The Open University of Sri Lanka
Faculty of Engineering Technology
Department of Civil Engineering

Study Programme	: Bachelor of Technology Honours in Engineering
Name of the Examination	: Final Examination
Course Code and Title	**: CVX4349/ CVX4535/ CEX4235 Building Engineering**
Academic Year	: 2019/2020
Date	: 11th August 2020
Time	: 1330-1630hrs
Duration	: **3 hours**

General Instructions

1. Read all instructions carefully before answering the questions.
2. This question paper consists of **Seven (7)** questions in **Three (3)** pages.
3. Answer any **Five (5)** questions only. All questions carry equal marks.
4. Answer for each question should commence from a new page.
5. This is a Closed Book Test (**CBT**).
6. Answers should be in clear hand writing.
7. Do not use Red colour pen.

Q1.

(a) What is a project? Briefly explain three main characteristics of a project? (5 marks)

(b) The time, cost and quality considerations of a project are interdependent and usually refers as triple constraints. Discuss this Scenario giving examples. (5 marks)

(c) If you are assigned as a project manager of a mega construction project like new Kelani Bridge, what would be your main roles and responsibilities? (5 marks)

(d) Almost all clients expect to get "Cost Effective Solutions" for their requirements from their designers, consultants and contractors. Explain this scenario using "lifecycle Cost" approach. (5 marks)

Q2.

(a) What is foundation in construction? What are its main functions and requirements? What are the main types of foundations? Briefly describe in your words. (5 marks)

(b) **Spatial hierarchy** is a significant criterion for understanding the interrelation of **spaces**. Briefly describe types of spaces used in a building giving examples. (5 marks)

(c) Selection of a suitable site for a building project is utmost important and the total cost of the project will heavily depend on this. List four criteria of selecting a suitable site and describe one of them in detail. (5 marks)

(d) What is the main function of a load bearing wall? List an advantage and a disadvantage of load bearing walls. what are other functions of any types of walls (load bearing or non-load bearing)? (5 marks)

Q3.

(a) Explain treatment methods applied during water purification process, giving purpose of each method. (5 marks)

(b) Rapid sand filters (RSF) provide rapid and efficient removal of relatively large suspended particles. Sketch a rapid sand filter and name important parts. (5 marks)

(c) Explain the Coagulation and Flocculation in a water treatment plant during the water purification process. (5 marks)

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

Q4.

(a) Strength of brick wall depends on several factors. Name and briefly describe **three** such factors. (5 marks)

(b) Types of bonds in brick masonry wall construction are classified based on laying and bonding style of bricks in walls. Briefly describe **English bond, Flemish bond and Stretcher bond** in masonry works with illustrations. (5 marks)

(c) Flooring is the general term for a permanent covering of a floor, or for the work of installing such a floor covering. Compare two types of floor finishes considering economy, durability, and maintenance advantages of them. (5 marks)

(d) Name three types of roofs, most commonly used in Sri Lanka. Draw a sketch of a Double Pitch Roof (or Gable Roof) naming important components. (5 marks)

Q5.

(a) The plumbing in any building serves two main purposes. The first is to **bring water** into the structure for human use, and the second is to **remove wastewater** of various types. What are the similarities and differences of these two systems? (5 marks)

(b) Draw a clear sketch of a septic tank (cross section) giving rough length proportions and naming important parts. (5 marks)

(c) Briefly describe "Hydraulic Retention Time" (or effluent retention time) of a septic tank, and explain the importance of this concept? (5 marks)

(d) Sri Lanka generates 7000MT of solid waste per day. For the last 20 years or so, government institutions have attempted to figure out the best waste management strategy for the country. Describe two methods of disposal of solid waste giving advantages and disadvantages, and their applicability to Sri Lanka. (5 marks)

Q6.

(a) Describe the difference between Alternating Current (AC) and Direct Current (DC) giving two advantages of each. (5 marks)

(b) Motors and generators are electromagnetic devices. They have current-carrying loops that rotate in magnetic fields. Describe the differences between mortar and generator considering main principle of working and function. (5 marks)

(c) Explain the concept of 'Root Mean Square – R.M.S.' used in measurement of AC currents and voltages showing peak value and RMS value in a diagram. (5 marks)

(d) Describe the difference between Overload Current and Short Circuit Current. Which one is more dangerous? (5 marks)

Q7.

(a) Briefly describe the operational principal of a Residual Current Circuit Breaker (RCCB) with a clear sketch. (5 marks)

(b) Contrast and compare advantage(s) and disadvantage(s) of Incandescent light bulb, CFL bulbs and LED bulbs. (5 marks)

(c) Briefly explain the air-conditioning (often refers to as AC) process. (5 marks)

(d) Briefly describe properties of air can be shown in a psychometric chart. (5 marks)