
Indian Maritime University
(A Central University, Govt of India)
End Semester Examinations – December 2025
Programme Name: B Sc (NS)
Semester: V
Subject Code: UG21T5502
Subject Name: NAVAL ARCHITECTURE PAPER - I

Date: 08.12.2025

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 respective section.

Section A

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

10 X 1 = 10 Marks

1. A ship's bow lines are shown on a -----
 - a. GA Plan
 - b. Capacity Plan
 - c. Shear Plan
 - d. Midship section Plan
 2. Second moment of the immersed area about the water surface is expressed in
 - a. Tm^2
 - b. m^4
 - c. Tm^3
 - d. m^6
 3. The center of pressure of a plane vertical rectangular surface of height "h" is at ----- of the height of the immersed surface measured from liquid level.
 - a. $h/4$
 - b. $h/2$
 - c. $2h/3$
 - d. $3h/4$
 4. Stresses caused by loading is -----
 - a. SF & BM
 - b. Panting
 - c. Racking
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- d. slamming
5. The area of the ship that gets affected due to panting is _____
- TMI* a. Stern *TMI*
b. Bow
c. Midship
d. Hull
6. Loss of buoyancy/ volume lost due to bilging will not depend on _____.
- a. Length of compartment
b. Breadth of compartment
c. Permeability of compartment
d. Density of water the ship is floating in
7. The difference between the ship's loaded displacement and its light displacement is _____
- a. Gross Tonnage
b. Net Tonnage
c. Deadweight *TMI*
d. present Displacement *TMI*
8. Racking and Torsion are mainly due to-----
- a. Transverse Stress
b. Local Stress
c. Longitudinal Shear Force
d. Bending Stress
9. Steel plates on a ship are identified through _____
- a. GA Plan
b. Tank & Capacity Plan
c. Shell Expansion Plan
d. Docking Plan
10. Which ships are generally B60 or B100 with a low freeboard because of the large effective length of the superstructure *TMI*
- a. Ro-Ro Ships
b. Bulk carriers
c. Large Oil tankers
d. Large Chemical tankers

Section B

Answer all Five Questions

5 x 2marks = 10 Marks

11. Define Theorem of parallel axes
12. State what is understood by bilging of a compartment onboard a ship.
13. What is a General Arrangement Plan? *TMI*
14. Define Hogging and Sagging of a ship
15. How bilging of a Mid-ship compartment affect the ship?
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Section C

Five Questions of 10 Marks each. All are compulsory.

05 X 10 = 50 Marks

16. The water-plane areas of a ship are:

Draft	5	4	3	2	1	m
Area	2150	2100	2030	1925	1730	m ²

Between the keel and 1m draft, there is an appendage of 800 m³ volume whose geometric centre is 0.7 m above the keel. Find the displacement and the KB of the ship at 5 m draft in salt water. (10 Marks)

17. A tank's bulkhead is triangular, apex upwards, 14 m broad and 12 m high. Calculate KP (height of the COP above the bottom) when the sounding is 9 m. (10 Marks)

18. Draw midship sections of following vessels describing their strength and construction:

- a) - Ro Ro vessel 5 Marks
- b) - Fully refrigerated LPG carrier 5 Marks

19. Describe four stages of design as concept, preliminary, contract and detail design of ships. (10 Marks)

20. Explain any four types of launching of a ship and preparation for launching of ships (10 Marks)

