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

CEX4235 - Building Engineering

FINAL EXAMINATION - 2014/2015

Time Allowed: **Three (03) Hours**

Date: 10-09-2015 (Thursday) Time: 0930 - 1230 hrs.

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

Q1.

(a). The Client of a building project would prefer to achieve certain **objectives**. List and briefly describe **three** main objectives to be fulfilled for the success of a building project. (5 marks)

(b). A building project is implemented to fulfil a need. What is needed is stated in the client's brief. To be effective the **need** has to be properly **defined**. Assuming that you require a house built, discuss **five** requirements you would include in your client's brief. (5 marks)

(c). "**Outline design stage**" is a very important stage in a building project. Discuss why it is very important. (5 marks)

(d). A building is made up of several **primary elements**. List and briefly discuss **four** such elements. (5 marks)

Q2.

(a). Give examples of **four** different places / rooms of a hospital ranking them according to hierarchy with respect to privacy from **least private** to **very private** . (5 marks)

(b). Explain what you understand by the **feasibility** of a project. Feasibility of a project should be evaluated with respect to **three** different aspects. List and briefly describe those aspects. (5 marks)

(c). "**Orientation of the site**" is an important **criteria** when selecting a site for building construction. Explain why it is important and illustrate with neat sketches. (5 marks)

(d). Regulatory approval need to be obtained before commencement of construction of any building. There are several organizations enacting **building laws** depending on the location of the proposed building. Name **five** such organizations. (5 marks)

Q3.

(a). Demonstrate the use of the "**dimension paper**" with respect to taking off quantities for ten 3.0m high reinforced concrete columns 225 x 225mm in size in the ground floor of a building. **Limit** your exercise to the items "formwork" and "reinforced concrete" only. (5 marks)

(b). A suitable water supply system should satisfy certain requirements. State **three** such requirements. (5 marks)

(c). "Chemical treatment typically is applied prior to **sedimentation** and **filtration** to enhance the ability of a treatment process to remove particles". List two types of **chemicals** used for this purpose and describe the function of each. (5 marks)

(d). **Ozone** and **Chlorine** are two different types of chemical disinfectants used in water purification. National Water Supply & Drainage Board uses **Chlorine** for this purpose in their purification plants. Justify this selection by giving **three** reasons and state one disadvantage of chlorine. (5 marks)

Q4.

(a). State **two** advantages and disadvantages each of gravity system used for water distribution. (5 marks)

(b). Describe **two** different methods used to supply water to tall buildings. (5 marks)

(c). "The **effluent** from a **septic tank** is generally disposed into a soakage pit when the soil is sufficiently permeable". Draw a sketch of a typical **soakage pit**. (5 marks)

(d). State and briefly describe the **four** functional elements used in a solid waste management system. (5 marks)

Q5.

(a). Draw clearly **plans** of **two successive courses** of a "one brick wall" in "English Bond" and "Flemish Bond". (5 marks)

(b). Draw a **cross section** of a strip foundation for a two storied building founded in poor ground conditions liable for unequal settlements. (5 marks)

(c). Explain with relevant sketches the functions of following members of a **roof**: purlin, rafter and wall plate. (5 marks)

(d). **Valance board** serves several purposes. List **three** reasons for providing valance boards. (5 marks)

Q6.

(a). Explain the concept of "Root Mean Square - R.M.S." used in measurement of AC currents and voltages. (5 marks)

(b). Draw a schematic diagram of a house wiring circuit, indicating all necessary switch-gear and components starting from the main power supply post, for the two sub circuits with the following requirement. (5 marks)

(i). Sub circuit 1 - one 13A wall outlet

(ii). Sub circuit 2 - two lighting points and two fans

(c). Show **graphically** the operating characteristics of **four** types of **MCB's** used in over current protection and identify giving **reasons** what type is more suitable for domestic electrical installations. (5 marks)

(d). Discuss the difference between an "**overload**" and "**short circuit**" current. (5 marks)

Q7.

(a). **Omission** of overload protective devices are **permitted** under certain circumstances. Describe **two** such cases. (5 marks)

(b). Describe the following quantities for a **lighting source**; (i) Luminous intensity (ii) Glare Index. (5 marks)

(c). Write a **short note** on Compact Fluorescent Lights **(CFL)** as an energy saving luminary. Include **two advantages** and **two disadvantages** each of CFL bulbs over other conventional types. (5 marks)

(d). Draw a **psychrometric chart** for moist air and indicate how you would represent the processes of **heating, cooling, humidification** and **dehumidification**. (5 marks)