00118

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	: 2020/2021
Date	: 3rd February 2022
Time	: 1400-1700hrs
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) Briefly explain why Project Management is important for successful completion of any construction project? (5 marks)

(b) What are the three types of project constraints? Discuss 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 are the main functions and requirements of a foundation? What are the main types of foundations? (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) How do you distinguish **Load bearing walls** and **non-load bearing walls**? List two advantages and disadvantages of load bearing walls? (5 marks)

Q3.

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

(b) What are the basic differences between slow sand filters and rapid sand filters? (5 marks)

(c) Coagulation and flocculation are used to separate the suspended solids portion from the water. Briefly explain this process. (5 marks)

(d) There are basically two types of distribution system; Branched system and Looped network system (or grid system). Distinguish two systems giving two advantages and two disadvantages of each. (5 marks)

Q4.

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

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

(c) 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)

(d) Country-wide 95 % of households contain their toilet waste near its origin in below-ground storage tanks. Discuss issues and challenges of such a system. (5 marks)

Q6.

(a) Describe why Alternating Current (AC) is widely used instead of Direct Current (DC) for most of the applications. (5 marks)

(b) The concept of Root Mean Square (rms) is used to represent the magnitudes in alternating current supplies, such as voltage, current, and power. Explain this concept 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) 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)

Q7.

(a) 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)

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

(c) Contrast and compare giving two advantages and two disadvantages of Incandescent light bulbs, CFL bulbs and LED bulbs. (5 marks)

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