



# THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of Jkuat)

*Faculty of Engineering and Technology*

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

**DIPLOMA IN CIVIL ENGINEERING (DC 10B)**  
**DIPLOMA IN ARCHITECTURE (DA 10B)**  
**DIPLOMA IN BUILDING & CIVIL ENGINEERING (DBC 10 B)**

EBC 2207: CIVIL ENGINEERING CONSTRUCTION I

**END OF SEMESTER EXAMINATION**

SERIES: AUGUST/SEPTEMBER 2011

**TIME: 2 HOURS**

**Instructions to Candidates:**

You should have the following for this examination

- *Answer booklet*
- *Drawing instruments*

This paper consists of **FIVE** questions

Answer question **ONE**, which is **COMPULSORY** and **TWO** other questions

Maximum marks for each part of a question is as shown

This paper consists of **THREE** printed pages

## SECTION A (COMPULSORY)

### Question 1

- a) (i) Define the term caisson
- (ii) State the main difference between caisson and cofferdam
- (iii) With the aid of a sketch, show the construction of caisson where a hard bearing layer is not Available at foundation level (9 marks)
- b) (i) State the **TWO** functional requirements of foundations
- (ii) State the **THREE** situations that necessitate the use of rafts (6 marks)
- c) State **THREE** advantages and **THREE** disadvantages of mass retaining walls (6 marks)
- d) State **SIX** indicators in determining suitability of labour-based methods (6 marks)
- e) State the **THREE** causes of tilting of caissons during installation (3 marks)

## SECTION B (Answer any TWO questions)

### Question 2

- a) Explain **FIVE** indicators of application of the labour-based approach (10 marks)
- b) With the aid of a labeled sketch, describe the operation of pneumatic caissons (10 marks)

### Question 3

- a) State the **FOUR** reasons for underpinning (6 marks)
- b) With the aid of a labeled sketch, describe a cantilever wall (10 marks)
- c) State the **FOUR** factors to be considered in design of double-wall cofferdams (4 marks)

### Question 4

- a) (i) Sketch and label a freestanding precast concrete retaining wall
- (ii) State **FIVE** advantages of the structure in (a) (i) above (12 marks)
- b) With the aid of a sketch, describe the working principles of a multi-stage dewatering installation system (8 marks)

### Question 5

- a) (i) State the **THREE** circumstances that necessitate the use of piles as foundations
- (ii) State the **FOUR** factors upon which selection of piling system relies (8 marks)
- b) With the aid of sketches, show the **THREE** methods of water cut-off in rock fill cofferdam construction where high water heads are experienced (12 marks)