THE OPEN UNIVERSITY OF SRI LANKA
Department of Civil Engineering
Diploma In Technology (Civil) - Level 4

CEX 4235 – Building Engineering

FINAL EXAMINATION - 2007

Time Allowed: Three (03) Hours

Date: 2008 - 05 – 16 (Friday) Time: 0930 - 1230 hrs.

Answer Five (05) out of Seven (07) questions.

Q1.

(a) What are the advantages and disadvantages of load bearing wall system and rigid-frame system? (04 marks)

(b) Clearly sketch two successive courses of the following:
(i). Tee (T) junction between a 'half-brick' wall and a 'one-brick' wall. (03 marks)
(ii). Right Angle (L) Quoin of a 'one-brick' wall (03 marks)

(c) Sketch a rubble masonry foundation including damp proofing details for a 225 mm brick wall of a two storeyed house to be constructed on a land where ground condition is fairly good. (05 marks)

(d) Sketch a cross section of an asbestos roof indicating its members. (05 marks)

Q2.

(a) Explain the importance of preparing a client's brief, discussing the key aspects of it. (05 marks)
(b) Explain the interdependency of cost, time, and quality of a project with the help of examples (05 marks)
(c) Explain using examples, what is meant by Primary Circulation, Secondary Circulation, and Domain. (05 marks)
(d) List down the sub-stages of 'Design Stage' and write down the objectives of each sub-stage. (05 marks)

Q3.

(a) Describe the primary functions of a Quantity Surveyor? (05 marks)

(b) Explain the importance of using the 'Standard Method of Measurement' in preparing the Bill of Quantities for construction work. (05 marks)

(c) There are four clearly defined steps in the preparation of Bills of Quantities. Describe them. (05 marks)

(d) Explain what you understand by 'Specifications' and give examples for specifications for architectural and structural work. (05 marks)

Q4.

(a) Describe the considerations taken into account in selecting a site for a water intake. (05 marks)
(b). Compare and contrast Branched and Grid Systems of water distribution. (05 marks)
(c). Describe **four** treatment processes applied in water purification. (05 marks)
(d). Describe the process that takes place in a slow sand filter. (05 marks)

Q5.

(a). Sketch a conventional septic tank and name its parts. (05 marks)

(b) What are the considerations taken into account in designing septic tanks. (05 marks)

(c). Describe the factors to be considered in onsite storage of solid waste. (05 marks)

(d). Describe the principal methods of waste disposal. (05 marks)

Q6.

(a) The type of transmission system used in an electricity supply is primarily responsible for **safety and shock protection**. Describe your understanding of the system used in Sri Lanka in achieving the above objectives. (You may use sketches to support your answer.) (06 marks)

(b) Clearly describe your understanding of **'Power Factor'** applicable to alternating current supplies, indicating typical power factors of different types of installations (e.g. Domestic, Industrial). (06 marks)

(c) Legislations pertaining to electricity usage in Sri Lanka stipulate the regulations of Institution of Electrical Engineers of United Kingdom (IEE) be adopted. In this context briefly discuss the seven parts of the IEE Wiring Regulations – 16th Edition. (08 marks)

Q7.

(a) Define the following quantities with respect to light and lighting;

i.) Luminous Intensity
ii.) Luminous Flux
iii.) Illuminance
iv.) Luminous Efficacy
v.) Glare Index

(06 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. (06 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 Laboratory 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 florescent light fittings (Three, 40 W lamps in one reflector type fitting), 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 a layout for them. (08 marks)