

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

End Semester Examinations – December 2025

Programme Name: DNS

Semester: I

Subject Code: UD11T6106

Subject Name: SHIP CONSTRUCTION AND SHIP STABILITY - I

Date: 12.12.2025

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 the respective section.
- (iii) Non programmable scientific calculator may be permitted

Section A

Ten MCQs/Fill in the Blanks of 01 Mark each – Choose the correct answer as applicable.

Q. No	Question	A	B	C	D
1	Extreme draught is measured as a vertical distance from the _____	lowest point of the keel to the Main Deck	base line to the summer load line	lowest point of the keel to the summer load line	base line to the tropical mark
2	The outward curvature of the side shell above the waterline near the forward end of the ship is known as _____	Camber	Flare	Rake of stem	Sheer
3	When a vessel with constant displacement moves from RD 1.000 to 1.025, its draft _____.	Increases	Decreases	Remains same	is difficult to predict
4	Segregated Ballast Tanks are provided in _____	Double hull Oil Tankers	Bulk Carriers	Container Ships	Ro Ro Ships
5	When a vessel discharges sea water from a DB tank, its KG _____.	increases	decreases	remains same	is difficult to predict

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6. A vertical line drawn at the point where the load waterline intersects the fore side of the stem is -----
7. ----- strake is located at the deck edge of the ship.
8. Floats are available in ----- (Sounding pipe, Air vent, Natural vent, Ullage pipe)
9. Block coefficient of a box-shaped vessel of 50m x 20m x 4m, when floating at 2m even keel draft is -----.
10. DWA is not applicable in the following case (1.005 to 1.025, 1.025 to 1.000, 1.025 to 1.020, 1.020 to 1.005)

Section B

Five Questions of 02 Marks each

11. Define the air draft of a ship. Show with a diagram.
12. Define Gross Tonnage and Net Tonnage
13. Define Reserve buoyancy and state its significance.
14. Illustrate the following standard steel sections:
(a) offset bulb plate (b) Unequal Angle
15. Define and illustrate the following:
(a) Sheer (b) Camber

Section C

Five Questions of 10 Marks each. All are compulsory.

16. Draw a bulk carrier ship and mark the following parts. Fore mast, cargo hold, hatch coaming, Engine room, Forepeak tank, Aft peak tank, Double bottom tank, collision bulkhead, poop deck, and rudder. **(10 Marks)**
17. What are the importance of Draft marks, Plimsoll Line, Load lines, Free board, and Air draft? **(10 Marks)**
18. a. Describe the content and importance of FFA Plan of a ship. **(5 Marks)**
b. Sketch a solid floor in longitudinally framed Double Bottom Tank and label the following parts: Margin plate, Intercostal side girder, centre girder, bottom and tank top longitudinal stiffeners and lightening holes **(5 Marks).**
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19. A bulk carrier vessel of 73153 T load displacement is loading in water of RD 1.010. Her summer load line is 25cm below water on the port side and 50cm above water on the starboard side. TPC is 64 T and FWA is 286 mm. Find the present displacement of the bulk carrier. **(10 Marks)**

20.

a. A ship of 5500 tonnes displacement has $KG = 5$ m, and she proceeds to load the following cargo:

1000 tonnes $KG = 6$ m

700 tonnes $KG = 4$ m

300 tonnes $KG = 5$ m

She then discharges 200 tonnes of ballast, $KG = 0.5$ m.

Find how much deck cargo ($KG = 10$ m) can be loaded so that the final KG of the ship is 6 m **(5 Marks)**.

b. A ship is floating in dock water RD 1.010 at a draught of 4.30 m. How much more cargo must be loaded to ensure that the ship will be at the Winter load line mark given that the Winter draught corresponding to the winter displacement is 4.32 m and the TPC is 21.5 and the FWA is 100 mm. **(5 Marks)**.

