



**THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE**

**((A Constituent College of JKUAT)**

(A Centre of Excellence)

**Faculty of Engineering &  
Technology in Conjunction with  
Kenya Institute of Highways and  
Building & Technology (KIHBT)**

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

**HIGHER DIPLOMA IN CONSTRUCTION**

(BUILDING ECONOMICS OPTION)

EBE 3113: CONCRETE & TIMBER TECHNOLOGY I

**END OF SEMESTER EXAMINATION**

**SERIES: AUGUST 2012**

**TIME: 2 HOURS**

**Instructions to Candidates:**

You should have the following for this examination

- *Answer Booklet*
- *Drawing Instruments*

This paper consists of **FIVE** questions

Answer any **THREE** questions

Maximum marks for each part of a question are as shown

This paper consists of **TWO** printed pages

**Question One (20 Marks)**

- a) Name and explain **FIVE** factors that influence the strength of concrete. **(10 marks)**
- b) Define the following as applied in concrete technology.  
i) Modulus of Elasticity  
ii) Creep **(4 marks)**
- c) Name and explain the **THREE** factors upon which rate of creep depend. **(6 marks)**

**Question Two (20 marks)**

- a) State the **THREE** ways by which the useful life of concrete is ordinarily limited. **(6 marks)**
- b) Briefly explain the **TWO** main causes of permeability in concrete. **(5 marks)**
- c) Distinguish the following aggregates:  
i) Fine  
ii) Coarse  
iii) All-in **(6 marks)**
- d) State **THREE** features that distinguish plastic shrinkage cracks on horizontal surfaces from other types of cracks. **(3 marks)**

**Question Three (20 marks)**

- a) State **FOUR** precautions to be observed during placing of concrete. **(8 marks)**
- b) Explain the term 'Bulking of Sand'  
i) State **THREE** effects of bulking of sand on concrete.  
ii) State the remedy for bulking of sand **(6 marks)**
- c) Outline the **THREE** methods of producing lightweight concrete. **(6 marks)**

**Question Four (20 marks)**

- a) With the aid of a sketch, outline the compaction factor test. **(15 marks)**
- b) Outline the flow test. **(5 marks)**

**Question Five (20 marks)**

- a) Briefly explain the methods of carrying out the following operations in regard to prestressed concrete:  
i) Pretensioning  
ii) Post-tensioning **(7 marks)**
- b) State **TWO** advantages of post-tensioning. **(3 marks)**
- c) State **SIX** general requirements for formwork. **(6 marks)**

d) State **FOUR** causes of increase in the temperature of concrete.

**(4 marks)**