Students Exam No: _____

GANPAT UNIVERSITY

B.Tech. Semester V (Marine Engineering)

Regular Examination : November ~ Dec -2014

02MR503 NAVAL ARCHITECTURE - I

Date: 28/11/2014

Time-3 HOURS

Total Marks : 70

INSTRUCTIONS: (1) Attempt all questions.
       (2) Assume suitable data where necessary
       (3) Figures to the right indicate full marks
       (4) Start New Question on New Page
       (5) Total Pages in the Question Paper: 3
       (6) Draw and Explain with diagrams where required

Section-I

Q-1:   Answer the Following   (12)

  a)   Explain in Brief 6

    i)   Free Surface Effect

    ii)   Archimedes Principal

  b)   A ballast tank is 15m Long, 12m wide and 1.4 m deep and is filled with fresh water. Calculate the load on the top and short side if :

    i.)   The tank is just completely full

    ii.)   There is head of 7m of water above the tank top.

<div align="center">OR</div>

Q-1:   Answer the Following   (12)

  a)   Explain load on an immersed plane...4

  b)   Centre of Gravity 4

  c)   Relative Density 4

Q-2 Attempt Following: (11)

a.) A double bottom tank is 1.2 m deep and has a sounding pipe extending 11m above the tank top. The tank is filled with oil (rd : 0.89) to the top of the sounding pipe. The double bottom floors are spaced 750mm apart and are connected to that tank top by riveted angles, the rivets having a pitch of 7 diameters. If the maximum allowable stress in the rivets is 30MN/m2, calculate the pressure in KN/m2 on the outer bottom and the diameter of the rivets.

b.) A bulkhead 9m deep is supported by vertical stiffeners 750mm apart. The Bulkead is flooded to the top edge with sea water non one side only. Calculate :

    i.)   Shearing force at the top

    ii.)   Shearing force at bottom

    iii.)   Position of zero shear.

Q – 3   Answer Following Questions (12)

a.) A ship displaces 12000 tonne, its centre of gravity is 6.50 m above the keel and its centre of buoyancy is 3.60 m above the keel. If the second moment of area of the waterplane above the centre line is 42.5 X 10³ m4 find the metacentric height.

b.) A vessel of constant triangular cross – section is 9m wide at the deck ajd has a depth to deck of 7.5 m. Draw the metacentric diagram using 0.5m intervals of draught up to the 3.0 m water line.

Section-II

Q-4: Explain Inclining Experiment (12)

Q-5 Attempt Following (11)

a) Explain Following Terms   ………………………………………….. 6

    i)   TPC

    ii)   Wetted Surface Area

b) Explain in one line: 5

    i) TPC

    ii) BM

    iii) KB

    iv) SCF

    v) KM

Q-6 Attempt following -

(12)

a) A ship of 5000 tonne displacement, 96m long, floats at draughts of 5.60m, forwatd and 6.30 m aft. The TPC is 11.5, GM(L)105m and centre of floatation 2.4 m aft of midships. Calculate :

   i) the MCTI cm

   ii) the new end draughts when 88 tonne are added 31m forward of midships.

b) A ship 180m long has ½ widths of water plane 1,7.5,12,13.5,14,14,14,13.5,12,7 and 0m respectively. Calculate :

   i)   Waterplane area

   ii)   TPC

   iii) Waterplane area and coefficient.

END OF PAPER

Page 3 of 3