



**THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE**

***Faculty of Engineering & Technology***

**DEPARTMENT OF CIVIL AND BUILDING ENGINEERING**

**DIPLOMA IN ENGINEERING  
DIPLOMA IN ARCHITECTURE  
CERTIFICATE IN ARCHITECTURE**

**EB 2205 : CIVIL ENGINEERING MATERIAL II**

**SEMESTER II EXAMINATIONS**

**APRIL/MAY 2010 SERIES**

**TIME: 2 HOURS**

**Instructions to Candidates**

Answer Question **ONE** and any other **TWO** Questions

### **Question ONE (30 Marks)**

- (a). Explain the following requirements of aggregates:
- (i). Shape and surface texture
  - (ii). Strength
  - (iii). Grading **(4½ Marks)**
- (b). Explain **THREE** points to observe during mixing of concrete. **(3 Marks)**
- (c). State **SIX** precautions to be taken during placing of concrete. **(6 Marks)**
- (d). Describe the following properties of fresh concrete:
- (i). Consistency
  - (ii). Mobility
  - (iii). Compatibility
  - (iv). Segregation **(8 Marks)**
- (e). List **FIVE** properties of hardened concrete **(2½ Marks)**
- (f). Outline the following types of admixtures.
- (i). Retarders
  - (ii). Accelerators **(6 Marks)**

### **Question TWO (20 Marks)**

- (a). State **THREE** main chemical constituents of Portland cement and their contributions to the properties of cement. **(8 Marks)**
- (b). State **FOUR** factors that affect workability. **(4 Marks)**
- (c). With aid of sketches, describe construction joint. **(4 Marks)**
- (d). Describe the following types of aggregates:
- (i). Gaseous aggregates
  - (ii). Fibres **(4 Marks)**

### **Question THREE (20 Marks)**

- (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 durability of hardened concrete and state **SIX** factors that influence Durability. **(6 Marks)**

**Question FOUR (20 Marks)**

- (a). Describe hydration and state the factors which affect the rate of hydration. **(5 Marks)**
- (b). (i). Explain the importance of curing in concrete work. **(3 Marks)**
- (ii). Explain **FIVE** methods of curing. **(7½ Marks)**
- (c). State **FIVE** general qualities of a good formwork. **(2½ Marks)**
- (d). State **TWO** aims of compacting concrete. **(2 Marks)**

**Question FIVE (20 Marks)**

- (a). Briefly outline the following types of concrete:
- (i). Reinforced
  - (ii). Prestressed
- (10 Marks)**
- (b). Explain pretensioning method of prestressed concrete. **(5 Marks)**
- (c). Explain hand mixing of concrete. **(5 Marks)**