



# UNIVERSITY OF RUHUNA

## Faculty of Engineering

End-Semester 5 Examination in Engineering: March 2022

Module Number: CE5301

Module Name: Construction Processes and Technology

[Three Hours]

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

Q1.

- a) Explain the importance of carrying out proper building setting out for structurally stable and aesthetically feasible building. [2.0 Marks]
- b) Briefly explain with sketches what aspects of a building are controlled during the setting out procedure. [3.0 Marks]
- c) Explain the procedure for protecting peg stations on the site of a multistory building construction project during the construction stage. [2.0 Marks]
- d) Explain how  $90^\circ$ ,  $60^\circ$  and  $45^\circ$  angles can be set out on a relatively flat ground using only the measurement tapes. [3.0 Marks]
- e) Explain how the coordinate system on the ground floor can be transferred to higher level floors in a high-rise building. [2.0 Marks]

Q2.

- a) Sketch and name various types of foundations used in building constructions. [2.0 Marks]
  - b) List FOUR different types of foundation failures in buildings. [2.0 Marks]
  - c) Briefly explain the ground conditions where pile foundations should be used in building construction. [2.0 Marks]
  - d) Briefly explain with sketches the bored pile construction procedure when drilling through loose soil or very soft clay below the water table. [2.0 Marks]
  - e) Briefly explain [2.0 Marks]
    - i. TWO reasons for pile foundation failures and
    - ii. identify the preventive measures to overcome each of these failures.
  - f) What are the functions of the DPC and plinth layers in brick wall construction? [4.5 Marks]
- [2.0 Marks]

Q3.

- a) What is meant by site mobilization? Briefly discuss preliminary project works to be carried out during the site mobilization stage. [3.0 Marks]
- b) List FOUR mandatory site facilities that should be incorporated into a construction site. [2.0 Marks]
- c) Briefly explain the different functions of bulldozers, motor scrapers and draglines in excavation works. [3.0 Marks]
- d) List various types of excavation works at which "clamshells" are used. [2.0 Marks]
- e) Briefly discuss what types of special safety precautions should be taken during manual excavations of trenches. [2.0 Marks]

Q4.

- a) Briefly discuss the procedure for plastering, rendering, and applying wall putty for brick walls. [3.0 Marks]
- b) Sketch a top view of a pitched roof and name the basic terminologies. [3.0 Marks]
- c) Compare and contrast the roof construction process using "Calicut tile roof coverings" with "Asbestos roof coverings". [2.0 Marks]
- d) Discuss TWO different modes of structural failure of a timber rafter roof and suggest solutions to prevent each of these failures. [2.0 Marks]
- e) Briefly discuss TWO preventive actions that can be taken to overcome moisture damage to timber roofs. [2.0 Marks]

Q5.

- a) Describe the construction procedure for the following items: [4.5 Marks]
- i. Cut and fill method in road construction
  - ii. Pipe Laying in an open trench
  - iii. Drill & Blast Method of Tunnelling
- b) Briefly explain what is meant by: [4.5 Marks]
- i. Trenchless pipeline installation
  - ii. Climbing shutters
  - iii. Soil stabilization
- c) Consider the excavation phase of a tunnel construction site. [3.0 Marks]
- i. Briefly discuss possible socio-environmental impacts and,
  - ii. suggest preventive measures to overcome these impacts.