Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/BNS/SEM-1/BNS-106/2010-11

2010-11

NAVAL ARCHITECTURE - I

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : $10 \times 1 = 10$

i) Inclination of ship due to internal cause is known as

a) heel

b) list

c) trim.

ii) In bad weather S.W. entering and flooding the tween-deck of cargo hold resulting in ship's

a) KG increases

b) KG decreases

c) KG remains same.

iii) Apparent loss of weight is experienced by a floating body causing due to

a) relative density

b) buoyancy force

c) reserve buoyancy.

iv) Dead weight of a ship denotes

a) total weight of ship

b) light weight of ship

c) cargo carrying capacity of ship.

v) KB of a triangular shaped ship, when freely floating on water is

a) $\frac{1}{2}$ of its draft

b) $\frac{1}{3}$ of its draft

c) $\frac{3}{4}$ of its draft.

vi) The transverse curvature of the ship's deck from centre line down to the sides is known as

a) sheer

b) camber

c) tumble home.

vii) The application of welding to shipbuilding is almost entirely restricted to

a) resistance or pressure welding

b) fusion welding

c) both (a) and (b).

viii) The C.O.G. of a ship will move directly away from the C.O.G. of cargo when

a) loaded

b) discharged

c) shifted.

ix) For a vessel to be unstable her GM must be

a) zero

b) positive

c) negative.

x) Freeboard is the

a) total height of ship

b) draft

c) none of these.

xi) Type of collision bulk head is

a) watertight

b) non-watertight

c) corrugated.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Explain hogging and sagging, reserve buoyancy.

3. a) Define free surface effect.

   b) What are TPC and FWA ? Explain.

4. Briefly discuss the type of steel used in ship construction.

5. State the type of riveting. Discuss the advantages of welding over riveting in ship construction.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

6. With a simple sketch of a general arrangement of a cargo ship label the following :

   Cargo hold, Tween deck, Deep tank, Duct keel, Poop deck, Hatch, Bow, Aft peak tank, Fore peak tank and Steering compartment.

7. a) A cube of wood of relative density 0.81 has sides 30 cm long. If a mass of 2 kg is placed on top of the cube with its centre of gravity vertically over that of the cube, find the draft in salt water. 7

b) A vessel has displacement of 11,000 tons, KG 6.3 m. A jumbo derrick is used to shift a weight of 250 from the lower hold (KG 3 m) to upper hold (KG 8.5 m). The head of the derrick is 19.5 m above the keel. Find the KG of the ship when

i) the load is hanging 1.0 m above the deck by the derrick

ii) shifting is over. 8

8. Briefly explain water plane coefficient, block coefficient, midship coefficient and prismatic coefficient and establish the relation between them.

9. a) A vessel floats in DW of RD 1.016 with her winter load line 100 mm below water on the port side and 180 mm below water line on starboard side. If FWA is 200 mm, TPC is 24 and summer load draft is 9.6 m, find DWT available. 7

b) Explain stable, unstable and neutral equilibrium. 8