



BT MRE - V - 09 - 17

B.Tech Degree V Semester Examination in Marine Engineering, June 2009

MRE 507 NAVAL ARCHITECTURE I

Time : 3 Hours

Maximum Marks : 100

- I. (a) Explain any five ship types. (10)
(b) Explain various structures/vessels for offshore activities. (10)
OR
II. Explain statutory ship surveys. (20)
III. Explain the drawings and data which represent the geometry of the ship. (20)
OR
IV. The half ordinates of load water plane of the ship 81 m long are as follows:

Station												
½ ord.	0	½	1	2	3	4	5	6	7	7 ½	8	
[m]	0	1	2	3	4	5	5	5	4	3	1	

Find : water plane area, LCF, TPC, I_T and I_L . (20)

- V. (a) What are the components of ship's resistance? Explain Reynolds Number and Froude Number and their effects on resistance. (10)
(b) A vessel is in the form of a triangular prism 32 m long, 8 m wide at the top, and 5 m deep floating with its vertex down. The centre of gravity is at a height of 3.7 m above base. Find the initial metacentric height when floating on even keel at 4 m draft. (10)
OR
VI. (a) Explain stability and its importance for ships. What are the conditions of stable equilibrium of a surface ship and a submarine? (10)
(b) What is effective power and how is it related to main engine power? Explain fuel coefficient admiralty coefficient. (10)
VII. (a) Explain floodable length and how it is affected by permeability. What is the use of floodable length calculation? (10)
(b) A box-shaped vessel is 50 m long and is floating on an even keel at 4 m draft. A compartment amidships is 10 m long and has 50% permeability. Find the increase in draft if this compartment is bilged. (10)
OR
VIII. (a) What is trim of a ship? How is it related to centre of floatation of water plane? Make a sketch and mark LCF and LCB of a rectangular barge floating on even keel. (10)
(b) Explain how you calculate the draft forward and aft if an end compartment of a rectangular barge is bilged. (10)

- IX. Write short notes on *any five* of the following :

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| (i) Dynamical stability | (ii) Inclining experiment |
| (iii) Tchebycheff's Rule | (iv) Froude's law of comparison |
| (v) Free surface effect | (vi) MARPOL |
| (vii) Deep sea diving | (viii) LNG carriers |
| (ix) Factor of subdivision | |

(5 x 4 = 20)