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 **Maximum Marks: 70**
Time: 2 Hrs **Pass Marks : 35**

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

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) Cw (b) Cm (c) Cb (d) Cp. (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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