

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

End Semester Examinations – December 2022

Programme Name: B Tech (ME)

Semester: IV Semester

Subject Code: UG11T3401

Subject Name: MARINE BOILERS

Date: 25.11.2022

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. The basic purpose of steam drum in boiler is to

- a) serve as storage of steam
- b) serve as storage of feed water for water wall
- c) remove salts from water
- d) separate steam from water

2. The feed check valve is used in order to

- a) regulate flow of boiler water
- b) check level of water in boiler drum
- c) recirculate unwanted feed water
- d) allow high pressure feed water to flow to drum and not allow reverse flow to take place

3. The Primary flame of the Burner is used to heat up the

- a) lighter constituents of Heavy Fuel oil
- b) heavier constituents of Heavy Fuel oil
- c) water if any present in the fuel oil
- d) sulphur in the fuel oil

4. The function of attemperator is
- To keep the final steam temperature within certain desired limits
 - To produce steam at a constant temperature
 - To reduce the temperature of steam to saturation temperature
 - To provide necessary circulation of steam for auxiliary purposes
5. How does Foster wheeler ESD IV differs from Foster Wheeler ESD III?
- Extensive use of Mono walls
 - Tubes in these boilers are welded to stubs or directly to headers
 - The water drum has been dispensed with
 - All of the above
6. If oil contamination is suspected in the steam drum of the Boiler
- Boiler to be shut down and all the water drained immediately
 - Fill the boiler fully with water and push the oil out through the steam line
 - Boiler to be shut down and oil should be removed through the Scum valve only.
 - wait till the oil evaporates by itself and then restart the boiler
7. Steam temperature control for the ESD-II boiler is achieved by:
- Fitting a de-superheater between 1st & 2nd passes of superheater
 - Fitting an attemperator between 1st & 2nd passes of superheater
 - Gas dampers in boiler uptake
 - Bypassing the superheater
8. What is important to do before the burner is ignited
- Flush the firebox thoroughly with heavy oil
 - Flush the firebox thoroughly with air
 - rinse the igniter electrodes with feed water
 - Lower the temperature in order to get a better mix of water
9. The primary purpose of the refractory in a marine boiler is to
- conduct the heat of combustion away from the water wall tubes
 - protect the furnace casing and retain furnace heat
 - support the outer casing
 - protect the superheater from convectional heat transfer
10. Hydraulic pressure test of the Boiler is done
- During delivery and after every major repair
 - Once in 5 years
 - Annually
 - 10 years after delivery and every 5 years thereafter

Section B

Five Questions of 02 Marks each

11. What is the necessity of fitting ogee ring in a boiler?
12. What is the purpose of providing screen tubes in the boilers?
13. Why is gauge glass fitted on the boiler and how will you check its working condition?
14. What do you understand by the term "slagging"?
15. Name few Destructive and Non-Destructive tests that boiler materials are subjected to

Section C

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

16.
 - a) Sketch and describe a vertical tank boiler using thimble tubes. Give the plate thickness 7M
 - b) Name few General considerations governing the design of boilers 3M
17.
 - a) Sketch and describe the construction and operation of Babcock MR Boiler. 7M
 - b) Explain the methods of tube attachment used in Water tube boilers 3M
18.
 - a) Explain about forced circulation boiler with neat sketch 7M
 - b) Discuss the use of Use of Waste Heat Boilers in Motor Ships 3M
19.
 - a) Explain with sketches working principal of a remote water level indicator 6M
 - b) What is the purpose of scum valve and salinometer valves used in boilers 4M
20.
 - a) Explain in detail about Procedures of Closing up, and Raising Steam from Cold on a Water Tube Boiler 6M
 - b) What is the Emergency (Manual) Operation of Boiler Burner 4M
21.
 - a) Discuss briefly about failures of furnace materials used in boilers 5M
 - b) Describe with sketch Fuel oil viscosity control 5M
22. Write short notes on:
 - a) Water cooled air attemperator with neat sketch 5M
 - b) Procedure for Soot Blowing of a Water Tube Boiler 5M

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