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10MR52

Fifth Semester B.E. Degree Examination, Dec.2017/Jan.2018
Naval Architecture – I

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. The half breadth of the load water plane of a ship 150 m long commencing from 0 ft are 0.3, 3.8, 6.0, 7.7, 8.3, 9.0, 8.4, 7.8, 6.9, 4.7 and 0 m respectively. Calculate: i) Area of water plane, ii) Distance of centroid from midship, iii) Second moment of area about a transverse axis through the centroid. **(12 Marks)**

b. Explain Simpson's rule for 3-ordinates. **(08 Marks)**

2 a. Explain all four coefficient of forms with the help of neat sketch. **(10 Marks)**

b. The length of the ship is 18 times the draught while the breadth is 2.1 times the draught at the load water plane, the water plane area coefficient is 0.83 and difference between the TPC in sea water and TPC in fresh water is 0.7 determine the length of the ship and TPC in fresh water. **(10 Marks)**

3 a. Explain wetted surface area and its relation with similar figure. **(12 Marks)**

b. A ship of 5000 tonne displacement, 95 m long floats at a draught of 5.5 m, calculate the wetted surface area of the ship (i) using Denny's formula, (ii) Using Taylor's formula with c = 2.6 **(08 Marks)**

4 a. Explain stable, unstable and neutral equilibrium with neat diagram. **(12 Marks)**

b. Explain in detail about inclining experiment. **(08 Marks)**

PART – B

5 a. Explain the effect of suspended mass. **(08 Marks)**

b. A ship of 10000 tonne displacement has a mass of 60 tonne lying on the deck. A derrick whose head is 7.5 m above C.G of tank top 10.5 m below the deck. Calculate the shift in the vessels centre of gravity when the mass is: i) Just clear of the deck, (ii) At the derrick head, (iii) In its final position. **(12 Marks)**

6 a. If the density of sea water is 1.025 t/m^3 and the density of fresh water is 1.000 t/m^3, prove that the statutory fresh water allowance is $\frac{\Delta}{40\,TPC}$. **(10 Marks)**

b. A box barge 60 m long and 10 m wide floats at an even keel draught of 4m. It has a compartment a midship 12 m long. Calculate the new draught if this compartment is laid open to sea when (i) μ is 100%, (ii) μ is 85%, (iii) μ is 60%. **(10 Marks)**

7 a. With reference to dry-docking define the responsibilities when (i) prior to docking, (ii) whilst the vessel is in dry dock, (iii) prior flooding and leaving the dock. **(12 Marks)**

b. Write a note on loss of stability due to grounding. **(08 Marks)**

8 a. Write a note on types of resistance and list the various factors on which frictional resistance of ship depends. **(10 Marks)**

b. A ship speed is increased by 20% above normal for eight hours; reduced by 10% below normal for 10 hours and for the remaining six hours of the day the speed is normal; calculate the percentage variation in fuel consumption in that day from normal. **(10 Marks)**

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