



## TECHNICAL UNIVERSITY OF MOMBASA

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SCHOOL OF ENGINEERING AND TECHNOLOGY

Department of BUILDING & Civil engineering

**UNIVERSITY EXAMINATION FOR:**

BACHELOR OF TECHNOLOGY IN CIVIL ENGINEERING

**TCV 4211 : CONSTRUCTION TECHNOLOGY I**

END OF SEMESTER EXAMINATION

**SERIES: AUGUST 2024**

**TIME: 2 HOURS**

### **Instructions to Candidates**

You should have the following for this examination

*-Answer booklet, examination pass and student ID*

This paper consists of **five** questions.

Attempt question ONE (Compulsory) and any other TWO questions

**Do not write on the question paper.**

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### **QUESTION ONE (COMPULSORY)**

- a) Use well labelled drawings to differentiate between the following shoring systems using well labelled diagrams (5 Marks)
  - i. Raking shores
  - ii. Flying shores
- b) Draw a neat diagram of an independent scaffold and label any TEN components (10 Marks)

**ANSWER ANY TWO QUESTIONS FROM THIS SECTION**

### **QUESTION TWO (20 Marks)**

- a) What is a retaining wall and what is it used for? Define the following terms as used in retaining walls. (10 Marks)
  - i. Surcharge
  - ii. Keyway
  - iii. Batter

- iv. Retained height
  - v. The base slab
  - vi. Stem
  - vii. Toe
  - viii. Heel
- b) Draw a well labelled diagram illustrating the cantilever needle beam underpinning method and describe the method of construction. (10 Marks)

### **QUESTION THREE (20 Marks)**

- a) What is a pile? (1 Mark)
- b) Which conditions necessitate the use of piles? (3 Marks)
- c) Describe the classification of piles based on the following: (16 Marks)
  - i. The way in which they transmit their loads
  - ii. The method of construction

Use well labelled sketches to further illustrate your answers

### **QUESTION FOUR (20 Marks)**

- a) Differentiate between ground water and sub-soil water. Use a sketch to further illustrate your answer. (4 Marks)
- b) Which problems could be encountered by water retained in the subsoil during construction? (2 Marks)
- c) Differentiate between temporary and permanent exclusion of water citing two examples in each case. (4 Marks)
- d) Describe the electro-osmosis dewatering method. Use a well-labelled diagram to further demonstrate your answer. (10 Marks)

### **QUESTION FIVE (20 Marks)**

- a) Describe the following methods of basement excavation citing the advantages and disadvantages. (12 Marks)
  - i. Sloped full open-cut method
  - ii. Anchored method
  - iii. Island method
- b) Draw a well labeled diagram of a site layout for a medium sized project. (8 Marks)