



TECHNICAL UNIVERSITY OF MOMBASA

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Faculty of Engineering and Technology  
Department of Electrical & Electronics engineering  
UNIVERSITY EXAMINATION FOR:  
Certificate in Electrical & Electronics Engineering  
EME 1131 : Materials & Processes  
END OF SEMESTER EXAMINATION  
SERIES: AUGUST 2019  
TIME: 2 HOURS  
DATE: Pick Date Aug 2019

**Instruction to Candidates:**

You should have the following for this examination

- *Student I.D. Card & Examination Pass*
- *Answer booklet*
- *Non-Programmable scientific calculator*

This paper consists of **FIVE** questions. Attempt question **ONE** and any other **TWO** questions.

Maximum marks for each part of a question are as shown.

**Do not write on the question paper.**

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**Question ONE**

- Distinguish between Ferrous and Non-Ferrous Materials giving two examples of each. **(8 marks)**
- Name five methods used in the production of Mild Steel. **(5 marks)**
- With the aid of diagrams, describe three methods used in the production of Steel mentioned in (b) above. **(15 marks)**
- Give Two Applications of Medium Carbon Steel **(2 marks)**

**Question TWO**

- With the aid of Diagrams describe the following: **(8 marks)**
  - Annealing
  - Normalizing
  - Hardening

- iv. Tempering
- b) Describe the following types of Cast Iron: **(6 marks)**
  - i. Gray Cast Iron
  - ii. White Cast Iron
- c) Define the following Properties: **(6 marks)**
  - i. Hardness
  - ii. Ductility
  - iii. Brittleness

### **Question THREE**

- a) Define the term 'Tensile load' **(2 marks)**
- b) Sketch a graph of Stress against Strain for a ductile material undergoing a Tensile Test. **(6 marks)**
- c) Label the points of the Stress/Strain graph in (b) above. **(4 marks)**
- d) State the Importance of the Points Labeled in (c) above. **(3 marks)**
- e) With the aid of diagrams, describe the Heat Treatment of Plain Carbon Steels. **(5 marks)**

### **Question FOUR**

- a) Define the following terms: **(6 marks)**
  - i. Forging
  - ii. Drifting
  - iii. Swaging
  - iv. Punching
  - v. Fullering
  - vi. Flattering
- b) Make neat sketches of the hand forging tools used in (a) above. **(12 marks)**
- c) Explain the difference between upsetting and flattening. **(2 marks)**

### **Question FIVE**

- a) Define the terms: **(6 marks)**
  - i. Conductor
  - ii. Semi-conductor
  - iii. Insulator
- b) Give two examples each of materials which fall under (i), (ii) and (iii) in (a) above. **(6 marks)**
- c) Distinguish between thermoplastics and thermosetting Plastics giving three examples in each case. **(4 marks)**
- d) Briefly outline the role played by plastics in the Electronics Industry. **(4 marks)**