MACHAKOS UNIVERSITY

University Examinations for 2022/2023

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL AND MANUFACTURING ENGINEERING
SECOND YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (MECHANICAL 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 (COMPULSORY) (30 MARKS)

a) What are the Employer's responsibilities under the HSWA? (5 marks)

b) Define Limits. (2 marks)

c) Why study Limits & Fits? (3 marks)

d) Explain file identification. (4 marks)

e) With aid of sketches, describe the following types of files. (8 marks)

i. Pillar file
ii. Flat file
iii. Square file
iv. Three-square file
v. Round file

f) Explain the process of wringing gauge bocks (8 marks)

QUESTION TWO (20MARKS)

a) Explain how to build angles of 33^0 and 27^0 given the angle gauge block set shown below. (5 marks)

- six blocks in degrees - 1, 3, 5, 15, 30 and 45;

- five blocks in minutes – 1, 3, 5, 20 and 30;
- five blocks in seconds – 1, 3, 5, 20 and 30.

b) Explain the functions of the following workshop tools. (10 marks)

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. (5 marks)

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. (8 marks)

b) Show on a Vernier scale a reading of 40.22 mm and 123.12 mm. (6 marks)

c) Show on a micrometer a reading of 9.44 mm and 16.77 mm (6 marks)

QUESTION FOUR (20MARKS)

a) State the meanings of the following terms. (7 marks)

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. (8 marks)

c) List the DOs and DON'Ts when using a vernier caliper (5 marks)

QUESTION FIVE (20MARKS)

a) What considerations should be made in designing a soft soldered joint? (6 marks)

b) State the purpose of using a flux during a brazing operation. (2 marks)

c) With aid of a sketch, explain blind/pop rivets. (7 marks)

d) With aid of sketches, explain ways in which joint designs can be improved when soldering (5 marks)