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**
	Building Engineering
Academic Year	: 2022/2023
Date	: 13th February 2024
Time	: 0930-1230hrs
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? What are the main characteristics of a project? Briefly explain three of them. (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 role? (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 are the four main implementation stages of building projects? Briefly explain Design Stage explaining its sub stages. (5 marks)

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

(c) 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)

(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) Briefly explain differences between Rapid Sand Filters and Slow Sand Filters in their function, efficiency and cleaning process. (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 of "branched" and "grid" systems of water distribution. (5 marks)

Q4.

(a) What are the main requirements to be satisfied by sanitary fixtures and connections used in a building? (5 marks)

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

(c) 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)

(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 elements. (5 marks)

Q5.

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

(b) 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)

(c) Draw a simple circuit diagram showing main switch, trip switch (RCCB), Breakers (MCB), 3 bulbs with switches and 2 plugs, showing clearly how live, neutral and earth wires are connected to each element. (5 marks)

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

Q6.

(a) 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)

(b) 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)

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

(d) The general practice of configurations of Three-Phase Supply Systems is to connect output wires in either of two configurations termed 'star' or 'delta'. Draw diagrams of these two systems naming important elements. (5 marks)

Q7.

(a) Contrast and compare advantage(s) and disadvantage(s) of CFL bulbs and LED bulbs. (5 marks)

(b) What is the transformer? Explain the function of it with a neat diagram showing relationship among input voltage (V1), output voltages (V2), primary winding (N1) and secondary winding (N2). (5 marks)

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

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