

**Indian Maritime University**  
**(A Central University, Govt of India)**  
**End Semester Examinations – June 2024**  
**Programme Name: B Sc (NS)**  
**Semester: VI**  
**Subject Code: UG21T5602**  
**Subject Name: Naval Architecture Paper-II**

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Date: 29.05.2024

Max Marks: 70

Duration: 03 Hrs

Pass Marks: 35

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General Instructions

- (i) All Sections (A, B & C) are to be attempted.
- (ii) All questions of sections A, B and C are to be attempted.

**Section A**

Choose the correct option and fill in the Blanks. (10 x 01 Mark each).

1. For dry-docking a ship, her trim should be maintained \_\_\_\_\_.
  - a. Less
  - b. More
  - c. Even Keel
  - d. Upright
2. The algebraic sum of the area enclosed by the, \_\_\_\_\_ to one side of the chosen point, is the shear force at that point.
  - a. Weight Curve
  - b. Load curve
  - c. Buoyancy Curve
  - d. Stress Curve
3. On increasing the freeboard of a vessel, her deck edge submerges \_\_\_\_\_.
  - a. Early
  - b. At 15 degrees
  - c. Never
  - d. Later
4. ----- is not a document requirement for a Loadicator.
  - a. Computer Manufacturers Certificate
  - b. Class Certificate for Loadicator
  - c. Class approved Loading Manual
  - d. Class approved Test Conditions

5. The purpose of the inclining experiment is \_\_\_\_\_.
- to find the KG of the loaded ship
  - to find the KM of the loaded ship
  - to find the KG of lightship
  - to find the KM of the lightship
6. The factor of subdivision is \_\_\_\_\_.
- equal or greater than one
  - equal or lesser than one
  - always less than one
  - always greater than one
7. Cavitation corrosion is an example of \_\_\_\_\_.
- Uniform Corrosion
  - Crevice Corrosion
  - Galvanic Corrosion
  - Erosion Corrosion
8. The conduct of Surveys for the compliance of IMO Conventions and Codes is the primary responsibility of -----.
- Classification Societies
  - Flag State Administration
  - Port State Control
  - IMO administration
9. As per MASS in the level of autonomy degree \_\_\_\_\_, the ship has automated processes and decision support.
- One
  - Two
  - Three
  - Four
10. In case there is a situation that requires a ship to sail for a few days with a notable deficiency. The Class will issue a \_\_\_\_\_ to the ship.
- Memoranda
  - Class Notation
  - Condition of Class
  - Class Warning

### **Section B**

Answer all 5 questions in short (about 20 to 30 words) (5 x 02 Marks each)

11. List the effect of increasing the Beam on the Ship's Stability.
12. List any 2 conditions when a certificate of class can be withdrawn.
13. Define the term sub-division of a passenger ship.
14. Explain "Permissible Length" affecting hull division on Passenger ships.
15. What changes take place with regards to stability after the ship's stern takes the first block while drydocking?

### **Section C**

Answer all Five Questions. All questions carry 10 Marks each.

16. A box-shaped vessel length 40 m and breadth 5 m, floating at an even keel draft of 1.0 m in fresh water. It has four Cargo holds of length 10 m each and breadth 5 m each. On arrival, the cargo is loaded as follows

Cargo Hold Number	Cargo loaded in tonnes
No.1 hold	200 t
No.2 hold	100 t
No.3 hold	100 t
No.4 hold	200 t

Calculate and draw the shear force and bending moment diagram for the loaded condition. (10 marks)

17. M.V. Indian Pride 140 m long enters a SW drydock drawing 4 m fwd and 6 m aft. KG = 8.3 m. Find the virtual GM when the water level has dropped by 1 m after the stern has taken to the blocks. (10 marks)

Hydrostatic Table of M.V. Indian Pride

Draft m	Displacement "t"	TPC t/cm	MCTC tm/cm	LCF m	KM m
4.6	9013	21.89	162.7	72.013	8.992
4.8	9451	21.97	164.3	71.970	8.828
5.0	9891	22.06	165.7	71.913	8.686
5.2	10333	22.14	167.1	71.842	8.566

18a. Describe the procedure for conducting an inclining experiment. (5 Marks)

18b. What is the information to be fed in the input module of a Loadicator? (5 marks)

19a. Briefly explain the unsymmetrical flooding of Passenger ship. (3Marks)

19b. Describe Cathodic protection by using a Sacrificial Anode System. (7 marks)

20a. Describe how will you go about planning for the enhanced surveys for the hull of a Bulk Carrier. (7 marks)

20b. An Oil tanker has been laid up for 6 years. Explain how her certificate of Class can be revived. (3 marks)

TMM