

Indian Maritime University
(A Central University, Govt of India)
Supplementary Examinations – Mar/Apr 2024
Programme Name: B Tech (ME)
Semester: IV
Subject Code: UG11T4406
Subject Name: Marine Boilers and Steam Systems

Date: 21.03.2024

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. Service steam produced from the Auxiliary Boiler is delivered at a pressure of _____ bars.
 - a. 2
 - b. 7
 - c. 10
 - d. 15
2. Downcomers are the tubes in a Boiler that transfer the water from the
 - a. Steam drum to water drum
 - b. Steam drum to Overboard
 - c. Water drum to Steam drum
 - d. Water drum to Overboard
3. Scum Blow down Valve is used to remove _____ from the Steam drum.
 - a. Steam
 - b. Water
 - c. Oil and floating solids
 - d. Air
4. Steam Traps are fitted at the outlet of the
 - a. Hotwell
 - b. Deaerator
 - c. Economiser

d. Heat Exchanger

5. The acceptable 'P' alkalinity value of Boiler Feed Water is _____ ppm
- 100-150
 - 200-300
 - 300-400
 - 400-500
6. Hydrazine is a chemical that is used to remove _____ from Feed Water.
- Fuel Oil
 - Sea Water
 - Oxygen
 - Lube Oil
7. In the absence of Steam, the Steam Jet burner utilises _____ to atomise the Fuel.
- Pressurised Lube Oil
 - Compressed Air
 - Pressurised Water
 - None of the above
8. Blow back occurs in a Boiler due to accumulation of _____ in the furnace of the Boiler.
- Feed Water
 - Lube Oil
 - Steam
 - Hydrocarbon vapour
9. Soot blowers are normally fitted on a Boiler to blow steam on to the
- Generating tubes
 - Downcomers
 - Steam drum
 - Furnace tubes
10. Accumulation test is done on a Boiler to ensure that the correct size _____ are fitted on the Boiler.
- Gauge Glasses
 - Safety Valves
 - Burners
 - Steam stop valves

Section B

Five Questions of 02 Marks each

11. Briefly describe how steam is produced in marine boilers.

12. Briefly explain the function of Feed check valves fitted to a boiler.
13. Justify the need for an Observation tank above Hotwell.
14. Higher turn down ratio is desirable. Justify.
15. Will you weld a leaking Boiler tube on your ship? Explain.

Section C

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

16. Sketch and explain a Water tube Boiler with a Burner fitted on the top. (10 Marks)
17.
 - a. Scaling inside the Boiler tubes can be disastrous. Justify. (5 Marks)
 - b. Explain the concept of Acid cleaning of Boilers. (5 Marks)
18. Annex 6 of MARPOL requires your Boiler to be capable of burning both HFO and MGO. Explain the circuit with a proper line diagram. (10 Marks)
19. Testing of Boiler Feed water is critical to the well-being of the Boiler. Explain the need to test the following in a few lines.
 - a. Alkalinity (4 Marks)
 - b. Chlorides (3 Marks)
 - c. Sulphite test (3 Marks)
20.
 - a. Boiler being a pressure vessel needs to be protected by alarms and trips. Enumerate a few. (5 Marks)
 - b. State the function of flame eye and its importance in Boiler Automation. (5 Marks)
21.
 - a. List all the Mountings on the Auxiliary Boiler. (6 Marks)
 - b. Refractories are needed in a Boiler. Explain. (4 Marks)
22.
 - a. Sketch and explain the Steam Jet burner. (5 Marks)
 - b. When does the Boiler get tested hydraulically? Explain the testing procedure. (5 Marks)

