

Indian Maritime University
(A Central University, Govt of India)

Mar/Apr 26 SE

Programme Name: B Sc (NS)

Semester: III

Subject Code: UG21T5302

Subject Name: Ship Stability Paper - 1

Date: 11.04.2026

Max Marks: 70

Duration: 03 Hrs

Pass Marks: 35

General Instructions

- (i) All Sections (A, B & C) are to be attempted.
- (ii) Options, if any, are specified in respective section.
- (iii) Scientific Calculator is permitted.
- (iv) Hindship Hyd. Particulars permitted

Section A

Ten Questions of 1 Mark each.

1. Relative density of a liquid is the number of times it is heavier than _____.
2. The volume of all enclosed spaces above the water line is called _____.
3. WNA loadline is applicable to ships whose length is _____.
4. Centre of Gravity is otherwise called as centre of _____.
5. LCB or AB is the distance between Centre of Buoyancy and _____.
6. When a vessel is in neutral equilibrium,
 - a. $KM > KG$
 - b. $KG > KM$
 - c. $KG = KM$
 - d. none of the above
7. The inclination of a vessel due to wind blowing on one side is called
 - a. List
 - b. Heel
 - c. Roll
 - d. Leeway
8. When a tank is transversely divided into n number of compartments, the FSC reduces by
 - a. $1/n$
 - b. $1/n^2$
 - c. $n-1$
 - d. none of the above
9. The factor used for finding the underwater volume of a ship shape is called
 - a. Waterplane co-efficient

- b. Midship co-efficient
 - c. Block co-efficient
 - d. Prismatic co-efficient
10. The formula used for calculating Righting lever for large angles of heel is called
- a. Wall sided formula
 - b. Ship sided formula
 - c. Top sided formula
 - d. none of the above

Section B
Five Questions of 02 Marks each.

- 11. State the principle of floatation. How is it useful in finding displacement of the ship?
- 12. Define TPC and derive a formula for calculating it.
- 13. Briefly explain Transverse Metacentric Height.
- 14. What is Free Surface Effect? State the formula for FSC.
- 15. Find the Displacement and TPC of M.V.Hindship at a hydrostatic draft of 5.6m in water RD: 1.015.

Section C
Answer all the questions. (10 Marks Each)

- 16. a. Briefly explain FWA and DWA
b. A vessel displaces 16000t at her summer load draft in SW. If she is now floating in DW of RD 1.015 with her summer loadline on the water, calculate how much DWT is available.
- 17. Differentiate between Stiff and tender vessels.
- 18. a. Sketch the midship transverse section of a box shaped vessel to show stable equilibrium when upright and heeled to a small angle.
b. If a ship displacing 12000t, heeled by 6° , has a righting lever of 0.1m, find the moment of statical stability. If the KM is 8.2m, find the KG.
- 19. A ship of 15000t W, KM 9.0m, KG 8.7m is listed 10° to port. She now loads 150t of cargo 7m above the keel and 4m to starboard of the centre line. Find the final list.
- 20. M.V.Hindship floating in condition No.5, discharges the entire cargo from No.1 TD, No.5 Poop Deck and refrigerated cargo spaces. No.4 DB tank(C) is filled with water ballast. FSC in final condition is 0.0895m. Calculate her GM(Fluid).