



MACHAKOS UNIVERSITY
SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF MECHANICAL AND MANUFACTURING ENGINEERING
SECOND YEAR FIRST SEMESTER EXAMINATION FOR
BACHELOR OF SCIENCE IN MECHANICAL AND MANUFACTURING
ENGINEERING
EMM 213 - WORKSHOP PROCESSES I

DATE:

TIME:

INSTRUCTIONS:

ANSWER YOUR QUESTIONS IN ANSWER BOOKLET PROVIDED

ANSWER QUESTION ONE [COMPULSORY] AND ANY OTHER TWO QUESTIONS.

QUESTION ONE (30MARKS)

- a) What are the Employer's responsibilities under the HSWA? **(4marks)**
- b) Define Limits. **(2marks)**
- c) Why study Limits & Fits? **(2marks)**
- d) Explain three causes of accidents in the workshop **(6marks)**
- e) With aid of sketches, describe the following types of files. **(8marks)**
 - i. Pillar file
 - ii. Flat file
 - iii. Square file
 - iv. Three-square file
 - v. Round file
- f) Explain the working principle of **(8marks)**
 - i. Snap gauges
 - ii. Plug gauges
 - iii. Taper gauges
 - iv. Telescopic gauges

QUESTION TWO (20MARKS)

- a) Explain how to build angles of 33^0 and 27^0 given the angle gauge block set shown below. **(5marks)**
- i. six blocks in degrees – 1, 3, 5, 15, 30 and 45;
 - ii. five blocks in minutes – 1, 3, 5, 20 and 30;
 - iii. five blocks in seconds – 1, 3, 5, 20 and 30.
- b) Explain the functions of the following workshop tools. **(10marks)**
- i. Jacks and wedges
 - ii. Vee blocks
 - iii. Engineer's square
 - iv. Marking dye
 - v. Scriber
- c) Explain the process of determining the gauge blocks required for a size of 78.748 mm using the M88/2 set shown in the table below. **(5marks)**

Size (mm)	Increment (mm)	Number of pieces
1.0005	–	1
2.001 to 2.009	0.001	9
2.01 to 2.49	0.01	49
0.5 to 9.5	0.5	19
10 to 100	10	10
		Total 88 pieces

QUESTION THREE (20MARKS)

- a) With aid of a sketch, explain how to use a sine bar and hence demonstrate how an angle of inclination of an object can be measured. **(8marks)**
- b) Show on a Vernier scale a reading of 40.22 mm and 123.12 mm. **(6marks)**
- c) Show on a micrometer a reading of 9.44 mm and 16.77 mm **(6marks)**

QUESTION FOUR (20MARKS)

- a) State the meanings of the following terms. **(7marks)**
- i. *Tolerance*
 - ii. *Mean size*
 - iii. *Limits of size*
 - iv. *Maximum limit of size*
 - v. *Minimum limit of size*
- b) Explain how to remove a section from the centre of a plate, using a chisel. **(7marks)**
- c) Describe how concentricity of a shaft is checked in the workshop. **(6marks)**

QUESTION FIVE (20MARKS)

- a) What considerations should be made in designing a soft soldered joint? **(6marks)**
- b) State the purpose of using a flux during a brazing operation. **(2marks)**
- c) Describe the following **(7marks)**
- i. Blind rivets
 - ii. Solid and tubular rivets
- d) With aid of sketches, explain ways in which joint designs can be improved when soldering **(5marks)**