Name : ....

Roll No. : ....

Invigilator's Signature : ....

CS/BNS/SEM-4/BNS-406/2013

2013
NAVAL ARCHITECTURE-II

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. Answer the following :   10 × 1 = 10

    A. Choose the correct alternatives for the following :

        i)   Chain locker in a ship must be located at the forward part and as low as practicable, because

             a) to maintain less GM

             b) to reduce ship's COG

             c) to reduce ship's KB

             d) to maintain trim by head.

        ii) When a ship moves from sea water into river water without change in displacement,

             a) draft increases

             b) draft decreases

             c) draft remains same
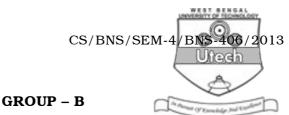
             d) Freeboard increases.

iii)   The purpose of bilge keel on a ship is

    a) to strengthen the keel of the ship

    b) to improve the frictional resistance of the hull

    c) to dampen the rolling of the ship

    d) to reduce the pitching of the ship.

iv)   A tender ship will have a

    a) small GM   b) large GM

    c) zero GM   d) none of these

v)   Timber deck cargo becoming saturated due to bad weather conditions, resulting

    a) rise in ship's C.O.G

    b) fall in ship's C.O.G

    c) ship's C.O.G remains in same position

    d) none of these.

B.   Answer the following in brief.

vi)   What is the difference between GZ and KN curves ?

vii)   Name the certificate which states that vessels are compliant in regard to MARPOL.

viii)   Name the shell plating which is adjacent to deck plating.

ix)   What is the use of stern tube fitted with tail end shaft of the engine ?

x)   Define the term 'centre of floatation'.

GROUP – B

(Short Answer Type Questions)

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

2. The half breadths of a ship's water plane, 180 metre long, at equal intervals from aft, are : 2·8, 4, 5·2, 6, 6·4, 6·8, 6·6, 6, 4·2 and 0 metres. Midway between the last two given figures, the halfbreadth is 2·4 m. Find the area of the water plane and the distance of the COF from the after end.

3. Write short notes on any *two* of the following :
   a) Bilge keel
   b) Hawse pipe
   c) Double bottoms.

4. A ship of 4000 tonne displacement has its centre of gravity 1·5 m aft of midships and 4 m above the keel. 200 tonnes of cargo are now loaded 45 m forward of midships and 12 m above the keel. Calculate the new longitudinal and vertical position of the centre of gravity.

5. a) Draw a sketch of transom stern and show how it is fitted with the stern frame. 2 + 3

   b) Explain the type of propellers and the advantages and disadvantages between them. 2 + 3

GROUP – C

(Long Answer Type Questions)

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

6. a) Sketch the midship section of a Bulk carrier ship and label the parts.

   b) A ship is floating upright on an even keel at 6·0 m draft *F* and *A*. The areas of the water planes are as follows :

Draft (m)	0	1	2	3	4	5	6
Area (sq.m)	5000	5600	6020	6025	6025	6025	6025

Find the ship's KB at this draft. 7 + 8

7. a) Discuss the role of classification society and various statutory certificates assigned by them.

b) A ship 130 m long displaces 14000 tonne when floating at drafts of 7·50 m forward and 8·10 m aft. GML 125 m, TPC 18, LCF 3 m aft of midships.

Calculate the final drafts when a mass of 180 tonne lying 40 m aft of midships is removed from the ship.

7 + 8

8. a) Enlist the type of cargo pumping pipeline arrangements in oil tanker and draw any of the arrangements.

b) A vessel has the following righting levers at a particular draft, based on an assumed KG of 7·2 m :

θ	0°	15°	30°	45°	60°	75°	90°
GZ	0	0·43 m	0·93 m	1·21 m	1·15 m	0·85 m	0·42 m

The vessel is loaded to this draft but the actual KG is found to be 7·8 m and the GM 1·0 m. Draw the amended statical stability curve.   7 + 8

9. a) Discuss briefly the various stresses acting on a ship, when the ship is at anchorage and also sailing at sea, encountering bad weather.

b) A box shaped vessel 60 m long, 10 m beam and 6 m deep is floating in salt water at drafts 4 m F and 4·4 mA. Find how far forward of amidships a weight of 30 tonnes must be loaded if the aft draft is to remain at 4·4 m.   7 + 8

10. a) What are the hazards involved while carrying grain in bulk ?

b) Describe various stresses as experienced by ships in still water and in seaway.

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