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
END OF SEMESTER EXAMINATION
SERIES: AUGUST 2019
TIME: 2 HOURS

<u>**Instruction to Candidates:**</u>
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) Describe and state the application of each of the following engineering drawings;
    i. Assembly drawing
    ii. Detailed drawing
    iii. Parts drawing
    iv. Production drawing
    v. Exploded drawing   **(10 marks)**
b) Explain the steps to be followed when preparing a bill of quantities.   **(5 marks)**
c) State the color coding the following piping system services;   **(5 marks)**
    i. Sea water
    ii. Compressed air
    iii. Fresh water
    iv. Fire fighting
    v. Hydraulic oil

    vi. Engine fuel

   vii. Steam line

  viii. Electricity conduit

    ix. Telecommunication conduits

     x. Sewage

Question TWO

a) Sketch the schematic diagrams for the following equipment;   **(5 marks)**

     i. Boiler

    ii. Turbine

   iii. Pump

   iv. Condenser

    v. Reservoir

b) Draw a well labeled schematic diagram of a marine steering system with a complete parts list and explain how it works.   **(15 marks)**

Question THREE

a) Explain the steps to be followed in engineering design process.   **(10 marks)**

b) Explain the types and methods of the following;   **(10 marks)**

     i. Data Collection

    ii. Data Sampling

   iii. Data Analysis

   iv. Data Presentation

Question FOUR

a) Sketch 3 types of cams based on the type of follower classification method. **(6 marks)**

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

Explain any three classifications of the following machine elements, giving two types of each and stating an application for each:

a) Gears

b) Bearings

c) Threaded fasteners

        (20 marks)