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

CEX4235 - Building Engineering

FINAL EXAMINATION - 2015/2016

Time Allowed: Three (03) Hours

Date: 09-12-2016 (Friday) Time: 0930 - 1230 hrs.

Answer any five (5) out of seven (7) questions.

Q1.

(a). Identify **three** members of the project team required by a client to implement a multi storied apartment complex and briefly describe **two** duties each of each member. (5 marks)

(b). List and briefly describe the **four sub stages** of the "design stage" of building projects. (5 marks)

(c). It is possible to classify buildings in several ways based on different criteria. Give **three** such criteria stating **two** examples for each. (5 marks)

(d). Define what you understand by the following words;
Served space, service space, useable space and circulation space (5 marks)

Q2.

(a). Discuss **two** problems associated with projects initiated by a **"non user plural client"** giving an example for such a client. (5 marks)

(b). Explain how the **topography** of a site could significantly influence **architectural design** of a building giving examples. (5 marks)

(c). In Sri Lanka, as in most countries of the civilized world, buildings cannot be built in a haphazard manner. There are laws which discipline building activity. State **four** reasons why building laws are necessary. (5 marks)

(d). Explain the importance of using the **"Standard Method of Measurement"** in preparing the Bill of Quantities for construction work. (5 marks)

Q3.

(a). Demonstrate the use of the **dimension paper** with respect to taking off quantities for eight 3.0m high reinforced concrete columns 250 x 300mm in size in the ground floor of a building. Limit your exercise to the items 'formwork' and 'reinforced concrete' only. (5 marks)

(b). **"Bills of Quantities"** are used throughout a building project by different parties involved. State **four** important uses of Bills of Quantities.. (5 marks)

(c). Why is a water system under pressure essential? State **two** reasons. (5 marks)

(d). State **two** advantages and disadvantages each of **chlorine** and **ozone** as a **"disinfectant"** used in purification of water. (5 marks)

Q4.

(a). Compare and contrast "between **slow sand filters**" with "**rapid sand filters**". (5 marks)

(b). State **two** advantages and disadvantages each of "**branched**" and "**grid**" systems of water distribution. (5 marks)

(c). Explain what is meant by the "**loading unit**" used in assessing probable demand of water in a building. (5 marks)

(d). State the purpose of using a "**vent pipe**" with sewerage pipe systems. (5 marks)

Q5.

(a). Explain the purpose of **manholes** and describe the **locations** at which they should be provided. (5 marks)

(b). What are the factors taken in to account in determining the **capacity** of septic tanks? (5 marks)

(c). Clearly sketch **plans of two successive courses** of a "one brick" right angled quoin in "English" bond. (5 marks)

(d). Explain why a **foundation** is necessary for a building. Draw sketches of an **elevation** and a **plan** of a reinforced concrete "**pad footing**". (5 marks)

Q6.

(a). State **one** advantage of a **hip roof** over a **double pitched roof**. Sketch a plan of a timber **hip roof** indicating three important members. (5 marks)

(b). Draw a sketch of a **single phase AC generator** and label important parts. (5 marks)

(c). Explain "**Power Factor**" of alternating current electrical installations, using diagrams where necessary. (5 marks)

(d). Miniature Circuit Breakers (MCB) provide protection against **two** types of "**over currents**". Name and briefly describe those. (5 marks)

Q7.

(a). Describe **two** reasons for dividing domestic electrical installations into sub circuits. (5 marks)

(b). What is the operational principle of a Residual Current Circuit Breaker (RCCB)? Explain with a neat sketch. (5 marks)

(c). Explain what you understand by the term "**Polar Curve**" with a neat sketch. (5 marks)

(d). Briefly explain how a room air conditioner works with a simple sketch. (5 marks)