



TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering and Technology
Department of Mechanical & Automotive Engineering
UNIVERSITY EXAMINATION FOR:
Diploma in Mechanical Engineering (Y1S1)
EME 2101 : Workshop Technology & Practice (Paper 2)
SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: SEPTEMBER 2018
TIME: 2 HOURS
DATE: Sep 2018

Instruction to Candidates:

You should have the following for this examination

- *Examination Pass & Student ID Card*
- *Answer booklet*
- *Non-Programmable scientific calculator*

This paper consists of **FIVE** questions. Attempt any **THREE** questions.

Maximum marks for each part of a question are as shown.

Do not write on the question paper.

Question ONE

- a) **(10 marks)**
- Clearly discuss any FIVE specific precautions to be observed in the mechanical workshops, in order to avoid Hazards.
 - Outline any FIVE duties and obligations stipulated in (OSHA) Act 2007.
- b) **(10 marks)**
- State any THREE safety hazards giving ONE way of preventing each of them occurring.
 - Describe with the aid of a sketch the THREE main essential elements always present to start a fire.
 - State FOUR classes of fires and one appropriate extinguisher for each class.

Question TWO

- a) (12 marks)
- i. Using suitable sketches describe any THREE of the following measuring tools and the accuracy for each one discussed.
 - I. Rule
 - II. Calipers
 - III. Tape measure
 - IV. Vernier calipers
 - ii. Illustrate with a neat sketch how a metric Vernier caliper is read.
- b) (8 marks)
- i. With the aid of neat sketches show the THREE possible ways how measurement units, can be placed on drawings.
 - ii. Define tolerance and state the upper and lower limits of a shaft which diameter is stated as $48.00 \pm 0.15\text{mm}$.
 - iii. Explain the term Interference Fit.

Question THREE

- a) (8 marks)
- i. State clearly any FOUR main reasons for marking out any component during production work.
 - ii. Describe using illustrations FOUR main datum references that measurements must start from.
- b) (8 marks)
- i. Sketch any FOUR common marking out tools and equipment's used for engineering purposes.
 - ii. Describe using illustrations the trammel and its purpose as a marking tool.
- c) State any FOUR common tools used in conjunction with a surface plate or table and explain any TWO flatness checking methods. (4 marks)

Question FOUR

- a) (10 marks)
- i. Sketch and discuss any FOUR main metal work hand tools used by craftsmen and their materials of construction.
 - ii. Differentiate the purpose between cross filing and draw filing operations.
- b) (10 marks)
- i. Describe using a sketch the use and function of the engineers file and explain the various grades available to a craftsman.

- ii. Describe the procedure and sequence of fitting and fastening hacksaw blade in a suitable frame.

Question FIVE

a) **(10 marks)**

- i. Describe the various stages involved in sheet metal work and state any FOUR common sheet metal materials.
- ii. Differentiate between soft soldering and brazing.
- iii. State the TWO types of fluxes and TWO reason for using such Fluxes.

b) **(10 marks)**

- i. State any FOUR major work holding devices and their degrees of freedom that they restrain.
- ii. Describe any TWO types of drilling machines.
- iii. Describe with remedies any THREE causes of drill failure.