



# **MACHAKOS UNIVERSITY**

**University Examinations for 2016/2017**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**DEPARTMENT OF MECHANICAL AND MANUFACTURING ENGINEERING**

**FIRST YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF  
BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING**

**SUPPLEMENTARY EXAMINATION**

**EMM 104: MECHANICAL WORKSHOP PROCESSES AND PRACTICES I**

**DATE:**

**TIME:**

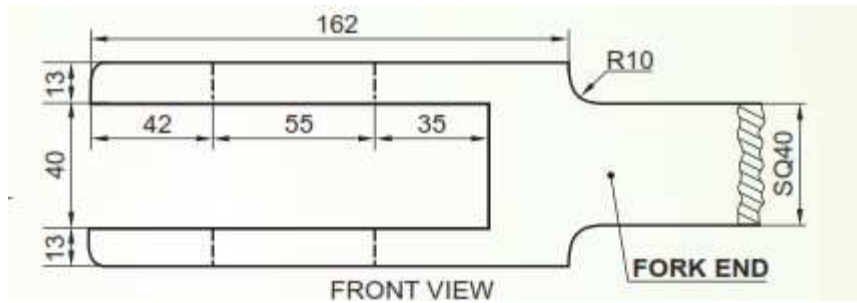
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## **INSTRUCTIONS:**

- **ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS**
- **ANY UNAUTHORIZED MATERIALS NOT ALLOWED IN EXAM ROOM**

### **QUESTION ONE- 30 MARKS (COMPULSORY)**

- a) Explain the duties of employer and employees regarding safety in workshop (3 marks)
- b) The component below is to be fabricated in the workshops out of a flat bar work piece of the dimension 20mm by 80mm by 200 mm length.



- i. Outline the hand five tools required
- ii. Specify the safety precaution to be adhered to when using the above hand tools
- iii. Explain the procedure required to fabricate this component (12 marks)
- c) Describe three causes of accident in the workshop (6 marks)
- d) Describe electrical safety measures needed to be put in place in workshop (9 marks)

### QUESTION TWO- 20 MARKS

- a) Explain three types of fire extinguisher (6 marks)
- b) Using sketch show the following reading
  - i. 40.22 mm in vernier scale
  - ii. 123.12mm in vernier scale
  - iii. 9.44mm in micrometer scale
  - iv. 16.77 mm in micrometer scale (8 marks)
- c) Using well labeled sketch explain the working principle of a vernier caliper (6 marks)

### QUESTION THREE- 20 MARKS

- a) Explain the term datum and sketch how it is created in the work piece (3 marks)
- b) Describe the working principles of surface gauge (8 marks)
- c) Describe how the following tools are used in marking out
  - i. micrometer
  - ii. square head
  - iii. Vernier Height gauge (9 marks)

**QUESTION FOUR- 20 MARKS**

- a) Explain the functions of three types of sheet metal (6 marks)
- b) Describe the following terms
  - i. Snips
  - ii. Planishing hammer
  - iii. Groove seam
  - iv. tapping (9 marks)
- c) Explain the following
  - i. Double seam
  - ii. notches
  - iii. Locked seam joints (6 marks)

**QUESTION FIVE- 20 MARKS**

- a) Differentiate between brazing and soldering process (6 marks)
- b) Explain why fluxes are required when soldering and outline three types (5 marks)
- c) Describe the procedures followed when carrying out soldering operation (9 marks)