TECHNICAL UNIVERSITY OF MOMBASA

SCHOOL OF ENGINEERING AND TECHNOLOGY
Department of BUILDING & Civil engineering
UNIVERSITY EXAMINATION FOR:

BACHELOR OF TECHNOLOGY IN CIVIL ENGINEERING
TCV 4211 : CONSTRUCTION TECHNOLOGY I

SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: MARCH 2025
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.

QUESTION ONE (COMPULSORY)

a) Differentiate between scaffolds and shores. (2 Marks)
b) Draw a well labelled diagram of a trussed-out scaffold. (12 Marks)
c) Differentiate between the following shoring systems (6 Marks)
   i) Raking shores
   ii) Flying shores
   iii) Dead shores

ANSWER ANY TWO QUESTIONS FROM THIS SECTION
QUESTION TWO (20 Marks)

a) What is underpinning as used in construction? (1 Mark)

b) Which conditions can necessitate the need of underpinning a structure? (9 Marks)
c) Differentiate between mass concrete underpinning method (pit method) and underpinning by pier and beam underpinning method. Use sketches to further illustrate your answer. (10 Marks)

QUESTION THREE (20 Marks)

a) State the design principles of retaining walls. (4 Marks)
b) How does ground water behind a retaining wall affects its design and stability? (3 Marks)
c) Draw a well labeled diagram of a mass concrete retaining wall. (5 Marks)
d) Draw a well labeled diagram of a site layout for a medium sized project. (8 Marks)

QUESTION FOUR (20 Marks)

a) What is a pile? (1 Mark)
b) Which conditions necessitate the use of piles? (4 Marks)
c) Piles can be classified according to the mode of construction. Discuss and differentiate between any two types of piles in each category. (10 Marks)
d) Discuss and draw a well labelled diagram of a piled basement construction. (5 Marks)

QUESTION FIVE (20 Marks)

a) Differentiate between ground water and sub-soil water. Use a sketch to further illustrate your answer. (3 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. Discuss any two methods used in each classification. (10 Marks)
d) When are cantilever foundations used in construction works? Draw a well labeled diagram of a cantilever foundation (5 Marks)