ENGINEERING TRIPOS PART IIB
ENGINEERING TRIPOS PART IIA

TUESDAY 10 May 2011 2.30 to 4

Module 4D16

CONSTRUCTION AND MANAGEMENT

*Answer not more than **three** questions.*

All questions carry the same number of marks.

*The **approximate** percentage of marks allocated to each part of a question is indicated in the right margin.*

There are no attachments.

STATIONERY REQUIREMENTS
Single-sided script paper

SPECIAL REQUIREMENTS
Engineering Data Book
CUED approved calculator allowed

You may not start to read the questions printed on the subsequent pages of this question paper until instructed that you may do so by the Invigilator

1 (a) List the main design stages for a substantial building and describe what the output documentation might include. [35%]

(b) Ideally, at the completion of each stage, a decision is reached on the scope of the design for the next stage. Who are the main parties in the decision process? What criteria would be taken into account? [30%]

(c) Describe how the engineer can assist in the decision making process. How can good or bad design decisions be identified? [35%]

2 (a) List and discuss four benefits of using structural steelwork in commercial building projects. [30%]

(b) For projects that involve complex structural steelwork, discuss the benefits of early contractor involvement. [30%]

(c) Complex structural steelwork and early contractor involvement are common in large stadium construction projects. Briefly discuss aspects of either the Arsenal Emirates Stadium or the East London Olympics Stadium in relation to those two issues. [40%]

3 (a) Discuss current challenges of the design and construction of nuclear power plants in the UK. [40%]

(b) Compare and contrast the following forms of contract:

(i) Traditional;

(ii) Construction management;

(iii) Design and build. [60%]

4 Risk management in construction ensures that thought is given to what could go wrong, that uncertainty is measured in order to manage it, and that project estimates are realistic.

(a) What are typical sources of risk in Construction? [20%]

(b) Sketch a diagram to show how risk and impact of risk vary over the various stages of the life cycle of a project, describing salient points. [20%]

(c) What is a risk register and what purpose does it serve? [20%]

(d) Explain how risk is evaluated. [20%]

(e) Explain how risk is mitigated. [20%]

5 Professional Indemnity Insurance (PII) for engineers is a form of liability insurance which protects against "the financial consequences of professional negligence following a breach of professional duty by the way of neglect error or omission". In addition it provides an indemnity in respect of the legal costs, and other costs and expenses incurred in the defence of any claim.

(a) What does PII cover? [20%]

(b) What are the ramifications of the nature of PII? [20%]

(c) List eight claims commonly made against engineers. [20%]

(d) What are the methods of resolution of a claim? [20%]

(e) What are the steps that can be taken by engineers to prevent the incidence of claims and to minimise or reduce their cost? [20%]

END OF PAPER