



MACHAKOS UNIVERSITY
SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF MECHANICAL & MANUFACTURING
ENGINEERING

FIRST YEAR SECOND SEMESTER EXAMINATION FOR DIPLOMA IN
ELECTRICAL & ELECTRONICS ENGINEERING
(POWER & TELECOMMUNICATION OPTIONS)

MODULE I

2601/2602/104 MATERIALS PROCESSES & WORKSHOP TECHNOLOGY

INSTRUCTIONS

TIME: 2hrs

Answer ALL questions in this paper

1. a) What is an accident? Describe briefly **four** common causes and sources of accidents.

(5 marks)

- c) Describe briefly **Four** general provisions of factories act 1948, regarding safety.

(4 marks)

- d) Explain how fire can be prevented in industries.

(4 marks)

- e) Draw and name **six** major parts of the vernier caliper

(7 marks)

2. a) Using line diagram show the following readings on;

- Micrometer screw gauge

i. 5.33 mm

ii. 1.54 mm

- Vernier caliper

i. 12.96 mm

ii. 0.68 mm

(8 marks)

- b) Describe any **four** toxic substances in a workshop.

(4 marks)

- c) Explain the **four** safety colours giving an example of where they can be used. (8 marks)
3. a) Describe the following tools using sketches;
- i. Engineer's square
 - ii. Scribing block
 - iii. Angle plate
 - iv. odd leg caliper (8 marks)
- b) Using sketches describe:
- i. Cross Filing;
 - ii. Draw Filing (6 marks)
- c) With the aid of a well labelled diagram explain the production of aluminium (6 marks)
4. a) Highlight **FOUR** types iron ores stating the % of iron contained (4 marks)
- b) Using sketches explain the following hand tools;
- i. anvil
 - ii. hack saw
 - iii. swage block (9 marks)
- c) Explain **Two** safety measures each in regard to the following;
- i. Fires
 - ii. Electric shocks (4marks)
- d) Describe **Three** safety precautions to be observed when using chisels at the bench. (3 marks)
5. a) Using sketches describe Upsetting (5 marks)
- b) Describe the following properties of materials
- i) Hardness
 - ii) Tensile strength
 - iii) Plasticity
 - iv) Malleability

- v) Brittleness (10 marks)
- b) Describe swaging process using sketches. (5 marks)