



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

DEPARTMENT OF MECHANICAL AND AUTOMOTIVE ENGINEERING

DIPLOMA IN MARINE ENGINEERING

**EMR 2220: SHIP CONSTRUCTION & NAVAL ARCHITECTURE**

END OF SEMESTER EXAMINATIONS

**SERIES:** APRIL 2015

**TIME:** 2 HOURS

**INSTRUCTIONS:**

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

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

## QUESTION 1

A large is constructed such that it has 2 profiles. A forward triangular section and an Aft rectangular section, with the following dimensions.

Overall length                    6M  
Draught (Designed)            1M  
Length of the rectangular section : 3m  
Maximum beam length        : 2m

The following beam length were recorded from forward to Aft at stations (0,1, 2, 3, 4) AS 0m, 1.5m 3, 4.5, 6m respectively.

Apply Simpson's First Rule to determine the centre of floatation of the large.

**(20 marks)**

## QUESTION 2

A ship of 15,000 tonne displacement has a water plane area of  $1950\text{m}^2$ . It is loaded in river water of  $1.00\text{t/m}^3$  and proceeds to sea where density is  $1.022\text{t/m}^3$ . Calculate the change in mean draught.

**(20 marks)**

## QUESTION 3

- a) Explain the working principle of propellers. **(5 marks)**
- b) Discuss the operation and features of any of the two types of propellers. **(5 marks)**
- c) Sketch a propeller and show the following features:
  - i) Boss
  - ii) Rake
  - iii) Shew
  - iv) Face
  - v) Back**(10 marks)**

## QUESTION 4

Sketch an outline arrangement of an oil lubricated stern tube and tail shaft. **(20 marks)**

## QUESTION 5

Sketch and describe the arrangement to support sterntube in a twin screwship. **(20 marks)**