



TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF BUILDING & CIVIL ENGINEERING
DIPLOMA IN ARCHITECTURE (DARC 12S)

EAR 2207: MATERIAL SCIENCE I

SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: AUGUST 2016
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

Maximum marks for each part of a question are as shown

This paper consists of **THREE** printed pages

Question One

- a) Define the following terms:
(i) Specific gravity
(ii) Elasticity
(iii) Plasticity
(iv) Ductility
(v) Malleability **(10 marks)**
- b) (i) Briefly describe the TWO commercial classification of timber
(ii) Give TWO examples of trees in each class **(8 marks)**
- c) State TWO reasons for testing materials. **(2 marks)**

Question Two

- a) Outline FOUR factors considered when selecting building materials. **(8 marks)**
- b) State FOUR advantages of timber as a building material. **(4 marks)**
- c) With the aid of a sketch briefly describe air seasoning of timber. **(8 marks)**

Question Three

- a) Outline FOUR causes of decay to natural stones. **(8 marks)**
- b) Differentiate between 'dressing' and quarrying of stones. **(3 marks)**
- c) Briefly describe the geological classification of rocks. **(9 marks)**

Question Four

- a) List FOUR types of Portland cements. **(2 marks)**
- b) State FOUR advantages of concrete. **(4 marks)**
- c) Differentiate between 'plain' and 'reinforced' concrete. **(4 marks)**
- d) Explain the reasons for mix design in concrete. **(6 marks)**
- e) Define the following terms as used in concrete:
(i) Curing
(ii) Batching **(4 marks)**

Question Five

- a) Briefly describe the following metal forming processes:
- (i) Drawing
 - (ii) Extrusion
 - (iii) Rolling
- (6 marks)**
- b) Briefly describe TWO methods of surface protection of ferrous metals. **(6 marks)**
- c) Outline the major operations carried out in manufacture of clay products. **(8 marks)**