

**B.Tech. Degree VI Semester Supplementary Examination in
Marine Engineering April 2022**

MRE 1607 NAVAL ARCHITECTURE II

(2013 Scheme)

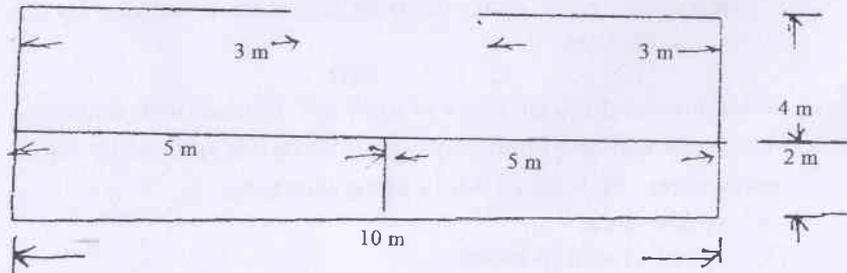
(2000 to 2013 Admissions)

Time: 3 Hours

Maximum Marks: 100

(5 × 20 = 100)

- I. (a) Mid-ship section of a Rectangular Barge is given below:
Calculate (i) Section modulus at deck, double bottom and bottom. (17)



All Plate Thickness 20 mms

- (b) If the maximum bending moment acting on the above section is 490 MNm, calculate the stresses acting on bottom shell, tank top and at deck. (3)
- OR**
- II. (a) The hull of a 80 m long rectangular Barge has a uniformly distributed mass of 640 t over the length. Machinery weight 200 t is uniformly distributed at a midships for a length of 20 m. End tanks at aft and forward of 20 m length each are loaded 340 t each. Construct the curves of Load, SF and BM. (14)
- (b) (i) Find location and values of maximum SF and BM. (6)
(ii) Value of SF and BM at 25 m from aft.
- III. (a) Define P.C and Q.P.C. Derive them in terms of efficiencies. (3)
(b) Following are the details obtained during acceptance trials of a ship. (17)
- | | | |
|------------------------------|---|------------|
| Ship speed | = | 15.4 Knots |
| Delivered power to propeller | = | 2500 kw |
| Effective power | = | 1730 kw |
| Propeller Thrust | = | 274 KN |
| Propeller speed | = | 1.75 rps |
| Propeller efficiency | = | 64% |
| Pitch ratio | = | 0.75 |
| Apparent slip | = | 5% |
- Calculate:
- (i) Thrust deduction factor
(ii) Taylor's wake fraction
(iii) Propeller diameter.
- OR**
- IV. (a) Draw the profile of a propeller and mark the following dimensions/parts: (4)
Diameter, Root diameter, Rake, Tip, Face, Back.
- (b) A propeller of 6 m diameter having pitch ratio = 0.9, B.A.R = 0.48, rpm = 110, real slip ratio = 0.25, wake fraction = 0.3 propeller thrust = 700 KN and propeller efficiency = 0.65. (16)
Calculate: (i) Blade area (ii) Average pressure on the blade surface
(iii) Ship speed (iv) Thrust power (v) Delivered power (vi) Torque on the shaft.

(P.T.O.)