



TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering and Technology

DEPARTMENT OF MECHANICAL AND AUTOMOTIVE ENGINEERING
UNIVERSITY EXAMINATION FOR:

DIPLOMA IN MARINE ENGINEERING (DMAE 1)
EMR 2104 WORKSHOP TECHNOLOGY AND PRACTICE I
END OF SEMESTER EXAMINATION

SERIES: DEC 2016 PAPER-B

TIME: 2 HOURS

DATE: 2016

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of Choose No questions. Attempt Choose instruction.

Do not write on the question paper.

Question ONE

- a) State any **FIVE** safety precautions to be observed when undertaking repairs in a ship (5mks)
- b) Use sketches to differentiate between the following workshop tools
- i. Engineers ball pane hammer and a claw hammer
 - ii. An anvil and a swage block
 - iii. A flat file and hand file
 - iv. A leg vice and a hand vice (8 marks)
- c) Outline the procedure for cutting the following threads on the bench
- i) Internal
 - ii) External (7 marks)

Question TWO

- a) Differentiate between the following fundamental properties of metals:
- i. Hardness and toughness
 - ii. Ductility and malleability
 - iii. Fusibility and elasticity (9mks)
- b) Define the following heat treatment processes
- i. Annealing
 - ii. Normalizing
 - iii. Tempering (6mks)
- d) State any **FOUR** main sources of water and describe any **TWO** sources of water contamination (5mks)

(6 marks)

Question Three

- a) Define the term grinding (2mks)
- b) Use sketches to describe the following:
- i. Grit and bond
 - ii. Wheel balancing
 - iii. Huntington wheel dressing tool
 - iv. The bench grinder (12 marks)
- c) State any **TWO** methods of correcting any wheel imbalance (2mks)
- d) List any **FOUR** safety requirements when working on the grinding wheel (4mks)

Question Four

- a) List any **FIVE** safety precautions to be observed when using a micrometer screw gauge (5mks)
- b) Sketch a well labeled diagram of an internal micrometer (3mks)
- c) Indicate the following readings on a micrometer screw gauge scale:
- i. 19.98mm
 - ii. 0.67mm
 - iii. 10.24mm (4 marks)

d) Illustrate the difference between the inside and the outside calipers (4mks)

e) Sketch a labeled diagram of a Vernier caliper and outline the procedure of taking a reading on the Vernier caliper (4mks)

Question Five

a) Describe the riveting process (3mks)

b) Use sketches to differentiate between the following

- i. Flat and snap head rivets
- ii. Countersunk and counter bore rivet heads
- iii. Lap joint and plated butt joint
- iv. An anvil and a swage block (10 marks)

c) State any **TWO** functions of a coolant when cutting using the power saw (2mks)

d) Describe with a labeled diagram the operation of a powered hacksaw (5 marks)