



TECHNICAL UNIVERSITY OF MOMBASA

**Faculty of Engineering and Technology
Department of Mechanical & Automotive Engineering
UNIVERSITY EXAMINATION FOR:
Diploma in Marine Engineering
EMR 2213: Engineering Drawing & Design II
SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: AUGUST 2019
TIME: 2 HOURS**

Instruction to Candidates:

You should have the following for this examination

- *Answer booklet*
- *Non-Programmable scientific calculator*
- *Drawing Instruments*
- *A3 drawing paper*

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) Explain the term standardization. **(3 marks)**
- b) Mention any six key benefits of standards. **(6 marks)**
- c) State any SIX ISO standards used in engineering design. **(6 marks)**
- d) State the application of each of the following engineering drawings; **(5 marks)**
- Layout drawing
 - Assembly drawing
 - Schematic drawing
 - Installation drawing
 - Modification drawing

Question TWO

- a) Draw a well labeled schematic diagram of a steam boiler system with a complete parts list and explain how it works. **(10 marks)**
- b) State the color coding the following piping system services; **(5 marks)**
- Sea water
 - Compressed air
 - Fresh water
 - Fire fighting
 - Hydraulic oil
 - Engine fuel
- c) Sketch the schematic diagrams for the following equipment; **(5 marks)**
- Boiler
 - Heat exchanger
 - Pump
 - Compressor
 - Reservoir

Question THREE

- a) Explain the steps to be followed in engineering design process. **(10 marks)**
- b) Explain the following Data sampling methods stating an example for each;
- Stratified
 - Cluster
 - Random
 - Judgemental
 - Systematic
- (10 marks)**

Question FOUR

- a) Draw the following types of screw threads: **(8 marks)**
- ACME
 - Buttress
 - Square
 - V shaped
- b) Draw the cam profile for following conditions:
- Follower type = Knife edged, in-line; lift = 50 mm; base circle radius = 50 mm; out stroke with SHM, for 600 cam rotation; dwell for 450 cam rotation; return stroke with SHM, for 900 cam rotation; dwell for the remaining period.
- (14 marks)**

Question FIVE

- a) Explain any FIVE classifications of bearings stating an example for each application
(10 marks)
- b) Using sketches, show the following fits for a male and female member:
i. Interference
ii. Transition
iii. Clearance
(6 marks)
- c) State any four benefits of Limits and fits standard systems.
(4 marks)