

MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

DRAFT EXAMS (JAN-APR).2020

UNIT CODE: ECT3201 : ENGINEERING MATERIALS 1

Instructions: Answer question ONE and any other TWO questions

Question One

- a) Explain the following terms as used in the manufacturing of metal
 - i) Iron ore (2marks)
 - ii) Pig iron (4marks)
 - iii) Cupola furnace (4marks)
- b) Draw and name all the parts of a Typical Blast Furnace (10marks)
- c) Describe the mechanical properties of ceramics (10marks)

Question Two

- a) Describe the following metal properties
 - i) Ultimate Strength (5marks)
 - ii) Stress (5marks)
 - iii) Yield point (4marks)
 - iv) Apiece sample metal of diameter 20mm and 50mm length was subjected to a load of 100 KN at a yield test. The final length at failure was 56mm. Calculate the
 - i) Shear stress (3marks)
 - ii) Degree of elongation (3marks)

Question Three

- a) Define corrosion of metals and explain how it occurs (4marks)
- b) Describe the following four methods of corrosion protection.
 - i) Cathodic protection (4marks)
 - ii) Inhibitors (4marks)
 - iii) Coatings (4marks)
 - iv) Plating (4marks)

Question Four

Describe the following terms as used in Material Engineering

- a) Polymerisation (5marks)
- b) Condensation Polymerisation (5marks)
- c) Depolymerisation (5marks)
- d) Rubbers (5marks)

Question Five

- a) Describe the following classification of rubber. (4marks)
- i) Natural Rubber (4marks)
 - ii) Synthetic Rubber
- b) Describe Ceramics (4marks)
- c) Explain Refractories classification of ceramic (8marks)