



# THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)  
*Faculty of Engineering and Technology*

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING  
UNIVERSITY EXAMINATION FOR DEGREE IN BACHELOR OF  
ENGINEERING IN BUILDING & CIVIL ENGINEERING

EBC 2130: CIVIL ENGINEERING MATERIALS I

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 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 (COMPULSORY)** from **SECTION A** and any other **TWO** questions from **SECTION B**

Maximum marks for each part of a question are clearly shown

This paper consists of **TWO** printed pages

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## SECTION A (COMPULSORY)

### Question 1

- a) (i) Outline **FIVE** factors that affect the strength of concrete  
(ii) Briefly describe **FOUR** requirements of concrete mix design (11 marks)
- b) Briefly describe the following types of concrete  
(i) Previous concrete  
(ii) Shotcrete concrete  
(iii) Air entrained concrete (9 marks)
- c) Briefly describe **FIVE** factors that influenced the choice of traditional construction materials (10 marks)

**SECTION B (Answer any TWO questions from this section)**

**Question 2**

- a) (i) Outline **THREE** benefits of curving concrete  
(ii) Briefly describe **THREE** methods of curving giving an example in each case (12 marks)
- b) (i) Differentiate between tilting drum mixer and pan mixer  
(ii) Outline **FOUR** qualities of good formwork (8 marks)

**Question 3**

- a) Define the following terms:  
(i) Admixture  
(ii) Additive (4 marks)
- b) (i) Briefly describe any **THREE** categories of admixtures  
(ii) State **FOUR** uses of reinforcement in concrete  
(iii) Outline **FOUR** factors considered in the placement of concrete (16 marks)

**Question 4**

- a) (i) Outline **FOUR** factors that affect quality control in concrete  
(ii) Briefly describe **FOUR** mechanical properties of aggregates (14 marks)
- b) Briefly explain the following properties of fresh concrete  
(i) Workability  
(ii) Mouldability  
(iii) Compatibility (6 marks)

**Question 5**

- a) Briefly describe the following tests done on fresh concrete  
(i) Slump test  
(ii) Compacting factor test (8 marks)
- b) (i) Outline **FOUR** advantages of using masonry units in construction of buildings  
(ii) State **THREE** types of stone deterioration  
(iii) State any **THREE** methods of mix design in concrete (12 marks)