



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

Faculty of Engineering & Technology

DEPARTMENT OF CIVIL AND BUILDING ENGINEERING

**DIPLOMA IN CIVIL ENGINEERING WITH CAD
DIPLOMA IN BUILDING AND CIVIL ENGINEERING**

EB 2130 : CIVIL ENGINEERING MATERIALS I

END OF SEMESTER EXAMINATIONS

APRIL/MAY 2010 SERIES

TIME: 2 HOURS

Instructions to Candidates

This paper consists of FIVE questions.

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

Question ONE (30 Marks)

- (a). Using clear sketches, describe the macroscopic structure of wood. **(7 Marks)**
- (b). (i). Describe how metamorphic rocks are formed and give **TWO** examples. **(3 Marks)**
- (ii). State **FOUR** methods of preservation for stones. **(2 Marks)**
- (c). Define the following terms used in metals:
- (i). Tenacity
- (ii). Ageing
- (iii). Yield
- (iv). Proof stress **(6 Marks)**
- (d). List **FOUR** types of iron ores. **(2 Marks)**
- (e). (i). Outline **FOUR** characteristics of a good brick. **(6 Marks)**
- (ii). State **FOUR** advantages of block work over brickwork and **FOUR** disadvantages of clay blocks. **(4 Marks)**

Question TWO (20 Marks)

- (a). (i). Illustrate **FIVE** types of defects in timber. **(5 Marks)**
- (ii). Explain what is meant by grading of timber and state **TWO** methods used in Grading. **(3 Marks)**
- (b). State:
- (i). **FIVE** reasons for timber seasoning. **(2½ Marks)**
- (ii). **THREE** types of timber preservatives. **(1½ Marks)**
- (c). With aid of sketch, explain the following methods of conversion of timber:
- (i). Through and through
- (ii). Tangential sawing
- (iii). Quarter sawing **(6 Marks)**
- (d). State **FOUR** factors that affect the strength of timber. **(2 Marks)**

Question THREE (20 Marks)

- (a). Briefly describe the geological formation of the following rocks giving **TWO** examples of rocks in each case:
- (i). Igneous rocks
 - (ii). Sedimentary rocks
- (8 Marks)**
- (b). Outline **FIVE** characteristics of good building stones. **(5 Marks)**
- (c). With the aid of a sketch, describe wedge method of quarrying stones. **(7 Marks)**

Question FOUR (20 Marks)

- (a). State **FOUR** properties of cast iron. **(2 Marks)**
- (b). Describe the following methods of heat treatment of carbon steel.
- (i). Hardening
 - (ii). Tempering
 - (iii). Annealing
 - (iv). Normalizing
- (8 Marks)**
- (c). Explain the stages involved in the extraction of pig iron. **(10 Marks)**

Question FIVE (20 Marks)

- (a). Describe the manufacturing process of clay bricks. **(12 Marks)**
- (b). Describe the compressive strength test of brick. **(8 Marks)**