



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

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

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

DIPLOMA IN BUILDING & CIVIL ENGINEERING

ECE 2206: CONSTRUCTION MATERIALS I

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: MAY/JUNE 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. Question **ONE** is compulsory

Maximum marks for each part of a question are clearly shown

This paper consists of **TWO** printed pages

Question 1 (Compulsory - 30 marks)

- a) Outline the manufacture of ordinary Portland cement, using the dry process, and state the constituent materials used in the manufacture (8 marks)
- b) Explain the setting process and describe tests to measure the initial and final setting of cement (8 marks)
- c) (i) State the significance of grading aggregates (4 marks)
(ii) Describe the process of grading coarse aggregates giving typical results in a graphical form (10 marks)

Question 2 (20 marks)

- a) (i) Describe the following process involved in the production of concrete:-
- Batching
- Mixing
- Transportation
- Placing
- Curing (12 marks)
- b) State the necessary precaution essential in the processes mentioned in 2(a) above, to ensure concrete of optimum strength and durability (8 marks)

Question 3 (20 marks)

- a) Define the term workability and outlines the main factors which influence it (8 marks)
- b) Describe the compacting factor tests for determining workability, indicating typical results and the application of the results (12 marks)

Question 4 (20 marks)

- a) Outline the main factors that influence the strength properties of concrete (12 marks)
- b) Describe the Schmidt hammer test to determine the strength of hardened concrete (8 marks)

Question 5 (20 marks)

- a) Outline the main factors that influence permeability of concrete and suggest measures to limit the process (8 marks)
- b) Explain the process of dry shrinkage in concrete (12 marks)