



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

DIPLOMA IN MARINE ENGINEERING (DME YI, SII)

EMR 2122: SHIP CONSTRUCTION & NAVAL ARCHITECTURE II

END OF SEMESTER EXAMINATION

SERIES: APRIL 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

All questions carry equal marks

Maximum marks for each part of a question are as shown
This paper consists of **TWO** printed pages

Question One

- a) With the aid of a profile of a General Cargo ship illustrate the following:
- (i) Bridge deck
 - (ii) Boat deck
 - (iii) Navigating bridge deck
 - (iv) Wheel house top
 - (v) Tween deck
- (5 marks)**
- b) State the difference between the peak tanks and double bottoms **(5 marks)**
- c) With the aid of a sketch, illustrate a double hull and a cofferdam **(5 marks)**
- d) State the purpose of a double hull construction in a crude oil carrier. **(5 marks)**

Question Two

- a) With the aid of sketch, show the layout of framing and stiffening in the panting region. **(10 marks)**
- b) Give TWO merits of usage of steel hatches **(4 marks)**
- c) Draw the Plimsol line indicating the principal features of a ship. **(6 marks)**

Question Three

- a) With the aid of sketches, show the SIX degrees motion of a ship. **(5 marks)**
- b) Explain what is logging and sagging of the hull structure when the vessel is a float. **(5 marks)**
- c) Explain what is free surface effect and how it can be countered. **(5 marks)**
- d) List down FIVE conditions that must be met to have a successful inclined experiment. **(5 marks)**

Question Four

An inclining experiment was carried out on a ship of 4000 tonne displacement, when masses of 6 tonnes were moved transversely through 13.5m. The deflection of a 7.5m pendulum were 81, 78, 85, 83, 79, 82, 84 and 80mm. Calculate the metacentric height **(20 marks)**

Question Five

- a) State the purposes of a watertight bulk head **(8 marks)**
- b) With the aid of a sketch, show the THREE minimum bulkheads required in a ship. **(12 marks)**