



UNIVERSITY OF RUHUNA

Faculty of Engineering

End-Semester 5 Examination in Engineering: March 2026

Module Number: CE5301

Module Name: Construction Processes and Technology

[Three Hours]

[Answer all questions, each question carries twelve marks.]

Q1.

- a) "Setting out is done on the principal of whole to part." Briefly explain this statement. [2.0 Marks]
- b) Briefly explain with sketches what aspects of a building are controlled during the setting out procedure. [3.0 Marks]
- c) Provide a graphical illustration of the procedure for setting out a horizontal curve in building construction. [2.0 Marks]
- d) Explain how 90° , 60° and 45° angles can be set out on a relatively flat ground using measurement tapes only. [3.0 Marks]
- e) Explain the methods used to transfer the ground floor coordinate system to upper floors in a high-rise building. [2.0 Marks]

Q2.

- a) List two causes of cracks in brick walls and suggest preventive measures. [2.0 Marks]
- b) What are the qualities of a good mortar mix? [2.0 Marks]
- c) Briefly discuss the various types of foundations used in building construction. [3.0 Marks]
- d) Briefly explain the different modes of failure of foundations in buildings. [2.0 Marks]
- e)
 - i. What are the indications of ground subsidence beneath a building?
 - ii. Discuss how the building can be restored through an underpinning of the existing foundation? [3.0 Marks]

Q3.

- a) What is meant by a construction mobilization plan? List out three items available in a mobilization plan. [2.0 Marks]

- b) List two advantages of using each of the following site documents.
 - i. Variation Orders
 - ii. Construction Specifications

[3.0 Marks]
- c) List three main parties involved in a construction project and discuss their roles.

[3.0 Marks]
- d) Briefly discuss the use of having an organization chart for a construction project.

[2.0 Marks]
- e) List any two principles of sustainable construction and briefly explain to what extent they are being used in Sri Lankan construction industry.

[2.0 Marks]

Q4.

- a) What are the factors to be considered in determining the roof pitch for a building?

[2.0 Marks]
- b) Sketch a typical cross section of a gable roof with Calicut pattern tiles laid using roof elements namely; ridge plates, purlins, wall plates, rafters, and reapers. Your answer should include details of the main elements and appropriately assumed spacing. The roof slope is 30° and, the roof projection is 1m from the external walls. The wall thickness is 225 mm for load bearing walls.

[5.0 Marks]
- c) Discuss any two different modes of structural failure of a timber rafter roof and suggest solutions to prevent these failures.

[3.0 Marks]
- d) List two preventive actions that can be taken to overcome issues associated with flat roof designs.

[2.0 Marks]

Q5.

- a) Describe the procedure for the following items.
 - i. Cut and fill method in road construction
 - ii. Pipe laying in an open trench

[4.0 Marks]
- b) Briefly describe soil stabilization methods used in road construction works.

[2.0 Marks]
- c) List three challenges encountered during tunnel construction and suggest appropriate remedial measures to address them.

[3.0 Marks]
- d) Briefly discuss two tunnel excavation methods commonly used in development projects.

[3.0 Marks]