

Indian Maritime University
(A Central University, Govt of India)
End Semester Examinations – December 2023

Programme Name: DNS

Semester: II

Subject Code: UD11T5204

Subject Name: Ship Construction and Ship Stability – II

Date: 13.12.2023

Max Marks: 70

Duration: 03 Hours

Pass Marks: 35

General Instructions

- (i) All Questions in all Sections (A, B & C) are compulsory.
- (ii) Use of non-Programmable Scientific Calculator and M.V. Hindship Stability particulars booklet are permitted.

Section A

(Questions in this Section are of 1 mark each)

Q. Choose the correct option:

1 Mark each question

1. Centre of Flotation is the geometric centre ofof the ship.

- a. total volume
- b. underwater volume
- c. water plane area
- d. underwater area

2. The minimum bore of the sounding pipe must be _____ mm.

- a. 18 mm
- b. 32 mm
- c. 60 mm
- d. 65 mm

3. At 'Angle of Loll', the value of GZ (righting lever) is

- a. maximum
- b. positive
- c. zero
- d. negative

4. Frame numbers shown in all the plans are numbered from

- a. Forward to aft
- b. Aft to forward
- c. Mid-ships towards forward & aft
- d. Centreline to port & starboard

5. Capsizing Moment on a heeled ship, will be caused if

- a. KG is more than KB
 - b. KG is less than KM
 - c. KG is more than KM
 - d. KM is more than BM
6. Longitudinal framing in double bottoms is mandatory for vessels of more than
- a. 100m in length
 - b. 120m in length
 - c. 12m in breadth
 - d. 20m in breadth
7. KB for a triangular cross-section vessel (apex down) will be
- a. 1/3 the draft
 - b. 1/2 the depth
 - c. 2/3rd of depth
 - d. 2/3rd of draft
8. The "margin plate" is the _____.
- a. outboard strake of plating on each side of double bottom tank.
 - b. outer strake of plating on each side of the main deck of a vessel
 - c. a part of bottom construction that join the floor and frame construction of the ship
 - d. uppermost continuous strake of plating on the shell of a vessel
9. Free Surface moment depends mostly on the:
- a. Length of the tank.
 - b. Breadth of the tank.
 - c. Sounding of the tank.
 - d. Ullage of the tank.
10. LBP is the distance measured along _____
- a. Winter load line
 - b. Tropical Load line
 - c. Deck line
 - d. Summer Load line

Section B

(Questions in this Section are of 2 marks each)

Q. Write Short notes on the following:

(5 x 2 marks each = 10 marks)

- 11. Define floor and state its function on the ship.
- 12. Stiff vessel.
- 13. Pounding.
- 14. Trim.

15. List the two locations where can you find Fire Control Plan on board

Section C

(Questions in this Section are of 10 marks each)

Answer all questions:

16.

(2 x 5 Marks)

- a. A ship at port has displacement of 19617 tons and $KG=7.27m$. A weight of 500 tons is shifted from lower hold ($KG=5.0m$) to Upper Deck ($KG=13.28m$). Find the final GM fluid if KM and FSC in the final condition are 8.43m and 0.07m.
- b. Give at least 5 reasons for rise of COG, due to which a vessel may become unstable.

17. Sketch and Label a profile view of a typical Gas Carrier.

(10 marks)

18. M.V. 'Hindship' at a river port in water of RD 1.014 has a displacement of 10,230 t. GM (Fluid) 0.82m. FSC 0.077 m. She loads 470 t of cargo Kg 9.8 m. 150 t of water ballast is run into No. 1 DB tank. Find her final GM (Fluid).

(10 marks)

19.

(2 x 5 Marks)

Explain the following with reference to how are they caused, which part of the ship is affected by them and what control measures are in place to counter them?

- a) Panting
- b) Localised Loading

Q 20. A ship of 13750 tons' displacement, $GM = 0.75 m$, is listed 2.5° degrees to starboard and has yet to load 250 tons of cargo. There is space available in each side of No. 3 between deck (Centre of gravity, 6.1 m out from the Centre- line). Find how much cargo to load on each side if the ship is to be upright on completion of loading operation.

(10 marks)

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