

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	: 2023/2024
Date	: Saturday, 15 th March 2025
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 **Four (4)** 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.
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Q1.

- (a) What are the objectives of a successful project? (5 marks)
- (b) Briefly explain triple constraints of a project 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) Briefly explain stages in Project cycle with help of a neat sketch. (5 marks)
- (b) What are main functions and requirements of a foundation? What are the main types of foundations? (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) 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) What are the main factors that should be considered when analyzing of the client requirement of a project? (5 marks)
- (b) Explain treatment methods applied during water purification process, giving purpose of each method. (5 marks)
- (c) Briefly explain differences between Rapid sand filters (RSF) and Slow Sand Filters (SSF) in their function, efficiency and cleaning process. (5 marks)
- (d) State two advantages and two disadvantages 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) Draw a clear sketch of a Septic Tank (cross section) giving rough length proportions and naming important parts. (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)

Q5.

- (a) Draw a simple circuit diagram showing main switch (Isolator), trip switch (RCD - Residual Current Device), Circuit Breakers (MCB), 3 bulbs with switches and 2 plugs (Socket Outlets), showing clearly how live, neutral and earth wires are connected to each element. (5 marks)
- (b) Describe the difference between Alternating Current (AC) and Direct Current (DC) giving two advantages of each. (5 marks)
- (c) Motors and generators are electromagnetic devices. They have current-carrying loops that rotate in magnetic fields. Describe the differences between a motor and a generator considering main principle of working and function (5 marks)
- (d) 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)

Q6.

- (a) Describe the difference between Overload Current and Short Circuit Current. Which one is more dangerous?
(5 marks)
- (b) 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)
- (c) Describe the following definitions applicable to lighting;
(i) Luminous intensity (ii) Luminous flux and (iii) Luminous Efficacy
(5 marks)
- (d) Define the term 'daylight factor' used in building illumination and how this can be increased.
(5 marks)

Q7.

- (a) Contrast and compare advantage(s) and disadvantage(s) of Incandescent light bulb, Compact Fluorescent Light (CFL) bulbs and Light Emitting Diode (LED) bulbs.
(5 marks)
- (b) What is an electrical transformer? Explain the function of it with a neat diagram showing relationship among input voltage (V_1), output voltages (V_2), primary winding (N_1) and secondary winding (N_2).
(5 marks)
- (c) Briefly explain the concept of air-conditioning (often refers to as AC) process with reference to equipment used.
(5 marks)
- (d) Draw a sketch of psychrometric chart for moist air and indicate how you would represent the processes of heating, cooling, humidification and dehumidification.
(5 marks)