



TECHNICAL UNIVERSITY OF MOMBASA
**Faculty of Engineering &
Technology**

DEPARTMENT OF BUILDING & CIVIL ENGINEERING
DIPLOMA IN BUILDING & CIVIL ENGINEERING (DBCE 14J)

ECV 2101: CIVIL ENGINEERING MATERIALS I

END OF SEMESTER EXAMINATION

SERIES: APRIL 2014

TIME ALLOWED: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer booklet*

This paper consists of **FIVE** questions. Answer any **THREE** questions of the **FIVE** questions

All questions carry equal marks

Maximum marks for each part of a question are as shown
This paper consists of **TWO** printed pages

Question One

- a) Briefly describe the formation of the three geological classes of rocks, giving **THREE** examples of each. **(6 marks)**
- b) With the aid of a graph, describe the behavior of heating and cooling curves of steel. **(7 marks)**
- c) Briefly explain the classification of building stones according to their commercial use. **(7 marks)**

Question Two

- a) Explain the major operations involved in the manufacture of clay bricks. **(10 marks)**
- b) With the aid of a sketch, describe the smelting of iron-ore by blast furnace. **(10 marks)**

Question Three

- a) Explain the characteristics of:
(i) Hard-wood
(ii) Soft-wood, giving three examples of each. **(5 marks)**
- b) State the properties and uses of the following types of glues.
(i) Poly-vinyl acetate
(ii) Melamine formaldehyde **(10 marks)**
- c) State **FIVE** conditions of timber before treatment. **(5 marks)**

Question Four

- a) Briefly explain the following methods of applying timber preservatives:
(i) Full cell (pressure process)
(ii) Open tank hot and cold bath process **(8 marks)**
- b) Using a sketch, briefly describe the artificial kiln method of seasoning timber. **(6 marks)**
- c) Define the following terms as used in metals:
(i) Ductility
(ii) Malleability
(iii) Hardness **(6 marks)**

Question Five

- a) Using a sketch, describe an experiment to determine young's modulus of elasticity for steel. **(5 marks)**
- b) Using sketches, describe the following timber tests:
(i) Hardness tests
(ii) Cleavage tests **(9 marks)**

c) State any THREE heat-treatment to enhance properties of steel.

(6 marks)