



TECHNICAL UNIVERSITY OF MOMBASA

SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF ARCHITECTURE & BUILT ENVIRONMENT
UNIVERSITY EXAMINATION FOR:
BACHELOR OF ARCHITECTURAL STUDIES/BACHELOR OF
ARCHITECTURE

EAR 4110: CONSTRUCTION MATERIALS I

END OF SEMESTER EXAMINATION

YEAR ONE SEMESTER II

SERIES: APRIL 2022

TIME: 2 HOURS

DATE: Pick Date April 2022

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

Do not write on the question paper.

QUESTION ONE (30 MARKS)-COMPULSORY

- a) Describe the causes of defects in mortar joints of building stones. (6 marks)
- b) Explain the role of each of the following constituents of clay in fired bricks:
 - i. Alumina
 - ii. Silica (6 marks)
- c) Explain the effects of water content on the properties of wet and hardened concrete. (9 marks)
- d) Describe THREE causes of cracks in hardened concrete (9 marks)

QUESTION TWO (20 MARKS)

- a) Describe THREE methods of producing lightweight concrete. (6 marks)
- b) Explain the grading of aggregates in concreting (6 marks)
- c) Explain the methods of protecting concrete from sulphate attack. (8 marks)

QUESTION THREE (20 MARKS)

- a) Outline FIVE causes of segregation of concrete. (5 marks)
- b) Explain FIVE factors that affect the compressive strength of concrete. (15 marks)

QUESTION FOUR (20 MARKS)

- a) Describe the benefits that make natural stone the preferred material for construction of walls compared to concrete. (8 marks)
- b) Explain FOUR causes of deterioration of building stones. (12 marks)

QUESTION FIVE (20 MARKS)

Discuss the sustainability benefits and challenges in the use of traditional grass and *makuti* materials for roofing.

(20 marks)