



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
SPECIAL/ SUPPLEMENTARY 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

- a) Outline the THREE types of marine sealing **(3 marks)**
- b) Explain in (a) above each type of marine sealing **(6 marks)**
- c) Explain the following term as used in propeller
- i. Trailing edge;
 - ii. Pitch;
 - iii. Screw. **(3 marks)**
- d) Illustrate with a sketch stuffing box as applicable to propeller **(8 marks)**

Question TWO

- a) Briefly explain the following Common Problems Found in Steering Gear System of Ships:
- i. Unsatisfactory Steering;
 - ii. Rudder Movement is within or Beyond the Limit;
 - iii. No Steering from Remote control. **(6 marks)**

- b) Illustrate a Block diagram of steering gear of a ship. (5 marks)
c) With aid of a neat sketch, briefly explain the operation of a hunting gear. (9 marks)

Question THREE

- a) Outline the main components of each of the following ship auxiliary system
i. Bilge water system;
ii. Ballast water system. (3 marks)
- b) Illustrate a typical oil water separator system (9 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) 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)

Question FIVE

- a) Outline FIVE watch keeping duties of an engineer at sea in charge of a marine diesel engine. (5 marks)
- b) Illustrate a typical marine diesel engine control station board located in the engine room. (9 marks)
- c) With reference to watch keeping on board ships, state what are recommended of
i. Heavy fuel-oil system;
ii. Lube-oil system;
iii. Jacket cooling system. (6 marks)