Indian Maritime University

(A Central University, Govt of India)

May-June 2018 End Semester Examinations

B. Tech (Marine Engineering)

Semester-VI

Naval Architecture II (UG11T2605/1605)

Date:18.06.2018 Max Marks:100 Marks

Time: 3 Hrs Pass Marks: 50 Marks

PART – A Marks:10 X 3=30

(All questions are compulsory)

Write Short and to the point answers to the following questions.

1. (a) Explain the difference between a right handed screw propeller and a left handed screw propeller.

   (b) What is the purpose of having a rudder on a ship.

   (c) Explain the difference between a balanced rudder and an unbalanced rudder.

   (d) What is a Kort Nozzle.

   (e) What is a Voith Schneider Propeller.

   (f) What is a Controllable Pitch Propeller.

   (g) Explain how to calculate the stress on deck at midship, when the Bending Moment at midship is known.

   (h) What precautions are to be taken while loading bulk cargo into the holds of a Bulk Carrier to maintain the structural integrity of the hull.

   (i) What are the six degrees of freedom in the context of the Ship Motions in Waves.

   (j) Use of Bilge Keels.

PART – B Marks: 5 X 14=70

(Answer any 5 of the following)

2. A rudder has an area of 15 m^2 with its centre of effort 0.9 meter from the centre of the rudder stock. The maximum rudder angle is 35 degrees and it is designed for a service speed of 15 Knots. Calculate the diameter of the rudder stock if the maximum allowable stress in the stock is 55 MN per square meter and the rudder force parallel to the centre line of the ship is given by 580 A v^2 with v in meters per second.

[14]

3. (a) What are Weight Curve, Buoyancy Curve, Load Curve, Shear Force Curve and Bending Moment Curve in the context of Ship Strength Calculations.

[7]

(b) Describe the various properties of these four types of curves mentioned in Question 3(a).

[7]

4. A propeller 4.6 meter diameter has a pitch 4.3 meters and has a boss dia 0.75 meter. The real slip is 28% at 95 RPM. Calculate the Speed of advance, Thrust and Thrust Power.

[14]

5. A ship travels at 14 knots when the propeller, 5 meter pitch turns at 105 RPM. If the wake fraction is 0.35, calculate the apparent and real slip.

[7+7]

6. A Midship Section Drawing is shown here. (See Fig.1)
(a) Calculate the Moment Of Inertia of the Ship Section.
(b) Calculate the Section Modulus at Deck & Section Modulus at Keel.

[7+7]

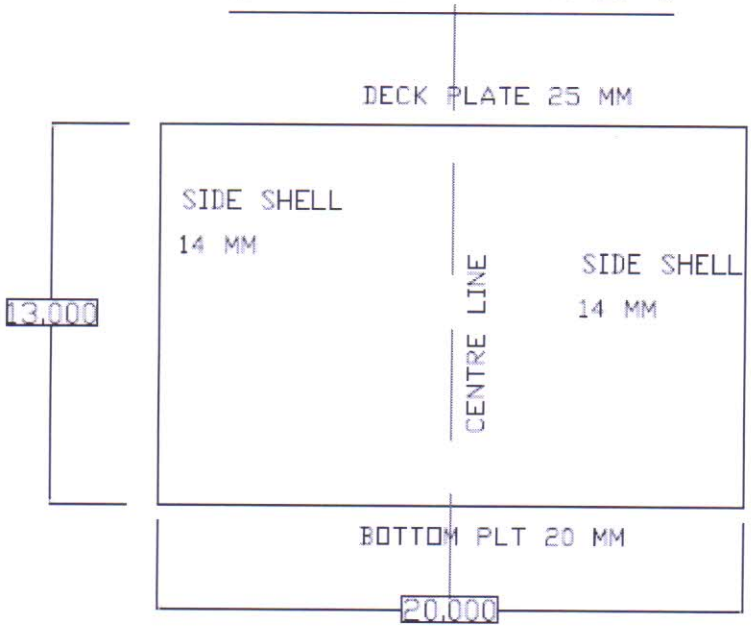
7. What are the various methods of Ship Roll Stabilization available. Elaborate on them, bringing out the advantages and disadvantages of each system of Ship Roll Stabilization.

[14]

8. Describe the process of formation of waves on the ocean. What are the factors that determine the formation of a "Fully developed Sea".

[14]

DRAWING FOR Q.NO. 6



MIDSHIP SECTION

BREADTH= 20 METER

DEPTH = 13 METER

(Fig.1)

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