



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

DEPARTMENT OF MECHANICAL & AUTOMOTIVE ENGINEERING  
**DIPLOMA IN NAUTICAL STUDIES**

ENS 2207: SHIP CONSTRUCTION & STABILIGY II

**END OF SEMESTER EXAMINATION**

**SERIES: DECEMBER 2014**  
**TIME ALLOWED: 2 HOURS**

**Instructions to Candidates:**

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions. Answer any **THREE** questions of the **FIVE** questions

All questions carry equal marks

Maximum marks for each part of a question are as shown

Use neat, large and well labeled diagrams where required  
This paper consists of **THREE** printed pages

### Question One

- a) Differentiate between the following pumping systems in a typical ship: **(9 marks)**  
(i) Bilge piping system  
(ii) Fire main arrangement system  
(iii) Ballast pumping system
- b) With the aid of a block diagram, explain the working principle of a steering gear of a ship **(11 marks)**

### Question Two

- a) Define the following terms as used in ship stress system:  
(i) Pounding  
(ii) Racking  
(iii) Slamming  
(iv) Painting **(8 marks)**
- b) With the aid of sketches, explain how each of the following ship stresses are caused. **(12 marks)**  
(i) Hogging  
(ii) Sagging  
(iii) Pounding **(12 marks)**

### Question Three

- a) List any FIVE metal alloys used in ship construction **(5 marks)**
- b) Explain FIVE factors that influence the choice of steel in ship construction **(5 marks)**
- c) With the aid of sketches, differentiate between the following types of steel sections used in ship construction:  
(i) Flat plate  
(ii) Offset  
(iii) Bulb  
(iv) Channel  
(v) Tee **(10 marks)**

### Question Four

- a) Sketch the floor plan for the following types of ships:  
(i) Forward perpendicular  
(ii) Length overall  
(iii) Beam  
(iv) Draught  
(v) Base line

(vi) Moulded depth

(12 marks)

**Question Five**

a) State the FIVE degrees of freedom of a ship in motion (10 marks)

b) Explain the significance of girders in ship construction (1 mark)

c) With the aid of sketches, describe each of the following structures of a ship:

(i) Keel

(ii) Forecastle

(iii) Double bottom

marks)

(10