



TECHNICAL UNIVERSITY OF MOMBASA

**FACULTY OF ENGINEERING AND TECHNOLOGY IN CONJUNCTION WITH KENYA
INSTITUTE OF HIGHWAYS AND BUILDING TECHNOLOGY (KIHBT)**

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR:

HIGHER DIPLOMA IN BUILDING ECONOMICS

EBE 3113: CONCRETE AND TIMBER TECHNOLOGY I A

END OF SEMESTER EXAMINATIONS
SERIES: OCTOBER 2016

TIME: 2 HOURS

Instruction to candidates

You should have the following for this examination

- Answer booklet
- Pocket Calculator

This paper consist of five question.

Answer any three questions of the five questions

All question carry equal marks

Maximum marks for each part of a question are as shown

This paper consist of two printed pages

Question One

- a) Describe **FOUR** types of Portland cement and state their uses (10 marks)
- b) i) Explain the effect of fitness of cement on its properties
ii) How is fitness of cement measured? (7 marks)
- c) Explain soundness of cement and state the test used (3 marks)

Question Two

- a) Discuss the following properties of hardened concrete:
 - i) Strength
 - ii) Frost resistance (6 marks)
- b) Describe the following types of aggregates
 - i) gaseous aggregates
 - ii) fibres (4 marks)
- c) Describe how concreting is done under water (6 marks)
- d) State **FOUR** effects of air entrainment in concrete (4 marks)

Question Three

- a) Outline **FOUR** advantages of lightweight concrete in construction of buildings (6 marks)
- b) Using a sketch explain the dry processes of cement manufacture (6 marks)
- c) Explain **THREE** broad classifications of hydraulic cements (6 marks)
- d) Explain the main reason of adding gypsum in the manufacture of cement (2 marks)

Question Four

- a) State **TWO** considerations made when concreting under water (4 marks)
- b) Explain the role of tricalcium silicate, dicalcium silicate, tricalcium alluminate, and tetracalcium alluminoferrite in the hydration process of cement (4 marks)
- c) Describe the standard test for the determination of compressive strength of cement as per current Kenya standards (4 marks)
- d) Explain the factors that influence the choice of concrete mixers (4 marks)
- e) Explain the main reason for proper storage of cement and state **THREE** ways of storing cement (4 marks)

Question Five

- a) Describe **FOUR** types of batch mixers (8 marks)
- b) Explain the following properties of aggregates:
- i) Toughness
 - ii) Hardness
 - iii) Porosity and absorption
 - iv) Bulk density
 - v) Surface texture (10 marks)
- c) Define the term, “Flexural strength” and state why it is tested (2 marks)