

## **Management of Construction Processes and Techniques**

### **22CVP326**

Semester 2 2023

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 **3 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 **THREE** questions.

Answer **ONE** question from each of the **Sections A, B and C**.

Please use a separate answer book for each section.

All questions carry equal marks.

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### SECTION A

(Answer **ONE** question from this section)

1. a) Describe (with a supporting diagram) the main elements of the 'Gartner Hype Cycle'.  
[9 marks]
- b) Discuss the current status and progress over time, the adoption of TWO construction innovations using the Hype Cycle.  
[8 marks]
- c) Provide an outline of each of the key activities that make up the innovation process in organisations.  
[16 marks]
2. a) Describe the Risk Management process and its main purpose.  
[8 marks]
- b) Risk categories are groupings of potential causes of risk. List the main risk categories.  
[5 marks]
- c) Discuss THREE of the risk categories identified with at least one example.  
[12 marks]
- d) Discuss the current status of managing risk in construction, and how it could be improved.  
[8 marks]

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## SECTION B

(Answer **ONE** question from this section)

3. a) Using examples from mega projects (such as Crossrail), identify and describe **FOUR** sources of project complexity. [8 marks]
- b) Modern construction projects are increasingly more complex. Discuss how Soft Systems Methodology (SSM) can positively contribute to the management of complex construction projects. [11 marks]
- c) Identify and describe **FOUR** key lessons learnt from the management of the Crossrail mega project. [8 marks]
- d) Despite their potential benefits, Construction Consolidation Centres have not been widely implemented across the industry in the UK. Identify and critically discuss **THREE** most important challenges that affect the implementation of Construction Consolidation Centres. [6 marks]
4. Complex projects present particular challenges for construction teams and innovative digital technologies have potential to address such challenges.
- a) HS2 started the construction of new tunnels between London and Crewe with a total length of 103km. Among them, the Chiltern Tunnel will be 16km long with depths up to 90 meters. Your team is working as the digital technology consultant for this project. Considering characteristics/risks of the project, propose **THREE** different digital technologies that could be employed for improving construction of the project, critically discuss why each technology is appropriate and their applications, evaluate expected benefits and challenges. [18 marks]
- b) Critically describe the key elements of business models. [6 marks]
- c) The implementation of BIM may bring a new business model of innovation for construction firms. Apply key elements of business model (described in Question 4b) to explain a new business model with BIM, for a construction firm. [9 marks]

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### SECTION C

(Answer **ONE** question from this section)

5. a) Compare and contrast some of the advantages and disadvantages of an MMC (modern method of construction) approach to construction. How might the challenges for the housing sector be different to the energy/oil/petrochem sector? [15 marks]
- b) Choose THREE different examples of recent innovative MMC examples in the UK construction sector, explaining for each of them:
- i) What they are;
  - ii) Why they are being used; and
  - iii) Their advantages and limitations.
- [18 marks]
6. Offsite techniques are commonly promoted in the construction press and emphasised in Government reports.
- a) Provide a reasoned argument, with examples, to answer the question: "Is offsite innovation?" [8 marks]
- b) Discuss whether this is now the time where offsite construction really 'takes off' in the UK. [6 marks]
- c) Compare and contrast how the different levels of offsite affect the design and construction process, with an example for each level. [11 marks]
- d) Describe how Brexit and the war in Ukraine has affected the take up of offsite construction in the UK and Europe. [8 marks]

R Soetanto  
F Edum-Fotwe  
C Goodier  
M Wang