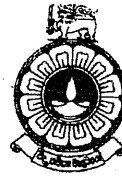


THE OPEN UNIVERSITY OF SRI LANKA
Diploma in Technology (Civil) - Level 4
CEX 4235 - Building Engineering



FINAL EXAMINATION - 2008/09

Date: 01-04-2009 (Wednesday)

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Time Allowed: 3 hours

Time: 0930 - 1230 hrs

The paper consists of 7 questions. Answer any FIVE (5) questions.

Q1.

Suppose that you are the 'Design Team Leader' of a multi-storey shopping complex project.

- What do you understand by the term 'project'. Briefly explain. (5 marks)
- As the 'Design Team Leader', what is your role in the project. (5 marks)
- List down other members in the Design Team. (5 marks)
- Explain inter-dependency of cost, time and quality of a project using your own examples. (5 marks)

Q2.

- Briefly explain what you understand by the feasibility of a project. (5 marks)
- Describe how the topography of a site could significantly influence architectural design of a building. (5 marks)
- List down the sub-stages of the 'Design Stage' of a building project, and write down the objectives of each sub-stage. (5 marks)
- There are four clearly defined steps in the preparation of Bills of Quantities. List and describe them. (5 marks)

Q3

- Describe different ways that walls may get damp, and explain the precautions to be taken to prevent them. (5 marks)
- Sketch a cross section of an asbestos roof and indicate its members. Also describe the functions of each of the members indicated in the diagram. (5 marks)
- clearly sketch two successive courses of a right angle (L) quoin of a 'one-brick' wall. (5 marks)
- Compare the advantages and disadvantages of load bearing wall system and rigid-frame system? (5 marks)

Q4

- List down sanitary appliances used in an attached-toilet/bathroom for a modern apartment. (3 marks)
- Sketch the arrangement of selected appliances in the toilet/bathroom and describe the factors to be considered in designing the arrangement of appliances. (7 marks)
- Define the 'trap seal' used in sewerage systems and describe how the water in the trap seal can be lost. (5 marks)
- State the purpose of using 'vent pipe' with sewerage pipe systems. (5 marks)

Q5

- (a). State four functional activities used in solid waste management system. (4 marks)
- (b). Discuss the methods used in on-site handling of solid waste in high-rise apartments. (6 marks)
- (c). Discuss the factors that should be considered in selecting a location for an on-site storage of domestic solid waste. (5 marks)
- (d). Discuss advantages and disadvantages of 'sanitary land filling' used in disposal of solid waste. (5 marks)

Q6.

- (a) Discuss the **advantages** as well as **disadvantages** of three-phase alternating current supply when compared with a single-phase alternating current supply. (5 marks)
- (b) Enumerate the seven parts of the IEE Wiring Regulations - 16th Edition. (5 marks)
- (c) Write down a short description of Miniature Circuit Breakers (MCBs) with specific reference to following;
 - (i) Protection offered by a MCB to a circuit
 - (ii) Types of MCBs available for different applications
 - (iii) Operating principle of commonly available MCBs (5 marks)
- (d) Discuss Residual Current Circuit Breakers (RCCBs) under following headings;
 - (i) Operating principle of commonly available RCCBs
 - (ii) With reference to 'Time-Current zones of effect' on humans the protection offered by a RCCB to users
 - (iii) Other safety features incorporated in a RCCB to offer safety and protection to the installation supplied by it. (5 marks)

Q7.

- (a) Describe the following quantities for a lighting source;
 - (i) Luminous Intensity
 - (ii) Luminous Efficacy
 - (iii) Glare Index (6 marks)
- (b) Based on the technical characteristics of electric lighting devices, they can be categorized in to three areas. Write descriptive notes on these three types of lighting devices specifically indicating the principle of illumination and lighting efficacy. (6 marks)
- (c) Describe the parameters of the following equation representing the Lumen method of lighting design.

$$N = (E \times A) / (F \times U \times M)$$

A garment factory area 16 m long by 5 m wide requires an illumination level of 600 lux on the working plane. It is proposed to use 120 W fluorescent light fittings, having a rated output of 15,000 lumens each. Assuming a utilization factor of 0.80 at the working plane and a maintenance factor of 0.70 evaluate the total number of fittings required and on a sketch show a layout for them. (8 marks)