



**TECHNICAL UNIVERSITY OF MOMBASA**  
***Faculty of Engineering & Technology***

DEPARTMENT OF MECHANICAL AND AUTOMOTIVE ENGINEERING

DIPLOMA IN MARINE ENGINEERING  
(DMAE IV)

**EMR 2218: GENERAL ENGINEERING KNOWLEDGE II**

END OF SEMESTER EXAMINATIONS

**SERIES:** APRIL 2015

**TIME:** 2 HOURS

**INSTRUCTIONS:**

- This paper consists of **FIVE** questions.
- Section **A** is **Compulsory**. Answer **ONE** question from Section **B** and **ONE** question from Section C.
- Do not write on the question paper

***This paper consists of Three printed pages.***

## SECTION A (Compulsory)

### QUESTION 1

- a) Explain the step by step procedure to be followed aboard a passenger ship during evacuation in a emergency situation. **(10 marks)**
- b) i) State any **FOUR** control tests performed before sailing out and before arrival at a port.  
ii) State **SIX** steering gear rules as per maritime organization (IMO) convention and regulation. **(10 marks)**

## SECTION B (MARINE ENGINEERING KNOWLEDGE)

### QUESTION 2

- a) Explain the procedure for the following shaft alignment methods; using sketches:  
i) Angular alignment  
ii) Offset alignment **(8 marks)**
- b) Explain any **FOUR** causes of shaft mis-alignment in marine vessels and how they can be mitigated/controlled. **(12 marks)**

### QUESTION 3

- a) Describe any **FOUR** types of marine steering systems and their working principles giving an example of a vessel using it for each type. **(12 marks)**
- b) Explain the operating principles and the importance of the following components in an automatic steering system:  
i) Receiver  
ii) Transmitter  
iii) Amplifier  
iv) Control unit. **(8 marks)**

## SECTION C

### QUESTION 4

- a) Explain how Fire prevention and protection can be enhanced on-board a marine vessel. **(10 marks)**
- b) Statutory regulation governing the operation of a boiler. **(4 marks)**
- c) State **FIVE** tests carried out on a boiler and their respective importance. **(6 marks)**

## QUESTION 5

- a) Explain with aid of a diagram the working principles of central air condition. **(10 marks)**
- b) State the functions of the following in an refrigeration:
- i) Compressor
  - ii) Condenser
  - iii) Evaporator
  - iv) Expansion valve** **(4 marks)**