

Indian Maritime University
(A Central University, Govt of India)
Supplementary Examinations – March/April 2025

Programme Name: B Tech (ME)
Semester: III
Subject Code: UG11T4306
Subject Name: Marine Machinery Systems

Date: 27.03.2025

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

(All questions are compulsory)
(10 x 1 = 10 Marks)

1. Suction strainers are fitted to most fluid systems. Which one of the following best describes the main purpose of a suction strainer?
 - (a) To protect the pumps from large solid particles.
 - (b) To improve the flow rate to the centrifuges.
 - (c) To protect the pumps from any water in the fuel.
 - (d) To remove all of the solids in the fluid

2. Taking samples of oil when bunkering is necessary for a number of reasons. Which one of the following is the recommended manner of obtaining a representative sample?
 - (a) Fill a sample container at ship's manifold by a continuous drip method.
 - (b) Directly from the supplier from shore-side/barge tanks.
 - (c) Fill a sample container at ship's manifold at the end of bunkering.
 - (d) Fill a sample container at ship's manifold at the start of bunkering.

3. Which of the following statements represents the path of air flow passing through a typical two stage, low pressure, reciprocating air compressor?
 - (a) Intercooler, L.P. cylinder, H.P. cylinder and Air Filter.
 - (b) L.P. cylinder, air filter, intercooler and H.P. cylinder.
 - (c) Air filter, L.P. cylinder, H.P. cylinder and intercooler.
 - (d) Air filter, L.P. cylinder, intercooler and H.P. cylinder.

4. Which of the following options best completes the following statement?
The main reason for heating fuel oil before it enters a purifier is to.
 - (a) Increase the density difference between fuel and water.

- (b) Decrease the density difference between fuel and water.
 - (c) Decrease the viscosity difference between fuel and water.
 - (d) Increase the viscosity difference between fuel and water.
5. Which ONE of these best describes the process of "Fresh Water Generator" on Ships?
- (a) Seawater is boiled at low pressure and temperature before being condensed into fresh water.
 - (b) Fresh water is boiled at low pressure and temperature before being condensed.
 - (c) Fresh water is boiled at low pressure but high temperature before being condensed.
 - (d) Fresh water is boiled at low pressure but high vacuum.
6. Accidental flooding of the engine room bilges by the bilge main is prevented by _____.
- a) Stop-check valves (non-return valves) installed in the bilge suction line.
 - b) Using a positive displacement reciprocating bilge pump.
 - c) Installing eductors in all bilge suction.
 - d) Installing a swing check before each bilge valve.
7. Which of the below colour code represents Fire-lines on ships.
- a) White.
 - b) Red.
 - c) Yellow.
 - d) None of the above.
8. Which of the below equipment is **NOT** fitted on bottom platform of ship:
- a) Incinerator.
 - b) Oily Water Separator.
 - c) Fire and General Service Pump.
 - d) Lube Oil Purifier.
9. Which of the below components is **NOT** a safety device on Compressed Air Bottle:
- a) Bursting Disc.
 - b) Safety Valve.
 - c) High pressure alarm.
 - d) Air Inlet Valve from Compressor.
10. A high differential pressure indication in an Oil Filter on board a ship indicates:
- a) Oil inlet pressure is low.
 - b) Oil outlet pressure is high.
 - c) Filter is choked / dirty.
 - d) All of the above.

Section B
(All questions are compulsory)
(5 x 2 = 10 Marks)

11. Name any 4 different types of merchant ships and respective cargoes they usually carry. (2 Marks)
12. State the purpose of Operating Water in a Centrifugal Separator. (2 Marks)
13. What are the uses of Steam on board a Ship? (2 Marks)
14. What do you mean by Priming of Filters. (2 Marks)
15. Explain why Mineraliser and Steriliser are used in domestic fresh water system on ships. (2 Marks)

Section C

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

- 16.a. What is the purpose of Compressed Air on board ships? (3 marks)
- b. List the safeties and trips fitted in a Two Stage Reciprocating Air Compressor use on Ships. (4 marks)
- c. Why air is being compressed in multiple stage in Air Compressors? (3 Marks)
17. a. What is the principle difference in purification process with respect to settling tank and centrifuges? (3 marks)
- b. What is desludging? How the desludging process is carried out? (3 marks)
- c. Sketch a Fresh Water Generator use on board ships showing all the arrangements for optimum operation. (4 Marks)
18. a. What do you understand by the core maintenance of filters? (3 marks)
- b. What are the different types of Filters used on Seagoing vessel? (4 Marks)

c. State the differences between Centrifugal Pumps and Positive Displacement Pumps. (3 Marks)

19. a. Explain with the help of a simple sketch the working principle of Centrifugal pump (6 Marks)

b. Describe Automation control of pumps & pumping systems on board the ship. (4 marks)

20. a. State the precautions to be taken in Bunkering Operation. (5 Marks)

b. What are the different types of Stabilizers used on ships? (5 Marks)

21. a. Draw a layout of Bottom Platform of a Ship's Engine Room and show different machineries / equipment (5 Marks)

b. State the function of each given below: (5 Marks)

- a. Fusible Plug on Compressed Air Bottle.
- b. Emergency Fire Pump.
- c. Emergency Bilge Suction.
- d. International Shore Connection.
- e. Incinerator.

22. a. Sketch and describe a Fresh Water Hydrophore System used on board ships (4 Marks)

b. What are the different types of Pipe Materials used on ships? (3 Marks)

c. Give a list of different colour codes used on ships with respect to different piping system. (3 Marks)