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Fifth Semester B.E. Degree Examination, June/July 2015

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. Explain Simpson's first rule. (10 Marks)
 b. Define displacement and Buoyancy. (04 Marks)
 c. A ship displaces 12240 m^3 of sea water at a particular draught:
 i) Calculate the displacement of the ship.
 ii) How many tonnes of cargo would have to be discharged for the vessel to float at the same draught in fresh water? (06 Marks)
- 2 a. Explain all the four coefficient of forms. (12 Marks)
 b. A ship 135 m long, 18 m beam and 7.6 m draught has a displacement of 14000 tonne. The area of the load water plane is 1925 m^2 and area of the immersed midship section 130 m^2 . Calculate: (i) C_w , (ii) C_m , (iii) C_b , (iv) C_p . (08 Marks)
- 3 a. Explain wetted surface area. (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 inclining experiment. (12 Marks)
 b. A mass of 6 tonne is moved transversely through a distance of 14 m on a ship of 4300 tonne displacement, when the deflection of an 11 m pendulum is found to be 120 mm. The transverse metacentre is 7.25 m above the keel. Determine the height of centre of gravity above the keel. (08 Marks)

PART – B

- 5 a. Explain effect of suspended mass. (10 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 the C.G. of the mass, is used to place the mass on the tank top 10.5 m below the deck. Calculate the shift in the Vessel's centre of gravity, when the mass is: (i) Just clear of the deck, (ii) At the derrick head, (iii) In its final position. (10 Marks)
- 6 Explain change in trim due to adding of masses. (20 Marks)
- 7 a. Explain Docking stability. (10 Marks)
 b. Write a note on grounding of the ship. (10 Marks)
- 8 a. Write a note on frictional resistance. (10 Marks)
 b. A ship whose wetted surface area is 5150 m^2 travels at 15 knots, calculate the frictional resistance and power required to overcome this resistance. (10 Marks)

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