

**INDIAN MARITIME UNIVERSITY**  
(A Central University, Government of India)

December 2016 End Semester Examinations  
Diploma in Nautical Science - First Semester (2015 batch onwards)

**Ship Construction & Ship Stability - I (UD11T3103)**

Date : 16.12.2016

Time: 2 Hrs

Maximum Marks: 70

Pass Marks : 35

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Note: Choice of One Question in each section (10 Marks)

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**Section - A**

**(Ship Construction)**

**(35 marks)**

1. With the help of a sketch show the following tanks:
  - (a) Double bottom tanks (3 marks)
  - (b) Deep tanks (3 marks)
  - (c) Peak tanks (3 marks)
  - (d) Ballast tanks (3 marks)
  - (e) Cargo tanks (3 marks)
  
2. Sketch and label **any two** of the following parts of a ship: (5 x 2 = 10 marks)
  - a. Draw to scale the Load line mark and the load lines for a ship.
  - b. Profile/midship section view of a ship showing freeboard, moulded & extreme depth and beam.
  - c. Sketch and label (i) Air Pipe (ii) Sounding Pipe (iii) Ventilator
  - d. Sketch the profile view of a ship and name the principal dimensions (Forward perpendicular, Aft perpendicular, LBP, LOA, amidships, depth & sheer).
  
3. Sketch and label the following parts
  - (a) Beam (2 marks)
  - (b) Bulkhead (2 marks)
  - (c) Bilge (2 marks)
  - (d) Rudder (2 marks)
  - (e) Deck (2 marks)
  
4. Write short notes on the following: (10 marks)
  - (a) Different types of Hatch Covers
  - (b) Hatch Coaming

**Section – B**  
**(Ship Stability)**

**(35 marks)**

5. Write short notes on:
- (a) Light weight & Dead weight (3 marks)
  - (b) Block Coefficient (3 marks)
  - (c) Reserve Buoyancy (3 marks)
  - (d) Relative Density (3 marks)
  - e. Tonnes per centimetre (3 marks)
6. (a) A box barge 65 m long and 12 m wide floats at a draft of 5.5m in sea water. Calculate (i) the displacement of the barge (ii) its draft in fresh water. (4 marks)
- (b) A ship 135m long, 18m beam and 7.6m draft has a displacement of 14000 T. The area of the load water-plane is 1925 sq.m and the area of the immersed mid-ship section is 130 sq.m. Calculate (a)  $C_w$  (b)  $C_m$  (c)  $C_b$  (d)  $C_p$ . (6 marks)
7. (a) Explain the terms “Fresh water allowance” and “Dock water allowance” (5 marks)
- (b) The water plane area of a ship is 1730 sq.m. Calculate the TPC in salt water and the increase in draft if a mass of 270 T is added to the ship. (5 marks)
8. A ship is floating in dock water RD 1.006. The water line to port is 12cm below the lower edge of the ‘S’ mark and on the starboard side is 4 cm above the upper edge of the ‘W’ mark. If the summer displacement is 21620 Tonnes (corresponding to a draft in saltwater of 6.86m, TPC 18.6), how much cargo remains to be loaded to ensure that the ship will be at the winter mark in salt water. (10 marks)

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