

Indian Maritime University
(A Central University, Govt of India)
End Semester Examinations – June 2023
Programme Name: B Tech (ME)
Semester: V
Subject Code: UG11T3502
Subject Name: SHIP STRUCTURE AND CONSTRUCTION

Date: 14.06.2023

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.
- (iii) Tables (Steam/Log/Nautical Almanac etc) that can be used.
- (iv) Chart Work Booklets to be used.
- (v) Any other tables/charts to be used.

Section A

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

Q1. Which of these is NOT a type of weld in ship construction?

- A: Arc welding
- B: Iron welding
- C: Resistance welding
- D: Gas welding

Q2. Why do ships have bilge keels?

- A: Reduce ships tendency to roll
- B: Act as strength for anchor
- C: Storing cargo safely
- D: Opposing cross flow

Q3. What is the disadvantage of using steel in ship building?

- A: Cost
- B: Weight
- C: Buoyancy
- D: Rusting

Q4. Give term used for the bottom shell plating in a double bottom ship

- A: Bulwark
- B: Draft
- C: Outer bottom
- D: Bottom floor

Q5. Name the hull frame members extending athwart ship:

- A: Longitudinal frames
- B: Stringer frames
- C: Bow frames
- D: Transverse frames

Q6. What is the validity of a load line certificate?

- A: 5 years
- B: 25 years
- C: 10 years
- D: 15 years

Q7. A bilge keel is used to reduce/ damp a ship's tendency to

- a. Roll
- b. Pitch
- c. Heave
- d. All of these

Q8. Which stress in a ship's structure is caused by the longitudinal bending of the hull?

- A: Shear stress
- B: Racking stress
- C: Pounding stress
- D: Bending stress

Q9. What is bitter end?

- a. The first link of each chain is called the bitter end
- b. It prevents accidental slipping of the cable in case of failure of the brake arrangement
- c. The last link of each chain is called the bitter end
- d. It is the sprocket wheel in a windlass, used for heaving in the anchor

Q10. What is the purpose of watertight bulkheads in a ship?

- A: To provide additional space for cargo
- B: To prevent water from entering other compartments in case of a leak or damage
- C: To provide structural stability to the ship
- D: To serve as a sound barrier for noise-sensitive cargo

Section B

Five Questions of 02 Marks each

Q11. Define the concept of Dynamic Positioning Vessel?

Q12. What are some of the stress factors that affect a ship's structure?

Q13. What are the different types of welding techniques used in shipbuilding?

Q14. Explain different kinds of keels

Q15. What is the difference between longitudinal and transverse framing in a ship's structure?

Section C

Seven Questions of 10 Marks each of which any 05 questions to be answered.

Q16. Describe Racking, Pounding, and Panting in depth. How can the deformation of a ship structure be avoided as a result of their impacts in each case? (4+3+3) Marks

Q17. Explain the main types of ships and their general purpose. Cover both sea and offshore vessels. (10 Marks)

Q18. With the help of neat sketches, describe the ship's shell plating (10 Marks)

Q19. a. Describe a rudder carrier bearing with a sketch. (7 Marks)
b. Name various types of rudder pintles and their uses. (3 Marks)

Q20. Discuss the importance of welding in ship construction and the various techniques and defects that can occur during the welding process. (10 Marks)

Q21. a. Explain the concept of watertight integrity in ship construction. (6 Marks). b. Why it is important for ships to have watertight compartments and bulkheads, and how are these constructed to ensure water tightness? (4 Marks)

Q22. Explain:

A) Anchor and cable arrangements and its importance (3 marks)

B) Chain locker and its importance (3 marks)

C) How is anchor & chain system made safe for use? (4)