

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

Sep/Oct'25 SE

Programme Name: B Tech (Marine Engineering)

Semester: Fifth

Subject Code: UG11T4504

Subject Name: Marine Steam Plant

Date: 10.10.2025

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

(Answer ALL the questions) (10 X 1 Mark = 10 Marks)

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

1. Efficiency of a thermal cycle increases by
 - a) Regeneration
 - b) reheating of steam
 - c) both (a) and (b)
 - d) cooling of steam
2. 100% efficiency of a thermal cycle cannot be achieved because of
 - a) frictional losses
 - b) it is not possible to achieve 0°K temperature
 - c) leakages
 - d) non-availability of ideal substance
3. Which of the following statement is correct?
 - a) The efficiency of steam turbines is greater than steam engines
 - b) A flywheel is a must for steam turbine
 - c) The turbine blades do not change the direction of steam issuing from the nozzle
 - d) The pressure of steam, in reaction turbines, is increased in fixed blades as well as in moving blades
4. The purpose of steam trap is to remove _____.
 - a) steam
 - b) solids
 - c) condensate and air
 - d) dissolved solids

5. Waste heat recovery boiler helps to _____ overall efficiency of the engine plant.

- a) no effect
- b) decrease
- c) first increases and then decreases
- d) increases

6. The reason for maintaining vacuum in marine steam turbine condenser is to _____ efficiency of the Rankine cycle.

7. The recommended value range of pH to be maintained for the boiler water to prevent corrosion is _____.

8. The purpose of tracing steam lines along the fuel oil service pipelines are to compensate for the _____.

9. Turndown ratio of marine boiler is the ratio between _____ and _____.

10. The purpose of soot blower is to _____.

Section B

(Answer ALL the questions) (10 X 2 Marks = 20 Marks)

- 11. Mention the various uses of steam on board ships.
- 12. What are the causes of water hammer?
- 13. What is meant by stalling in heat exchangers?
- 14. State the principle of working of a thermostatic steam trap.
- 15. What is the need for marine boiler survey?

Section C

(Answer ANY 5 questions) (5 X 10 Marks = 50 Marks)

16. With a neat sketch explain typical pipeline diagram of marine steam plant system integrated with turbo generator and waste heat recovery boiler. (10)

17.(i) Explain the advantages and disadvantages of thermal oil boiler system.(7)

(ii) What are the safety devices fitted on marine boilers? (3)

18. (i). Explain in detail recommended range of values of various constituents of boiler feed water for safe and efficient operation of marine boilers. (7)

(ii). What is meant by boiler blowdown and types of boiler blowdown? (3)

19. Explain with a neat sketch of arrangement of components, working of marine steam propulsion plant. (10)

20. (i). Sketch and describe a soot blower with control mechanism used in a water tube boiler. (7)

(ii). State the necessity of soot blower in boiler. (3)

21. Explain in detail various methods of improving efficiency of a marine steam propulsion plant. (10)

22. Explain in detail the procedure for shutting down the boiler for inspection and survey. (10)