



TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering and Technology
Department of Mechanical & Automotive Engineering
UNIVERSITY EXAMINATION FOR:
Diploma in Marine Engineering
EMR 2212 : General Marine Engineering Knowledge II
END OF SEMESTER EXAMINATION
SERIES: AUGUST 2019
TIME: 2 HOURS
DATE: Pick Date Aug 2019

Instruction to Candidates:

You should have the following for this examination

- *Student I.D. Card & Examination Pass*
- *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

- Define the term propeller (1 marks)
- Briefly explain the working principle of a propeller (4 marks)
- Illustrate a oil lubricated stern tube bearing (6 marks)
- With aid of a neat sketch explain the procedure of shaft alignment by Optical sight line method (9 marks)

Question TWO

- Outline **TWO** principle system of a steering gear. (2marks)
- With the aid of a neat sketch explain the working principles of the RAM (Rapson Slide Actuators/ cylinder) type (8 marks)
- Explain the **THREE** types of controls in steering gears. (9marks)

Question THREE

- a) Explain the purpose of each of the following ship auxiliary system
- i. Bilge water system;
 - ii. Ballast water system. **(2 marks)**
- b) With respect to pollution prevention equipment:
- i. Outline the FOUR types of sewage plant;
 - ii. Illustrate a typical biological sewage treatment plant. **(10 marks)**
- c) Outline TWO causes and TWO actions in each of the following defects in marine oily water separator system:
- i. Water in oil discharge;
 - ii. High pressure in separator. **(8 marks)**

Question FOUR

- a) outline the FOUR originals certificates and endorsements you should carry as board STCW requirements **(4 marks)**
- b) state the THREE specific cases listed in the STCW convention in which penalties are to be applied **(6 marks)**
- c) explain the following mandatory safety, security and ship- board familiarization training
- i. Basic safety familiarization;
 - ii. Ship-specific familiarization;
 - iii. Security familiarization. **(10 marks)**

Question FIVE

- a) Explain the following principles of corrosion:
- i. Direct chemical attack;
 - ii. Electro-chemical action. **(4 marks)**
- b) Briefly explain each of the following form of corrosive attack found in feed systems:
- i. Graphitization;
 - ii. De-zincification;
 - iii. Exfoliation. **(6 marks)**
- c) Briefly explain each of the following methods of corrosion control:
- i. Paints;
 - ii. cathodic protection;
 - iii. Impressed current cathodic protection. **(10 marks)**