



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) Explain the following operations of metal joining
- i. Riveting
 - ii. Tapping (2mks)
- b) Sketch the following riveted joints
- i. Single-riveted lap
 - ii. Double- riveted lap
 - iii. Single-strap butt (6mks)
- c) Use sketches to differentiate between the following rivet heads
- i. Flat head and mushroom head
 - ii. Pan head and countersunk head (4mks)
- d) Describe the following hand processes and sketch the tools used
- i. External thread cutting
 - ii. Internal thread cutting (8mks)

Question Two

- a) Explain the need for safety gear when working in the marine industry (2mks)
- b) Marine engineering students were supposed to drill a 25mm diameter hole. They started off with a 10mm pilot drill before using the 25mm drill to finish the hole. However they encountered the following problems with the available twist drill; Worn out corners of the cutting edge and drill breakages

- i. State **TWO** reasons for using the pilot drill (2mks)
- ii. List **TWO** causes and **TWO** remedies for each of the above problems encountered (4mks)
- c) State any **THREE** main sources of water (3mks)
- d) Differentiate between the following fundamental properties of metals
 - i. Hardness and toughness
 - ii. Ductility and malleability
 - iii. Fusibility and plasticity (9mks)

Question Three

- a) Use sketches to differentiate between
 - i. An internal micrometer and a depth micrometer
 - ii. An inside and an outside caliper (8mks)
- b) Illustrate the following readings on a Vernier scale
 - i. 17.72mm
 - ii. 12.66mm
 - iii. 0.40mm (6mks)
- c) State any **THREE** safety precautions to be observed when using
 - i. Vernier caliper
 - ii. The micrometer screw gauge (6mks)

Question FOUR

- a) Define the term wheel dressing as used in grinding (2mks)
- b) Explain how the wheel dressing is carried out using the Huntington dressing tool (2mks)
- c) Sketch and label the major parts of a bench grinder (5mks)
- d) Differentiate between a parallel shank twist drill and a Morse tapered shank twist drill
(4mks)
- e) Sketch and label **FIVE** main parts of a parallel shank twist drill (7mks)

Question FIVE

- a) State any **FIVE** safety precautions to be observed when filing (5mks)
- b) Use sketches to differentiate between the following hand tools
 - i. A hand file and a flat file
 - ii. A cross cut and a diamond point chisel
 - iii. An adjustable hacksaw flame and a fixed hacksaw flame (9mks)
- c) Explain using sketches the following processes with respect to hand cutting tools:
 - i. Draw filing
 - ii. Pining
 - iii. Cross filing (6mks)

