



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) List **FOUR** advantages of ready mix concrete over normal concrete. (4 marks)
- b) State the differences between fine and coarse aggregates (3 marks)
- c) Explain the following properties of concrete and state the factors that influence them.
 - i) Bleeding
 - ii) Durability
 - iii) Segregation (9 marks)
- d) Discuss bulking of sand and its effects on batching of concrete (4 marks)

Question Two

- a) Give **SIX** factors affecting concrete strength and explain each (6 marks)
- b) Explain **TWO** types of concrete shrinkages Viz, autogenous and drying shrinkage (4 marks)
- c) Explain **TWO** types of deleterious substances in aggregate that interfere with concrete performance (6 marks)
- d) Cement quality may be affected by various errors. Explain (4 marks)

Question Three

- a) Using a sketch, illustrate the wet process of manufacture of cement (6 marks)
- b) State and explain the advantages of the dry process of manufacture of ordinary Portland cement (4 marks)
- c) Explain the advantages of good aggregates (4 marks)
- d) Describe the following types of concrete
 - i) Heavy concrete
 - ii) Shotcrete (6 marks)
 - iii) marks)

Question Four

- a) State the main chemical constituents of Portland cement and their contributions to the properties of cement (10 marks)
- b) Explain the following properties of fresh concrete:

- i) Shape and surface texture
 - ii) Cleanliness (4 marks)
- c) Explain the following properties of concrete and state the factors that influence them:
- i) Durability
 - ii) Creep (6 marks)

Question Five

- a) Explain the development of strength in concrete with age (6 marks)
 - b) Explain the following moisture content states of an aggregate
 - i) Saturated and surface dry
 - ii) Wet state
 - iii) Air dry state
 - iv) Bone dry state (8 marks)
- c) Explain permeability of hardened concrete and state SIX factors that influence permeability (6 marks)