



**THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE**

**(A Constituent College of JKUAT)**

(A Centre of Excellence)

# **Faculty of Engineering & Technology**

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

**CONSTRUCTION TECHNICIAN II**

EBC 1113: CONSTRUCTION MATERIAL IV

**END OF SEMESTER EXAMINATION**

**SERIES: AUGUST 2012**

**TIME: 2 HOURS**

**Instructions to Candidates:**

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions. Answer any **THREE** questions  
Maximum marks for each part of a question are as shown  
This paper consists of **THREE** printed pages

### Question One (20 Marks)

- a) Outline the following concrete mixes and state the limitations in use:  
i) Nominal mixes  
ii) Prescribed mixes  
iii) Design mixes **(6 marks)**
- b) Determine the material requirements by weight to produce 120m<sup>3</sup> of concrete mix 1:2:4 if concrete yields by 20%.

#### Data

|                      |   |                       |                   |
|----------------------|---|-----------------------|-------------------|
| - Density of sand    | = | 1600kg/m <sup>3</sup> |                   |
| - Density of ballast | = | 1400kg/m <sup>3</sup> |                   |
| - Density of cement  | = | 1440kg/m <sup>3</sup> |                   |
| - Water/cement ratio | = | 0.7                   | <b>(14 marks)</b> |

### Question Two (20 marks)

- a) Outline the following modes of transporting concrete and state their limitations to improve efficiency.  
i) Wheel barrows  
ii) Dumpers  
iii) Mono-rail transporters  
iv) Pumping  
v) Skips and buckets. **(12 marks)**
- b) Distinguish between fresh and hardened concrete. **(4 marks)**
- c) State **FOUR** requirements to be observed while transporting concrete. **(4 marks)**

### Question Three (20 marks)

- a) State **SIX** functional requirements of good form work. **(12 marks)**
- b) State **THREE** purposes of form work. **(6 marks)**
- c) Outline the fabrication and striking of form work with particular reference to re-use. **(2 marks)**

### Question Four (20 marks)

- a) Define the following  
i) Mixing time  
ii) Mixing cycle  
iii) Output of mixers. **(8 marks)**
- b) Outline the mode of operation of the following types of mixers:  
i) Ready-mix concrete trucks

- ii) Tilting drum
- iii) Non-tilting drum
- iv) Reversing drum. **(12 marks)**

**Question Five (20 marks)**

- a) Describe the following concrete placing operations:
- i) Placing in cold weather
  - ii) Under-water placing
  - iii) Concreting in deep lifts. **(15 marks)**

- b) Outline the following concrete surface finishes.
- i) Granolithic
  - ii) Tiling
  - iii) Board marked surfaces. **(5 marks)**