



# TECHNICAL UNIVERSITY OF MOMBASA

*Faculty of Engineering and Technology*

## DEPARTMENT OF MECHANICAL AND AUTOMOTIVE ENGINEERING

DIPLOMA IN MECHANICAL ENGINEERING

### EME 2101 WORKSHOP TECHNOLOGY AND PRACTICE I

END OF SEMESTER EXAMINATIONS

YEAR 1 SEMESTER 1

**SERIES:** DECEMBER, 2013

**TIME:** 2 HOURS

#### **INSTRUCTIONS TO CANDIDATES:**

1. You should have the following for this examination:
  - Answer Booklet
  - Drawing Instruments
  - Scientific Calculator
2. This paper consists of **FIVE** Questions.
3. Answer Question **ONE** any other **TWO** Questions.
4. All Questions carry equal marks.
5. **This paper consists of THREE printed pages.**

Question ONE

- (a) State and explain any **FIVE** general safety precautions to be observed in the workshops to avoid hazards. **(5 marks)**
- (b) Explain any **FIVE** main causes of Accidents and their remedies. **(5 marks)**
- (c) Describe how a victim of an electric shock can be rescued and treated before seeking specialized medical treatment. **(4 marks)**
- (d) (i) State and explain the **THREE** essentials to start a fire.  
(ii) State any **THREE** classes of fires and explain their suitable extinguishers. **(6 marks)**

### Question TWO

- (a) (i) Describe with reasons what governs the choice of a tool for measuring and marking out. **(8 marks)**  
(ii) Describe using neat sketches **SIX** common marking out and measuring tools in their applications.
- (b) Use a neat sketch to show a metric micrometer set to read 9.66mm that moves a spindle and has a pitch of 0.5mm. **(6 marks)**
- (c) For a metric vernier caliper having a main scale divisions spaced at 0.5mm apart, show and explain a reading of 31.68mm to an accuracy of 0.02mm. **(6 marks)**

### Question THREE

- (a) (i) State any **TWO** types of circular dies and discuss any **ONE** type.  
(ii) Explain the operations and sequence followed when hand tapping in the workshop.  
(iii) State any **THREE** important precautions to be observed when cutting threads. **(10 marks)**
- (b) (i) Describe the term “Drawfiling” and state it’s purpose.  
(ii) With the aid of neat sketches describe **TWO** common grades of cut. **(6 marks)**
- (c) (i) Explain the importance of pitch when selecting a hacksaw blade.  
(ii) Describe how a hacksaw blade is mounted on its frame. **(4 marks)**

### Question FOUR

- (a) (i) Differentiate between Drilling and Boring.  
(ii) Explain the importance of centre drilling before the main drilling operation.  
(iii) Sketch any **TWO** types of centre drills used in training institution workshops. **(8 marks)**
- (b) With the aid of neat sketches explain the following operations carried out on the drilling machine:  
  
(i) Counter sinking  
(ii) Counter boring  
(iii) Spot facing **(6 marks)**
- (c) (i) Sketch and label any **THREE** parts of a parallel shank twist drill.  
(ii) State the functions of the labeled parts in c(i). **(6 marks)**

#### **Question FIVE**

- (a) Describe the stages involved in sheet metal work and state any **FOUR** common sheet metal materials. **(4 marks)**
- (b) With the aid of neat sketches explain any **FOUR** of the following sheet metal tools and equipments:  
  
(i) Hand shears  
(ii) Stakes  
(iii) Mallets  
(iv) Hammers  
(v) Folding bar **(8 marks)**
- (c) (i) Differentiate between soft soldering and hard soldering/brazing.  
(ii) State **TWO** uses of fluxes in soldering.  
(iii) Sketch and explain any **TWO** common types of oxy-fuel flames. **(8 marks)**