



TECHNICAL UNIVERSITY OF MOMBASA

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN CIVIL ENGINEERING

DCE 2210 CIVIL ENGINEERING CONSTRUCTION AND DESIGN

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 any **THREE** questions.

Do not write on the question paper.

QUESTION ONE (20 MARKS)

1 a) State the safety requirements in a tunnel (4 Marks)

b) Define the following terms used in tunneling

i) Crown

ii) Springline

iii) invert

iv) heading

i) Wall

ii) Poatal

iii) Drift

(8 marks)

- c) A weir of 8m long is to be built across a rectangular channel to discharge a flow of $9\text{m}^3/\text{s}$. If the maximum depth of water on the upstream side of the weir is to be 2m, what should be the height of the weir? Adopt $C_d=0.62$ (8 Marks)

QUESTION TWO (20 MARKS)

2. a) List THREE types of Dams (3 Marks)
- b) State the functions of a dam (5 Marks)
- c) State SIX classes and styles of flumes (6 Marks)
- d) With clear sketches define the following pressures on retaining walls
- i) Active Pressure
- ii) Passive Pressure
- iii) At rest Pressure (6 Marks)

QUESTION THREE (20 MARKS)

3. a) State TWO examples of the following classification of weirs:
- iv) According to shape
- v) According to the nature of discharge
- vi) According to the width of crest
- vii) According to the nature of crest (6 Marks)
- b) i) define the term spillway as a water regulating structure
- ii) State TWO classifications of spillways (4 Marks)
- b) A rectangular weir of 4.5metres long has a 300mm head of water. Determine the discharge over the weir, if the coefficient of discharge is 0.6. (10 marks)

QUESTION FOUR (20 MARKS)

4. a) list Three types of foundations (3 Marks)
- b) i) State TWO causes of foundation failure
- ii) Define a Weir (5 Marks)
- c) state TWO classification of wells (2 marks)
- d) Describe the following processes in the construction of wells
- i) Rotary
- ii) Pneumatic
- iii) Drilling rigs (10 marks)

QUESTION FIVE (20 MARKS)

5. a) the daily record of rainfall over a catchment area is 0.2million cubic metres. It has been found that 80% of the rain water reaches the storage reservoir and then passes over a rectangular weir. What should be the length of the weir, if the water is not to rise more than 400mm above the crest. Assume $C_d= 0.61$ (10 marks)

b) An Ogee weir of 4 meters long has 500mm head of water. Find the discharge over the weir, if $C_d=0.62$ (10 marks)