



MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL AND MANUFACTURING ENGINEERING

FIRST YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

EMM 104: MECHANICAL WORKSHOP PROCESSES AND PRACTICES I

DATE: 16/12/2020

TIME: 8.30-10.30 AM

INSTRUCTIONS

- ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS) (COMPULSORY)

- Explain the duties of employer regarding safety in workshop (3 marks)
- The fork end in figure 1 is to be fabricated in the workshops out of a flat bar work piece of the dimension 20mm by 80mm by 200 mm length.

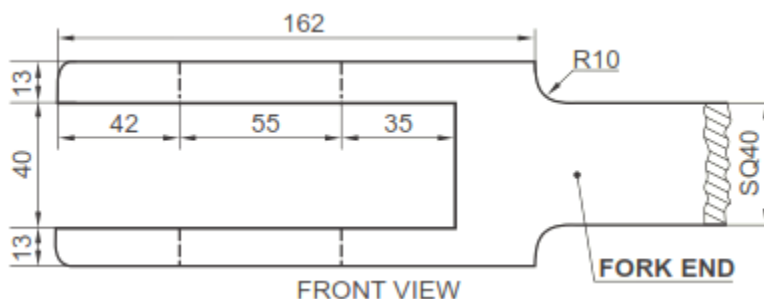


Figure 1 ; fork end

- Outline the five hand tools required (2 marks)
 - Specify the four-safety precaution to be adhered to when using the above hand tools (2 marks)
 - Explain the procedure required to fabricate this component (10 marks)
 - Explain how squariness and flatness is checked in the fabricated component (4 marks)
- Describe three causes of accident in the 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 (2 marks)
 - ii. 123.12mm in vernier scale (2 marks)
 - iii. 9.44mm in micrometer scale (2 marks)
 - iv. 16.77 mm in micrometer scale (2 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 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. V- block (3 marks)
 - ii. Square head (3 marks)
 - iii. Vernier Height gauge (3 marks)

QUESTION FOUR (20 MARKS)

- a) Table 2 show the slip gauges available.

Range	Step	Pieces
1.001 to 1.009	0.001	9
1.01 to 1.49	0.01	49
0.5 to 9.5	0.5	19
10 to 90	10	9
Total		86

Build up the following measurement

- i. 56.421mm (3 marks)
 - ii. 78.748mm (3 marks)
 - iii. 5.345mm (3 marks)
- b) Explain the following
- i. Double seam (2 marks)
 - ii. Notches (2 marks)

- iii. Locked seam joints (2 marks)
- c) Describe how concentricity of a shafts is checked in the workshop (5 marks)

QUESTION FIVE (20 MARKS)

- a) Differentiate between brazing and soldering process (6 marks)
- b) Describe the following
 - i. Surface table (2 marks)
 - ii. Angle plate (2 marks)
 - iii. Vernier height gauge (2 marks)
- c) Describe the procedures followed when soldering (8 marks)