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***B.Tech. Degree VI Semester Examination in
Marine Engineering June 2014***

MRE 607 NAVAL ARCHITECTURE II

Time : 3 Hours

Maximum Marks :100

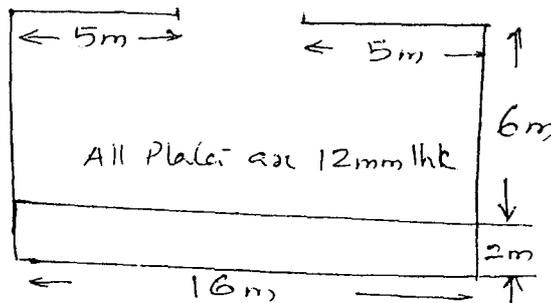
(All questions carry *EQUAL* marks)

(5 x 20 =100)

- I. (a) What are the static forces and dynamic forces acting on a ship? Briefly explain. (5)
 (b) A ship of rectangular shape 100m long is having 20,000t evenly distributed with load. (15)
 Another load of 10,000t is now placed amidships for a length of 40m, evenly.
 Find out:
 (i) Weight curve
 (ii) Buoyancy curve
 (iii) Load curve
 (iv) Shear force curve
 (v) Bending moment curve
 (vi) Specify whether the ship in 'hogging' or sagging condition.

OR

- II. (a) Briefly explain the effect of waves on the loading on ship and its bending moment. (5)
 (b) A ship of midship section as shown below has uniform thickness of 12mm. Calculate (15)
 the section modulus at deck and bottom. Find out the stress at deck and bottom when a bending moment of 600 MN_M is acting.



- III. (a) Draw sketches showing the views of a screw propeller and mark the parts root, tip, hub, shaft, leading edge, trailing edge, skew and rake. (5)
 (b) The pitch angle measured at 4 meters from centre of the propeller is 18.5 degrees. (15)
 Find (i) The pitch of the propeller (ii) If the dia of propeller is 8m calculate the P/D ratio and pitch angle at tip.

OR

- IV. A propeller is having a pitch of 5.5m speed of 3.5 rev/second. Delivered power is 2300kW and efficiency of propeller = 70%. If the ship speed is 14Kn and speed of advance is 11.5 knots calculate: (i) Real slip (ii) Wake factor (iii) Propeller thrust. (20)

- V. (a) Explain balanced, unbalanced and semi-balanced rudders with suitable sketches. (5)
 (b) A rudder has an area of 16m² with the centre of effort 0.95m from centre of stock. The maximum rudder angle is 35° and to be designed for a service speed 15 knots. Calculate diameter of rudder stock if the maximum allowable stress is 55MN/m² and the rudder force parallel to the centre line of the ship is given by $F = 580 AV^2$ Newtons where v in M/sec. (15)

OR

(P.T.O.)

A ship is moving in a circular path of radius 4.2 m. The ship is moving with a constant speed of 18 knots. The centrifugal force acting on the ship is 2.5 m above the center of gravity. Find the force of gravity acting on the ship.

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