

INDIAN MARITIME UNIVERSITY

(A Central University, Govt. Of India)

B. Sc. (Nautical Science) – Semester VI

Naval Architecture, Paper VI

SUBJECT CODE: UG21T-2604

Time: 3 Hours

Max Marks: 70

Pass Marks: 35

N.B. : Use of non-programmable Scientific Calculator is permitted.

Section – A (Ship Construction)

Marks: 35

Note: Question No. 1 is Compulsory. Answer any **Two** of the remainder & all questions carry **10 marks**.

1. Write Short Notes on (2x5marks)
 - (a) Standard Fire Test as per SOLAS Chapter II - 2
 - (b) Permissible Length as per SOLAS Chapter II - 1
2. Discuss the role and functions of “Classification Societies” and name any five of them.
3. Explain the reasons for assigning Type A Ships (Liquid Cargo Carrier) with more draught as per International Load Line Convention of 1966 as amended.
4. Explain the Tonnage measurement terms such as “Gross Tonnage” & “Net Tonnage,” as per International Tonnage Convention 1969 as amended.

Section – B (Ship Stability)

Marks: 35

Note: Question No. 5 is Compulsory and Carries **10 marks**. Attempt any **Two** from the remainder and all questions carry **10 marks**.

5. M.V. Hindship was floating with all compartments empty except as follows:

No2 DB (P&S) Tanks full with water ballast.

No1 DB Tank contained 100 Tons of H.F.O.

An Inclining experiment conducted in this condition

A weight of 10 Tons, KG 10.2 m shifted transversely through a distance of 17.6 m, caused a deflection of 8.3 cms in a Plump line having 8.5 m of length.

Calculate the GM (S) and KG of the Light Ship.

6. (a) What are the conditions for a vessel to fall on “Angle of Loll”? Discuss the Stability of a vessel when she is at an “Angle of Loll”.

(b) Derive the formula:

$$\tan \theta = \sqrt{\frac{2GM}{BM}} \text{ for a box shaped vessel having large angle of heel.}$$

Where θ is the Angle of Loll.

- Q. 7 A Vessel of displacement 6,500 t, length 120 m, CoF 2 m for'd of midship, MCTC 110tm, TPC 15, KM 6.7m, K.G 6.1m at a draft of fore 4.0 m & Aft 6.20 m, is floating in a Dry dock, where the water level is 6.5 m. above the top of the blocks. Calculate the residual GM of the Vessel, when the water level is lowered by 1 m.
- Q. 8 A box shaped barge 40 m x 10 m floating at an even keel draft of 2 m in SW is divided into four equal compartments. At that draft cargo is level stowed as follows:-
No.1 & No.4 Hold – 135 t each
No.2 & No. 3 Hold – 165 t each
Draw the SF and BM curve for the barge.
- Q. 9. M.V. "HINDSHIP" is floating at a draft of F 8.778 m, A 8.892 m, LCG 72.34 m for'd of AP. She discharges 206 tones of cargo from No. 5 LTD. Calculate the drafts F and A.
