



TECHNICAL UNIVERSITY OF MOMBASA  
**Faculty of Engineering &  
Technology**

DEPARTMENT OF BUILDING & CIVIL ENGINEERING  
**DIPLOMA IN ARCHITECTURE (DARC 12J)**

EAR 2305: MATERIAL SCIENCE II

**END OF SEMESTER EXAMINATION**  
SERIES: DECEMBER 2013  
**TIME ALLOWED: 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

- a) Explain the meaning of soil stabilization (3 marks)
- b) Briefly explain cement stabilization (6 marks)
- c) State FIVE reasons that make cement stabilization popular (5 marks)
- d) State the effects of compaction during soil stabilization (6 marks)

### Question Two

- a) Define the following:
  - (i) Grout
  - (ii) Mortar (4 marks)
- b) Explain THREE methods used to mix lime cement mortar (6 marks)
- c) Briefly explain the following mortar tests:
  - (i) Adhesiveness
  - (ii) Cohesiveness/tensile strength (6 marks)
- d) State FOUR precautions in the use of mortars (4 marks)

### Question Three

- a) Briefly explain the production process of fibre-cement roofing sheet. (7 marks)
- b) Briefly describe the following rendering surface finishes:
  - (i) Rough cast
  - (ii) Pebble dash
  - (iii) Spatter dash (6 marks)
- c) Explain the benefits and challenges of using Makuti thatch (7 marks)

### Question Four

- a) Briefly explain earth-building as renewable technology (6 marks)
- b) Briefly explain the production of compressed earth-blocks using the following methods:
  - (i) Manual presses
  - (ii) Mobile production units (7 marks)
- c) Briefly explain FOUR main families of compressed earth blocks (7 marks)

### **Question Five**

- a) Explain the following types of preservatives:
- (i) Coal tar creosote
  - (ii) Organic solvent type
- (10 marks)**
- b) State FIVE requirements for a good preservative
- (5 marks)**
- c) State FIVE methods of maintaining coral stones
- (5 marks)**