

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	: CVX4535/CEX4235 Building Engineering
Academic Year	: 2017/18
Date	: 10 th February 2019
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.
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Q1.

- (a) The quality, time and cost considerations of a project are interdependent. Discuss this Scenario giving examples. (5 marks)
- (b) There are four main stages of work in any building project. Briefly discuss these four stages. (5 marks)
- (c) If you are assigned as a project manager of a mega construction project like defence headquarters, what would be your main role? (5 marks)
- (d) Almost all clients expect to get 'Cost Effective Solutions' for their requirements from their consultants and contractors. What does this mean? Briefly explain in your words. (5 marks)

Q2.

- (a) 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)
- (b) Differential settlement is an undesirable factor for civil structures. What do you understand by 'differential settlement' of foundations? (5 marks)
- (c) Describe what a load bearing wall is. List an advantage and a disadvantage of load bearing walls. (5 marks)
- (d) The dimension paper used for taking off quantities is sometimes referred to as "Taking off sheet". Demonstrate the use of the dimension paper with respect to taking off quantities for Four 3.0 m high reinforced concrete columns 400 x 300mm in size in ground floor of a building. Limit your exercise to the items 'formwork' and 'reinforced concrete' only. (5 marks)

Q3.

- (a) Quality of water supplied to consumers should be within acceptable limits. State four important qualities of water expected by consumers. (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 how floating light clay particles are converted into heavy flocks which settle easily in a water treatment plant during the water purification process. (5 marks)
- (d) State two advantages and disadvantages each of "branched" and "grid" systems of water distribution. (5 marks)

Q4.

- (a) Plumbing traps are an important part of building plumbing system. Draw sketches of two types of traps and explain why these traps are so important in a waste water system. (5 marks)
- (b) Draw a clear sketch of a septic tank giving rough length proportions and naming important parts. (5 marks)
- (c) High-rise housing, a trend in densely populated cities around the world, increases challenges for water supply. Describe two different methods used to supply water to tall buildings. (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. Name and describe two methods of disposal of solid waste and their applicability for Sri Lanka. (5 marks)

Q5.

- (a) Types of bonds in brick masonry wall construction are classified based on laying and bonding style of bricks in walls. Describe two types of brick bonds in masonry works. (5 marks)
- (b) Strength of brick walls depends on several factors. Name and briefly describe **three** such factors. (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) Pile foundations and Raft foundations are widely used for medium rise buildings. Distinguish the difference between these two types giving an advantage and a disadvantage of each. (5 marks)

Q6.

- (a) In today's world electricity is most important next to the oxygen in the human. Here energy will be in two forms; alternating current (AC) and direct current (DC). Briefly describe four advantages of using alternating currents. (5 marks)
- (b) Indicating main components, sketch the circuit diagram of a typical household electrical installation with two sub circuits. (5 marks)
- (c) Motors and generators are electromagnetic devices. They have current-carrying loops that rotate in magnetic fields. They are differentiated on various factors like the main principle of working or function. Describe the differences between motor and generator. (5 marks)
- (d) Explain the concept of 'Root Mean Square - R.M.S.' used in measurement of AC currents and voltages. (5 marks)

Q7.

- (a) Describe the difference between Overload Current and Short Circuit Current. Which one is more dangerous? (5 marks)
- (b) Briefly describe the operational principle of a Residual Current Circuit Breaker (RCCB) with a clear sketch. (5 marks)
- (c) Briefly explain what do you understand by the following definitions applicable to lighting; Luminous intensity, Luminous efficacy and Illuminance. (5 marks)
- (d) List four types of treatments given to air in air-conditioning and indicate the four treatments in a psychometric chart. (5 marks)