Indian Maritime University

(A Central University, Govt of India)

Mar/Apr'26 SE

Programme Name: B Tech (ME)

Semester: V

Subject Code: UG11T4503

Subject Name: Marine Auxiliary Systems and Deck Machinery

Date: 06.03.2026	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. The relationship between Head (h) and Discharge (Q) in a centrifugal pump is
   a. Directly proportional
   b. Inversely proportional
   c. equal
   d. no effect

2. The pump that is best suited for liquids of any viscosity is
   a. Rotodynamic pump
   b. Axial flow centrifugal pump
   c. Radial flow centrifugal pump
   d. Gear pump

3. Shell and tube heat exchangers are protected again Galvanic corrosion by
   a. ICCP System
   b. MGPS System
   c. Sacrificial Anodes
   d. Sacrificial Cathodes

4. Plate type heat exchanger is best suited for
   a. Low Pressure and Low temperature applications
   b. Low Pressure and High temperature applications
   c. High Pressure and Low temperature applications

d. High Pressure and High temperature applications

5. Fresh water generator used on ship should not be started until the Main engine is running at

a. Dead Slow Ahead
b. Slow Ahead
c. Half Ahead
d. Full Ahead

6. The Vacuum in a Low-pressure Fresh water generator should be as low as

a. 0.1 bar Abs
b. 0.1 bar Atm
c. 0.9 bar Abs
d. 0.9 bar Atm

7. Bursting Disc is fitted in a Main Air compressor on the
a. Cylinder Head
b. Valve Cage
c. Air Coolers
d. Crankcase

8. Unloader on a Main Air compressor is used to
a. Cool the Air temperature
b. unload water and oil from air
c. reduce the starting current of the motor
d. control the pressure of HP air

9. The removal of purified oil in fuel oil purifiers works on the principle of
a. Centripetal Force
b. Centrifugal force
c. Static Force
d. Gravity force

10. The Centrifugal brake is an item normally found in the
a. Mooring winch
b. Capstan
c. Life Boat winch
d. Chain locker.

Section B

Five Questions of 02 Marks each

11. What is meant by Cavitation in Pumps?
12. What is the purpose of installing Baffle plates in Shell and tube Heat Exchanger?

13. What is the purpose of the Oil-Water Separator in an Air Compressor?
14. State a few reasons for reduction in Vacuum in a Low-pressure Fresh water generator.
15. State and explain the parameters needed to use a Nomogram when choosing Gravity Disc for a Centrifugal Purifier.

Section C

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

16. a. Pressure pulsations in the delivery can damage the pump and pipelines. Explain with sketch the method adopted to eliminate this phenomenon in a double acting reciprocating pump.(6 Marks)

b. State the Advantages and Disadvantages of a Positive displacement pump over a Rotodynamic pump. (4 Marks)

17. a. Sketch a typical Shell and Tube Heat Exchanger showing the various parts. (7 Marks)

b. Shell and tube Heat exchanger needs to be protected again Electro chemical corrosion. Explain how this is achieved. (3 Marks)

18. a. Sketch a Plate type Freshwater generator of the Low-pressure evaporation type along with the pipeline explaining the operation. (7 Marks)

b. Explain the Post production treatment of Water produced by Fresh water generator to make it fit for human consumption. (3 Marks)

19. a. Sketch and explain a Two stage Air compressor stating the main parts. (7 Marks)

b. What is the purpose of a Fusible plug fitted on an Air Bottle? Explain the significance of this fitting. (3 Marks)

20. a. What are the regulations related to the Air Reservoirs fitted to store Compressed air? (4 Marks)

b. State the reasons for the following problems in Purifiers. (6 Marks)

(i) Bowl speed Low

(ii) Low Back pressure

21. a. Explain the starting procedure of a Heavy Oil Purifier on a ship. (7 Marks)

b. State a few safety devices fitted on the Purifier to ensure it is operated safely. (3 Marks)

22. a. Explain the automation, monitoring, and alarms of self-tensioning mooring winches (6 Marks)

b. Draw a block diagram of a Life boat Winch showing the various parts. (4 Marks)