

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

**Sep/Oct'25 SE**

**Programme Name: B Tech (ME)**

**Semester: V**

**Subject Code: UG11T4506**

**Subject Name: SHIP STRUCTURE AND MARINE SHAFTING**

Date: 13.10.2025

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

Choose the correct answer as applicable.

**(10 x 1 = 10 Marks)**

1. The vertical structures in the cargo hold of a container ship through which the containers are aligned and loaded easily are called \_\_\_\_\_.
2. Towards the stern of the vessel two strakes often get narrower and finally join to a single plate called the \_\_\_\_\_.
3. Name the hull structural members extending athwart ship:
  - a) Girder
  - b) Stringer
  - c) Stiffener
  - d) Floor
4. Welded joints between two adjacent strakes are called:
  - a) end joints
  - b) seams
  - c) butts
  - d) through joints
5. Which of these ships are assigned minimum freeboard?
  - a) General cargo ships
  - b) Bulk carriers
  - c) Oil tankers
  - d) Container ships
6. Winter North Atlantic (WNA) load line markings are required in:
  - a) All ships sailing in that area
  - b) Ships less than 100m length
  - c) Ships greater than 100m length
  - d) Only special purpose ships
7. A \_\_\_\_\_ vessel having a \_\_\_\_\_ and \_\_\_\_\_ ; designed for the carriage of dry-cargo in bulk is known as bulk carrier.
  - a) Single deck, upper hopper, lower hopper
  - b) Single deck, upper stool, lower stool
  - c) Tween deck, crane, grab

- d) Multi-deck, hatch cover, cranes
8. A bilge keel is used to reduce/dampen a ship's tendency to:
- Roll
  - Pitch
  - Heave
  - All of these
9. What is bitter end?
- It prevents accidental slipping of the cable in case of failure of the brake arrangement.
  - It is the sprocket wheel in a windlass, used for heaving in the anchor.
  - The first link of each anchor chain connected with the Anchor.
  - The last link of each anchor chain connected with the bulkhead.
10. Give term used for the bottom shell plating in a double bottom ship:
- Bilge
  - Marginal bottom
  - Outer bottom
  - Bottom floor

### **Section B**

Answer the following in brief:

**(5 x 2 = 10 Marks)**

- What is Breast hook? Where and why it is used?
- What is Corrugated Bulkhead?
- In the context of ship's longitudinal strength, define 'hogging and sagging in seaway'.
- What is Hatch Coaming? How are they fitted and strengthened?
- Sketch section of Bulwark (through bulwark stay) & label it.

### **Section C (Answer any 5 out of 7)**

16. **(5+5 = 10 marks)**
- With the aid of neat sketches, explain in detail about racking & torsion in ship.
  - Mention three salient features of collision bulkhead in terms of location and structural integrity.
17. **(5+5 = 10 marks)**
- State the importance of providing load line marks in ships.
  - Sketch starboard side load line mark for a ship & label it.
18. Draw typical mid-ship section of a double hull oil tanker & mark all the structural elements. **(10 marks)**
19. **(5+5 = 10 marks)**
- Differentiate between longitudinal & transverse framing systems adopted for ship construction.
  - Sketch section through transversely framed double bottom of a ship at bracket floor.

20. **(5+5 = 10 marks)**

- a) What is the role of classification society in the design, construction & operation of vessels?
- b) List the names of any ten classification societies that perform ship-related surveys.
- 21.** Draw elevation through Anchor chain cable arrangement in ship and explain about its various components. **(10 marks)**
- 22.** Draw neat sketch of a ship's conventional propeller shafting and label its components. **(10 marks)**

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