

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

End Semester Examinations – December 2025

Programme Name: B Tech (ME)

Semester: V

Subject Code: UG11T4502

Subject Name: Marine Internal Combustion Engines and Technology 2

Date: 08.12.2025

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

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

1. The coincidence of the frequency of the natural vibration and the frequency of the forced vibration is termed as
(a) Balancing (b) Resonance (c) Couple (d) Moment

2. Transverse Vibration due to crosshead guide forces in a 2-stroke long/superlong stroke IC engine is taken care of by fitting: (a) Thrust block, (b) Stuffing box, (c) Side chocks, (d) Guide force damper.

3. Injection viscosity of RMG380 grade Heavy fuel oil is: (a) 380 cst, (b) 10 cst, (c) 100 cst, (d) 50 cst.

4. Jacket cooling water pre-heating of an IC engine is done to: (a) Prevent corrosion, (b) lower fuel consumption, (c) Improve governor response, (d) remove sediments.

5. Which of the following is/are medium speed Marine Engine(s)
a) Sulzer RTA b) MAN B&W SMC c) SEMT Pielstick d) All the above

6. Which of the following instrument is used to calculate the area of indicator diagram
a) Planimeter b) Indicator instrument c) Micro meter d) trammel gauge

7. Which of the following type of governor is used in Auxiliary engines
a) Isochronous Governor b) Variable speed Governor c) Both the above d)
None of these

8. TBN of Lubricating oil refers to its: (a) Total alkaline reserve, (b) Total acid content, (c) Viscosity of the oil, (d) Self-ignition temperature.

9. . What purpose do "Labyrinth" serve in turbochargers
(a) Sealing b) Reduce vibration c) corrosion inhibition d) converting pressure energy

10. Presence of Vanadium in marine fuel causes corrosion when the Vanadium to Sodium ratio is: (a) 4:1, (b) 6:1, (c) 3:1, (d) 2:1.

Section B

Five Questions of 02 Marks each

11. Identify two consequences of overloading of marine propulsion engine ?

12. What is the utility of the expansion tank in the main engine jacket cooling water system. Mention at least four functions.

13. Sketch a typical valve timing diagram for medium speed diesel engine

14. State the formula used to calculate Mean Effective Pressure (P_m), and the formula used to calculate the Indicated power (IP) from an indicator card diagram.

15. What are the main types of lubrication principles

Section C

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

16.(a) After a port stay of 48 hours, how is the main propulsion engine and its associated systems prepared for manoeuvring? Mention all the actions in sequence. (7 marks)

16(b). Mention 3 alarms and 3 interlocks for a modern 2-stroke marine diesel engine. (3 marks)

17. Describe various faults that can be diagnosed using draw card in marine diesel engines? (10 marks)

18(a). Sketch Bosch type fuel pump and explain how it functions in supplying fuel to the engine (5 marks)

18(b). For a MAN B&W marine main propulsion engine, describe the purpose and function of the VIT rack. Also elaborate how the VIT rack ensures maximum combustion efficiency. (5 marks)

19. Discuss the concept of Intelligent engines (camless engines) and how fuel injection is achieved in these engines. (10 marks)

20(a). Describe the functioning of an electronic governor (5 marks)

20(b). State the properties of Lube oil for marine Trunk piston engines and that of crosshead type engines. (5 marks).

21. Sketch and describe arrangement of a propeller drive from two medium speed diesel engines (10 marks)

22(a). Write down the crucial differences between a 2-stroke engine and a 4-stroke engine in terms of construction, power, application, emission, maintenance and other important aspects. (4 marks)

22(b). Write down the steps involved during decarbonisation of a 4-stroke auxiliary diesel generator onboard ship. (6 marks)

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