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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	: 2021/2022
Date	: 13th February 2023
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 are the three types of project constraints? Discuss giving examples. (5 marks)

(b) List and briefly describe the four sub stages of the "design stage" of building projects. (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) Define what you understand by the following words; Served space, service space, useable space and circulation space. (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 each of load bearing walls? (5 marks)

Q3.

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

(b) Sketch a rapid sand filter and name important parts. (5 marks)

(c) Briefly explain the water demand in Sri Lanka showing peak demand hours in a sketch of daily water demand pattern. (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) 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)

(b) 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)

(c) 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)

(d) Illustrate with a sketch a rainwater pipe system with various fittings used to drain water collected at the eaves of a roof. (5 marks)

Q5.

(a) Describe what a septic tank is. Sketch a sectional view of a typical septic tank used in a domestic sewerage disposal system and name its 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) Compare and contrast the three main systems used to transmit electrical power. (5 marks)

(c) Briefly explain why Short Circuit Current is more dangerous than Overload Current. (5 marks)

(d) Draw a sketch of a single phase AC generator and label important parts. (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) Explain what you understand by the term "Polar Curve" with a neat 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 with a simple sketch how a room air conditioner works. (5 marks)