



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)
Faculty of Engineering and Technology

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

DIPLOMA IN BUILDING & CIVIL ENGINEERING

DIPLOMA IN CIVIL ENGINEERING

EBC 2130: CIVIL ENGINEERING MATERIALS

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2011

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 clearly shown

This paper consists of **THREE** printed pages

Question 1 (20 marks)

- a) Briefly describe the following types of plastics.
(i) Thermoset plastics
(ii) Thermo plastics (4 marks)
- b) (i) State any **FIVE** characteristics of timber that makes it popular construction material
(ii) Briefly describe any **THREE** factors that affect the strength of timber (11 marks)
- c) (i) Outline **THREE** factors that affect structural properties of clay products
(ii) Describe Guillotining method of stone production (5 marks)

Question 2 (20 marks)

- a) Define the following giving an example in each case
(i) Ferrous metals
(ii) Non-Ferrous metals (4 marks)
- b) Briefly describe the following categories of stone
(i) Igneous stones
(ii) Sedimentary stones
(iii) Metamorphic stones (6 marks)
- c) With the aid of diagrams, illustrate the following timber defects
(i) Bow
(ii) Cup
(iii) Twist
(iv) Spring (10 marks)

Question 3 (20 marks)

- a) Describe the following components of oil based paints
(i) Body
(ii) Vehicle
(iii) Dryer (6 marks)
- b) (i) State **TWO** advantages of air seasoning of timber
(ii) Outline any **FOUR** methods of preservative application to timber (10 marks)
- c) Briefly describe the following types of plaster
(i) Lime plaster
(ii) Gypsum plaster (4 marks)

Question 4 (20 marks)

- a) (i) State **THREE** categories of glass and their areas of application
(ii) Outline the main function of Soda and Silica as constituents of glass (10 marks)

- b) Briefly describe the following types of adhesives
- (i) Drying adhesives
 - (ii) Pressure sensitive adhesives
 - (iii) Multi-part adhesives
- (6 marks)
- c) Describe the following types of Vanishes
- (i) Natural resin vanishes
 - (ii) Synthetic resin vanishes
- (4 marks)

Question 5 (20 marks)

- a) Briefly describe the following characteristics of a good paint
- (i) Wearability
 - (ii) Aesthetic
 - (iii) Practical and cost effective
- (6 marks)
- b) Define the following terms used in metallurgy
- (i) Pig iron
 - (ii) Ingot
 - (iii) Rust
- (6 marks)
- c) Describe the following types of deterioration in plastics
- (i) Chain scissoring
 - (ii) Cross-linking
 - (iii) Stress cracking
 - (iv) Loss of plasticizers
- (8 marks)