

**Indian Maritime University**  
**(A Central University, Govt of India)**  
**Supplementary Examinations – March/April 2025**  
**Programme Name: B Tech (ME)**  
**Semester: V**  
**Subject Code: UG11T4503**

**Subject Name: Marine Auxiliary Systems and Deck Machinery**

Date: 30.04.2025

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**

10 Questions of 01 Mark each – Choose the correct answer as applicable.

1. Vapour pressure of a liquid is
  - a. Pressure generated by the fluid at atmospheric pressure.
  - b. Pressure required to boil the fluid at the given temperature.
  - c. Pressure required to overcome the gravity.
  - d. None of the above.
2. The pump that is best suited for High volume and low head is
  - a. Screw pump
  - b. Peristaltic pump
  - c. Centrifugal pump
  - d. Gear pump
3. Sacrificial anodes are fitted on the
  - a. Shell of a shell and tube heat exchanger
  - b. End Cover of a shell and tube heat exchanger
  - c. Back plate of a Plate type heat exchanger
  - d. Front plate of a Plate type heat exchanger
4. Baffles are used in a Shell and tube type heat exchanger to
  - a. Increase the strength

- b. Guide the flow
- c. Absorb heat
- d. Corrosion prevention

5. Fresh water generator used on ship should not be run when the ship is passing through

- a. Coastal Waters
- b. Deep Sea Waters
- c. Cyclone
- d. None of the above

6. For starting a FWG, the correct sequence is as follows

- a. SW -Ejector circuit, feed water, heating water circuit, distillate extraction circuit
- b. Heating water circuit, SW -Ejector circuit, feed water, distillate extraction circuit
- c. SW -Ejector circuit, distillate circuit, heating water circuit, feed water circuit
- d. Feed water circuit, SW - Ejector circuit, distillate circuit, heating water circuit.

7. Total air receiver capacity is to be sufficient to provide without replenishment, not less than \_\_\_\_\_ consecutive starts of the reversible main engine.

- a. 6
- b. 10
- c. 12
- d. 8

8. Breather device on a Main Air compressor is used to protect the

- a. Suction and delivery valves
- b. Intercooler
- c. Aftercooler
- d. Crankcase

9. In a purifier, gravity disc with a larger hole will move the interface

- a. Towards the bowl periphery
- b. Away from bowl periphery
- c. Near the discharge pipe
- d. Towards the central shaft

10. In a ship Warping drum is related to

- a. Oil pollution equipment

- b. Windlass/Mooring winches
- c. Navigation equipment
- d. Automation

### **Section B**

Five Questions of 02 Marks each

- 11. Name at least 5 types of Positive displacement pumps.
- 12. What is the purpose of an air vessel in a reciprocating type positive Displacement pump?
- 13. What is meant by Biofouling in Heat Exchangers?
- 14. Explain the difference between purifying and clarifying?
- 15. List out parts of a typical hydraulic windlass (cable lifter).

### **Section C**

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

- 16. a. Sketch a Centrifugal pump showing the various components. (6 Marks).  
b. Compare and contrast the features of a Positive displacement pump Vs Rotodynamic pump. (4 Marks)
- 17. a) Sketch and describe the function and construction of shell and tube type heat exchanger and explain the terms single, two pass. State the materials used. (7 Marks).  
b) Mention the type of heat exchangers used for the following:  
i) Fuel oil heater, ii) Fresh water cooler, iii) Steam condenser iv) ME Jacket cooling water heater. (3 Marks).
- 18. a. Why does water produced in FWG plant on ship need treatment? (3 Marks)  
b. How is it made to fit for drinking? Discuss in detail. (7 Marks).
- 19. a. Sketch and explain a Two Stage Air compressor showing various safety devices fitted on the system. (7 Marks)  
b. What are the uses of Compressed air on a ship? (3 Marks)
- 20. a. Explain the regulations regarding the Air Reservoirs fitted to store Compressed air. (5 Marks)

b. State a few factors that can influence the purification of fuel oil on board. (5 Marks)

21. With respect to purifiers used in fuel oil systems

a. Describe the precautions and procedure for starting a purifier. (4 Marks)

b. Explain how modern purifiers WITHOUT a gravity disc work. (6 Marks)

22. a. Sketch a typical Electrically operated Windlass with Mooring rope drum. (6 Marks)

b. Draw a simple line diagram of a Life Boat Winch showing the various parts. (4 Marks)

