

INDIAN MARITIME UNIVERSITY
(A Central University, Government of India)

May/June 2016 End Semester Examinations
B.Tech. (Marine Engineering) – 2009 batch onwards

Semester - VI
Naval Architecture - II (UG11 T1605 / T2605)

Date : 18.06.2016

Time: 3 Hrs

Max. Marks: 100

Pass Marks : 50

Part-A

(3 x 10 = 30 Marks)

Compulsory Question

1. a) Differentiate between Right handed propeller and Left handed propeller.
- b) How propeller cavitation takes place?
- c) What do you understand by laws of similarity for propellers?
- d) State the difference between balanced rudder and unbalanced rudder.
- e) Briefly explain the parameters affecting forces on a ship's rudder.
- f) What is the significance of calculating section modulus of midship section?
- g) Discuss about stress acting on deck plating of a ship.
- h) What do you understand by sagging and hogging of a ship?
- i) State location and purpose of bilge keel.
- j) Draw figure and marks six degrees of freedom of a ship.

Part - B

(5 x 14 = 70 Marks)

Answer any five of the followings

2. Sketch a typical right handed screw propeller and indicate the following:
(a) Leading Edge (b) Trailing edge (c) Hub (d) Root (e) Tip
(f) Rake (g) Skew (7x2)
3. (a) Explain apparent slip, real slip and wake fraction.
(b) A propeller of 4.5m pitch turns at 120 rev/min and drives the ship at 15.5 knots.
If the wake fraction is 0.30 calculate the apparent slip and the real slip. (6+8)
4. (a) Derive an expression for determining the angle of heel while turning.
(b) A ship with a metacentric height of 0.4m has a speed of 21 knots. The centre of gravity is 6.2 m above the keel while the centre of lateral resistance is 4m above the keel. The rudder is put hard over to port and the vessel turns in a circle 1100m radius. Calculate the angle to which the ship will heel. (6+8)
5. A rectangular shaped ship of 140 m long having weight 12,600 tonnes is evenly distributed over the length. Another load of 280 tonnes is distributed evenly amidships for a length of 40 m. Determine the following:
(a) Weight distribution curve (b) Buoyancy distribution curve
(c) Load curve (d) Shear force curve (e) Bending moment curve (14)

6. A rectangular bulkhead is 10 m wide and 8 m deep. It is loaded on one side only with oil of relative density of 0.8. Calculate the static pressure acting on the bulkhead if oil is
- (a) Just at the top of the bulkhead. (b) 3 m up the sounding pipe.
- Show the pressure distribution for both cases. (14)
7. (a) Explain the features of trochoidal waves. (7+7)
(b) Explain the features of wave spectrum.
8. Discuss various kinds of anti -rolling devices. (14)
