Loughborough University

Management of Design and Construction

23CVB103

Semester 2 2024 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 **not** use a calculator for this exam.

Section A, question 1 is compulsory – you MUST answer this question.

Answer **TWO** questions from Section B.

All questions carry equal marks.

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SECTION A
(Answer **THIS** question)

1. a) Explain the three main reasons why we try to prevent accidents.

[9 marks]

b) Discuss the five steps to Risk Assessment

[5 marks]

c) Outline the General Principles of Prevention as specified in Schedule 1 of The Management of Health and Safety at Work Regulations 1999.

[9 marks]

d) Create a Risk Assessment matrix and populate it for a simple trench excavation and discuss the mitigating actions that may arise.

[11 marks]

SECTION B
(Answer **TWO** questions)

2. a) Explain the difference between analysis and synthesis when deployed as part of a design problem solving process.

[8 marks]

b) An engineer examines an initial design problem statement using analysis and synthesis. Identify the three possible logical outcomes of this examination. For each, comment on the consequences of the insight gained.

[12 marks]

c) Explain the relationship between the value engineering Job Plan and the Design Council's Double Diamond design process. Illustrate your explanation with a suitable diagram.

[13 marks]

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3. a) Explain the role of the facilitator in a value management workshop.

[8 marks]

b) Explain the role of sensemaking in a value management workshop.

[5 marks]

c) Explain the role of satisficing in a value management workshop.

[5 marks]

d) Use the principles of function analysis to identify the functions being performed by the chair you are currently sitting on. Your answer should comprise a list of ten functions, expressed appropriately.

[10 marks]

e) A value engineering facilitator leads the workshop participants through the process of completing a FAST diagram. After working hard to produce the diagram, the facilitator destroys it in front of the workshop participants. Why might the facilitator do this?

[5 marks]

4. a) Inspection of tender documents is a vital step before the contractor makes a final decision to tender. Analyse the main aspects which the estimating team should explore within the tender documents before making the decision to tender demonstrating the impact which these aspects could make on the estimate.

[16 marks]

b) Deciding on the method statement of the project has a significant influence on managing the cost of temporary works. Discuss the importance of the method statement in construction projects and the factors which the contractor should consider when deciding on the method statement for a construction project.

[17 marks]

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5. a) The UK Civil Engineering sector faces a number of challenges. Identify and discuss **three** of these challenges. Explain how each of the two reports: National Infrastructure Strategy (2020) and The National Infrastructure and Construction Pipeline (2021) try to address these challenges.

[8 marks]

b) There are two key milestones for a contractor must complete in a competitive tender process. Explain what these milestones are and discuss **three** examples of planning activities that need to be undertaken leading up to each milestone.

[8 marks]

c) Write brief notes explaining the following programming techniques:

- Linked bar charts;
- Precedence diagrams; and
- Time chainage diagrams.

Explain the types of projects each technique is best suited for.

[9 marks]

d) A joint venture partnership on a complex infrastructure project is keen to adopt Collaborative Planning. Explain what Collaborative Planning is, how it works and its relationship to a typical construction programme. Discuss how 4D Planning could play a role in Collaborative Planning.

[8 marks]

J Mackenzie

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