
Indian Maritime University
(A Central University, Govt of India)

Mar/Apr/26 SE

Programme Name: B Tech (ME)

Semester: IV

Subject Code: UG11T4406

Subject Name: Marine Boilers and Steam Systems

Date: 30.03.2026

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

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. Identify a boiler mounting
 - a. Steam drum
 - b. Vent valve
 - c. Water drum
 - d. Cascade tank
 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
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5. The acceptable 'P' alkalinity value of Boiler Feed Water is _____ ppm
- a. 100-150
 - b. 200-300
 - c. 300-400
 - d. 400-500
6. Hydrazine is a chemical that is used to remove _____ from Feed Water.
- a. Fuel Oil
 - b. Sea Water
 - c. Oxygen
 - d. Lube Oil
7. In the absence of Steam, the Steam Jet burner utilises _____ to atomise the Fuel.
- a. Pressurised Lube Oil
 - b. Compressed Air
 - c. Pressurised Water
 - d. None of the above
8. Possibility of boiler furnace explosion can be eliminated by
- a. fitting TDS sensor
 - b. ample pre and post purging operation
 - c. supply of inert gas
 - d. auto shut down
9. Process of removal of carbon, ash deposits from super heater/economizer coils is termed as
- a. Blowing through
 - b. Soot blowing
 - c. Bypassing
 - d. Blowing down
10. Test carried out after major repairs to the boiler pressure parts –
- a. Ultrasound test
 - b. Magnetic crack detection test
 - c. Hydraulic pressure test
 - d. Alkalinity test

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.
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13. State causes of boiler furnace blow back.
14. Explain purpose of feed water distribution unit in steam drum of a water tube boiler.
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) Explain working of a reducing valve with the help of a simple diagram (7 marks)
b) State a list of boiler mountings. (3 marks)
21. a) Explain procedure for flashing up of boiler from cold. (5 marks)
b) Explain procedure of laying up of a boiler for extended period of shut down. (5 marks)
22. a. Sketch and explain the Steam Jet burner. (5 Marks)
b. When does the Boiler gets tested hydraulically? Explain the testing procedure. (5 Marks)

