Indian Maritime University

(A Central University, Govt of India)

End Semester Examinations – December 2024

Programme Name: B Tech (ME)

Semester: III

Subject Code: UG11T4306

Subject Name: MARINE MACHINERY SYSTEMS

Date: 18.12.2024	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

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

1. Bunker samples are collected for:

a. For laboratory analysis.

b. For receiving ship and supply barge for future reference.

c. For MARPOL.

d. All of the above.

2. What colour coding is used for Sea water line?

a. Red.

b. Blue.

c. Green.

d. Silver.

3. 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.

4. Bunkering operation is directly related to "MARPOL" annexes:

a. Annex 1 and annex 5
b. Annex 2 and annex 6
c. Annex 3 and annex 4
d. Annex 1 and annex 6

5. Determine which of the following statements about Filters on board a ship is incorrect.

a. Filters are used to catch only very large particles.
b. Filters are used to prevent foreign particles and contamination of the fluid system.
c. Filters may be located in the reservoir, in the return line, in the pressure line or in any other location in the system.
d. Filters are classified as full flow and proportional or partial flow.

6. The purpose of the volute casing of the centrifugal pump is:

a. It spins the liquid inside the pump casing and provides centrifugal acceleration.
b. Is to collect the liquid discharged from the impeller at high velocity and gradually cause a reduction in liquid velocity by increasing the flow area.
c. It pushes the liquid in a direction parallel to the pump shaft.
d. To minimize the amount of liquid leaking through this clearance from the high pressure or discharge side of the pump back to the low pressure or suction side.

7. Reciprocating pumps are sometimes used for applications involving ------- and ---------.

a. Low pressures and high capacities
b. High pressures and high capacities
c. High pressure and low capacities
d. Low pressures and low capacities

8. Identify which component is not a safety device in a compressed air system.

a. Safety valve
b. Relief valve
c. Bursting disc
d. Auto – stop valve

9. Determine which of the following statements about effect of sea water salts during distillation process on board a ship is incorrect.

a. Deposition of scale is more pronounced when condensation temperature of corresponding shell temperature is low.
b. Deposition of scale is more pronounced when condensation temperature of corresponding shell temperature is high.
c. To prevent scale formation during the operation of fresh water generator, chemical is continuously dosed in the feed water.

d. When sea water is evaporated, salts contained by the evaporated water is left behind which increases the concentration of remaining water.

10. Thrusters [bow & stern] are used to control the movement of the vessel when the vessel speed is

a. High speeds only
b. Low speeds only
c. Independent of the vessel speed
d. None of the Above

Section B

Five Questions of 02 Marks each

11. List the name of tanks, pump and auxiliary machinery fitted of engine room top platform.
12. Explain the purpose of emergency bilge suction valve

13. What are the uses of Compressed Air on board a Ship?

14. Explain why Fuel Oil treatment is necessary before it is used for combustion.

15. State the benefits of ALCAP system over the conventional system.

Section C

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

16. a) Sketch a diagrammatic arrangement of a bilge pumping system, including the connection to other pumps.
b) Sketch a line diagram for sludge discharge to shore reception facility.
[6+4]

17. a) Describe the filter cleaning procedure.

b) Summarize the centralizing cooling water system.

[6+4]

18. a) Describe automation control for priming of pumps & pumping systems on board the ship.

b) State why oil purifier needs following data concerning oil: temperature, quantity of flow, density/specific gravity.

[6+4]

19(a). Sketch and describe the working of a two stage reciprocating air compressor. (7 Marks)

(b). List the mounting and safety devices fitted on air bottles. (3 Marks)

20(a). Explain with a sketch the working of a Fresh Water Generator used on-board ships. (7 Marks)

(b). Describe the treatment required on-board for water produced in Fresh Water Generator for Human Consumption. (3 Marks)

21(a). With the help of a simple sketch, describe the ALCAP System. (5 Marks)

(b). Explain how the de-sludging process is carried out. (5 Marks)

22. a) Explain the construction, mountings, and associated systems of air bottles in detail.

b) Explain hull protection and marine growth protection system.

[5+5]