain the relevance of these figures.
[4 marks]
 - d) Calculate the current ratio, the acid test ratio, balance sheet gearing ratio and explain the results.
[6 marks]
 - e) Determine if the shareholders were paid a dividend in 2020 and give your reasons. Identify two reasons why a company may pay dividends even if the company made a loss in the trading year.
[4 marks]
5. A medium sized building company is looking to expand and grow the business but is not sure in which direction to go. The options considered are to merge with a similar sized company that has different expertise, which would allow entry into new markets or the acquisition of a smaller company that has similar expertise allowing for expansion in the market it is presently trading in. In either case, the company will be classed as a new company. To develop the business the company needs to borrow money to obtain new premises, to advertise and to install a computerised costing and project management system.
- a) Explain the advantages and disadvantages of merging with another company.
[8 marks]
 - b) Use Porter's five forces diagram to explain how competition can be reduced by acquiring another company.
[9 marks]
 - c) Explain how economies of scale could be achieved and what could cause diseconomies of scale. Provide a diagram to show short-term and long-term economies of scale.
[8 marks]

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6. A project is being monitored using the earned value method. The project has a budget of £70m and is planned to complete in 60 weeks. It is about mid-way through the project (32 weeks) and the project board are to re-assess this project. Table Q6 shows the values for BCWS and BCWP at the end of the first few weeks. The ACWP at week thirty-two is £37m.

Table Q6

Activity	Start at the beginning of week	Duration in weeks	BCWS (m)	BCWP % complete	ACWP
A	0	8	2	100	
B	0	12	6	100	
C	8	12	6	100	
D	12	16	16	100	
E	20	12	3	60	
F	22	8	4	50	
G	20	12	3	10	

- a) Draw an earned value diagram updated to show the position at the end of week thirty-two. Provide full annotation for your diagram. [9 marks]
- b) At the end of week thirty-two what are the values of the cost variance and schedule variance? Explain the meaning of these values. [6 marks]
- c) At the end of week thirty-two 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? [6 marks]
- d) What can a project board deduce about a project in this situation? Explain how this situation may have occurred. Suggest actions that a project board might take to manage a project in this situation. [4 marks]

F T Edum-Fotwe
M Sohail Khan
G Dickens