



# THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of Jkuat)

*Faculty of Engineering and Technology*

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

**CONSTRUCTION TECHNICIAN II**

EBC 1112: CONSTRUCTION MATERIALS III

**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*
- *Pocket calculator*

This paper consists of **FIVE** questions

Answer question **ONE** and any other **TWO** questions

Maximum marks for each part of a question are as shown

This paper consists of **THREE** printed pages

## SECTION A (COMPULSORY)

### Question 1

- a) State the main stages in the manufacture of Portland cement (8 marks)
- b) Briefly describe the following types of mixers
- (i) Tilting drum mixer
  - (ii) Pan-type mixer
  - (iii) Dual-drum mixer (6 marks)
- c) (i) Differentiate between admixtures and additives
- (ii) State **FOUR** types of admixtures (10 marks)
- d) State **THREE** factors to consider when selecting a material for formwork (6 marks)

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

### Question 2

- a) Explain the following properties of aggregates
- (i) Toughness
  - (ii) Hardness
  - (iii) Porosity and absorption
  - (iv) Bulk density (8 marks)
- b) Briefly describe the following tests carried out on fresh concrete
- (i) Slump test
  - (ii) Compacting factor test
  - (iii) Flow table test (12 marks)

### Question 3

- a) Explain the following methods of batching
- (i) Batching by volume
  - (ii) Batching by weight (4 marks)
- b) Explain the following terms
- (i) Designed mix
  - (ii) Prescribed mix (4 marks)
- c) State any **SIX** factors that affect the strength of concrete (12 marks)

#### Question 4

- a) Explain the following methods of preparation and fixing of reinforcement for concrete
- (i) Welding
  - (ii) Lapping
  - (iii) Binding
  - (iv) Spacing
- (8 marks)
- b) Explain any **SIX** factors that directly influence the quality of concrete (12 marks)

#### Question 5

- a) Outline **THREE** requirements to be fulfilled in the transportation of concrete (6 marks)
- b) Explain the **THREE** types of curing methods giving an example in each case (9 marks)
- c) State any **THREE** factors that may lead to segregation of fresh concrete (5 marks)