Fifth Semester B.E. Degree Examination, Dec.2016/Jan.2017
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 displacement in detail.   (10 Marks)
   b. A ship displaces 14420m^3 of sea water at a particular draught
      i) Calculate the displacement of the ship
      ii) How many tones of cargo would have to be discharge for the vessel to float at the
          same draught in fresh water?   (10 Marks)

2 a. Define prismatic co-efficient. What is the relation between C_p, C_b and C_m?   (08 Marks)
   b. Explain TPC in detail.   (06 Marks)
   c. The water plane area of a ship is 1730m^2. Calculate the TPC and the increase in draught if a
      mass of 270 tonne added to the ship.   (06 Marks)

3 a. Explain wetted surface area for similar bodies.   (12 Marks)
   b. A ship 110m long displaces 9000tonne and has a wetted surface area of 2205m^2. Calculate
      the displacement and wetted surface area of a 6m model of the ship.   (08 Marks)

4 a. Explain stable, unstable and neutral equilibrium.   (12 Marks)
   b. A mass of 6 tonne is moved transversely through a distance of 14m on a ship of 4300 tonne
      displacement. When the deflection of an 11m pendulum is found to be 120mm. the transfers
      metacentre is 7.25m 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 7.5m above C.G of tank top 10.5m below the deck. Calculate the shift in the
      vessels centre of gravity when the mass is
      i) Just clear of the duck   ii) At the derrick head   iii) In its final position.   (10 Marks)

6 a. Explain change in draught due to change in density.   (16 Marks)
   b. A ship of 10000 tonne displacement has a water plane area of 1300m^2. The ship loads in
      water of 1.010t/m^3 and moves into water of 1.026t/m^3. Find change in mean draught.
                                                                                      (04 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 residuary resistance.   (10 Marks)
   b. The residuary resistance of a mode 7m long is 20N when lowed at $3\frac{1}{2}$ knots. Calculate the
      power required to overcome the residuary resistance of a similar ship 140m long at its
      corresponding speed.   (10 Marks)

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