

The Open University of Sri Lanka
Faculty of Engineering Technology
Department of Civil Engineering



Study Programme	: Bachelor of Science Honours in Engineering
Name of the Examination	: Final Examination
Course Code and Title	: CVX4446 Construction Engineering and Materials
Academic Year	: 2024/2025
Date	: Saturday, 28 th February 2026
Time	: 0930-1230hrs
Duration	: 3 hours

General Instructions

1. Read all instructions carefully before answering the questions.
2. This question paper consists of Eight (7) questions in Four (4) pages.
3. Answer a total of **Five (5) questions**. All questions carry equal marks.
4. Answer for each question should commence on a new page.
5. This is a Closed Book Test (CBT).
6. Do not use Red colour pen.

Q1. Answer the following questions with illustrations where necessary:

- (a) Briefly discuss five important factors to be considered before commencing excavations adjacent to an existing building. (05 marks)
- (b) Briefly explain three different types of formworks used for concrete. (05 marks)
- (c) Hauling and hoisting of material and machine parts is essential in construction work. Briefly explain four such various equipment and its purposes used in construction industry. (05 marks)
- (d) Choosing the right foundation is a highly technical decision that is to be made by building professionals. As an engineer how do you recommend a suitable foundation for your client based on the given ground conditions. (05 marks)

Q2.

- (a) Concrete is indeed the single most widely used material in the entire world. Briefly explain why concrete is so popular as a construction material. (5 marks)
- (b) Briefly explain how workability properties of concrete are measured. (05 marks)
- (c) Briefly describe five factors affecting strength of concrete. (05 marks)
- (d) Discuss the details that should be considered and planned by the contractor to ensure correct pumping of concrete is carried out in a construction of a high-rise building. (05 marks)

Q3.

- (a) Explain the differences between 'rigid pavements' and 'flexible pavements' in highway construction. (05 marks)
- (b) Draw a typical cross section of a road and briefly explain the four elements of a flexible pavement namely sub grade, sub base, base and wearing surface. (05 marks)
- (c) Pumps are used extensively in the construction sector for various purposes. Briefly explain three types of such pumps and their usage in the industry. (05 marks)
- (d) Briefly explain three types of macadam bases used in road construction (05 marks)

Q4.

- (a) There are two generally used systems of supplying water to buildings namely, the direct system, and the indirect system. Discuss these two different systems emphasizing on their usage. (05 marks)
- (b) Explain the differences between 'friction piles' and 'end bearing piles' with respect to the load transfer. (05 marks)
- (c) Joints in concrete construction are placed in concrete slabs and pavements at regular intervals to prevent development of cracks in concrete. Briefly explain four types of joints with help of a neat sketch(s). (05 marks)
- (d) Known for its strength and durability, concrete has been a cornerstone of construction for centuries. However, its environmental footprint has often been a point of concern. Briefly discuss how concrete can be made more sustainable to reduce environmental impact. (05 marks)

Q5. Cement, lime and sand constitute the fundamental components essential for making cement/lime mortars used in masonry and plastering work.

- (a) What is cement? What are cement types available in Sri Lanka? (05 marks)
- (b) State the requirements/characteristics that sand should have and four (04) functions of sand in a mortar. (05 marks)
- (c) Describe how slaked lime is prepared using tank slaking method. (05 marks)
- (d) Describe a simple test to differentiate between calcareous lime and magnesium lime. (05 marks)

Q6.

- (a) Explain how plywood is produced and state four (04) advantages of plywood. (05 marks)
- (b) What is Biodegradable geotextile? Explain the applications and advantages of Biodegradable geotextiles over synthetic geotextiles. (05 marks)
- (c) Emulsion paint has been proposed for both exterior and interior walls of a cottages. State the essential constituents of a paint and their role. (05 marks)
- (d) What are alloys? Explain two types of alloys used in different industries (05 marks)

Q7.

- (a) Explain the difference between Geomats and Geomeshes. Also give two (02) applications of each. (05 marks)
- (b) Describe types of asbestos and their applications in the construction industry. (05 marks)
- (c) A geotextile is to be embedded to the rear side of a retaining wall. Explain two (02) distinctive functions of geotextile. Provide a clear diagram to demonstrate the proper embedding of geotextile. (05 marks)
- (d) What is Fiberglass? State the usage of fiberglass in construction Industry. (05 marks)