



MACHAKOS UNIVERSITY

University Examinations for 2022/2023

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

SECOND YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (CIVIL ENGINEERING)

ECV 205: CIVIL ENGINEERING MATERIALS I

DATE:

TIME:

INSTRUCTIONS

- This paper comprises of *FIVE* questions. Answer **THREE** questions
- Question one is **compulsory** and carry 30 marks
- Answer any other **TWO** questions

QUESTION ONE (COMPULSORY) (30 MARKS)

- a) Define the following terms as used in Concrete Technology:
- i. Batching
 - ii. Compaction
 - iii. Tilting mixing
 - iv. Mass concreting
 - v. Segregation (5 marks)
- b) Describe good qualities of the following masonry building materials:
- i. Clay bricks.
 - ii. Building stone (8 marks)
- c) Calcareous and argillaceous raw materials are used in the manufacture of Portland cement. With aid of flow diagram, describe dry process of manufacture of cement. (8 marks)
- d) In aid of sketches briefly describe Cement soundness test by use of Le-Chatelier method. (9 marks)

QUESTION TWO (20 MARKS)

- a) Define workability and explain factors affecting concrete workability (10 marks)
- b) Describe the following workability tests:
 - i. Slump test
 - ii. Compacting factor test (10 marks)

QUESTION THREE (20 MARKS)

- a) Define Terracotta as a building material and state SIX desirable characteristics of Terracotta (10 marks)
- b) Diagrammatically describe operations involved in the manufacture of clay bricks. (10 marks)

QUESTION FOUR (20 MARKS)

- a) Define the term Non-Destructive test (2 marks)
- b) State and explain FOUR circumstances required to use Non-Destructive Testing method on new concrete (10 marks)
- c) State and explain FOUR factors affecting the durability of concrete used in normal conditions (8 marks)

QUESTION FIVE (20 MARKS)

- a) Define the term Aggregate (2 marks)
- b) State and explain Five desirable characteristics of a good Aggregates (8 marks)
- c) Describe a Compressive strength Test of a building stone (10 marks)