

Indian Maritime University

(A Central University, Govt of India)

End Semester Examinations – June 2025

Programme Name: B Tech (ME)

Semester: VI

Subject Code: UG11T4604

**Subject Name: MARINE PROPULSION PLANT AND AUXILIARY
MACHINERY: PERFORMANCE ASSESSMENT**

Date: 06.06.2025 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

Choose the correct answer as applicable 10x1=10

1. In the formula PLAN used for calculating Indicated Power, what does 'P' represent?
 - A) Peak Cylinder Pressure
 - B) Mean Indicated Pressure
 - C) Compression Pressure
 - D) Piston Displacement
2. What does SFOC stand for in terms of fuel consumption and efficiency of an engine?
 - A) Specific Fuel Oil Consumption
 - B) Standard Fuel Output Calculation
 - C) Specific Fuel Output Coefficient
 - D) Systematic Fuel Oil Control
3. What does paralleling of generators on board a ship refer to?
 - A) Running generators at different frequencies to balance the load
 - B) Synchronizing and connecting multiple generators to a common busbar for efficient load sharing

- C) Operating each generator independently without synchronization
- D) Using a single generator to supply power to the entire ship

4.) Preferential Trip operates in case of

- A) Under Voltage
- B) High Frequency
- C) Overload
- D) All of above

5) Following is Not an Alarm in Auxiliary Boiler

- A) Low Water level
- B) High Water level
- C) High water temperature
- D) All are Alarms

6) Reason for Purifier Bowl not closing is

- A) Operating water pressure is less
- B) Less RPM of Purifier
- C) Both option a and b
- D) None of the above

7. What is the primary reason for using multi-staging in marine air compressors?

- A) To increase the final discharge temperature of compressed air
- B) To eliminate the need for lubrication
- C) To avoid the use of intercoolers
- D) To bring compression closer to isothermal and reduce the work done

8. How do torque shaft meters calculate power in a marine propulsion system?

- A) By measuring the fuel consumption of the engine
- B) By detecting vibrations in the shaft
- C) By analysing temperature variations in the shaft
- D) By measuring the minute twist in the shaft

9. What is the primary purpose of a sea trial for a ship?

- A) To train the crew before the maiden voyage
- B) To test various systems under real operating conditions and ensure compliance with design and regulations

- C) To load cargo and test port operations
 - D) To conduct a ceremonial launch of the vessel
10. What causes carbon deposits in the cylinder head of a reciprocating compressor?
- a) Excessive moisture in intake air
 - b) Low suction temperature
 - c) Carryover of lubricating oil and overheating
 - d) Improper cooling system

Section B

All Five Questions to be answered of 02 Marks each 5X2=10

- 11. What is bumping clearance and the effect of it on the performance of an air compressor.
- 12. Explain Light Spring Diagram and what observation can be made using it.
- 13. List the critical equipment supplied power by Emergency Switch Board
- 14. Discuss the consequences of starting a boiler without pre-purging of the furnace
- 15. Mention 2 advantages of plate type heat exchanger.

Section C

Any05 questions to be answered out of 7 question. 10X5=50

- 16. Explain with sketches how the below are taken and what is their purpose.
 - 1) Indicator card (power card) 5+5
 - 2) Draw Card (out of phase diagram)
- 17. a) Explain with sketch the oil burning process in a marine boiler.
 b) Explain various factors for monitoring performance of Auxiliary Boiler on board 5+5
- 18. a) Explain with a sketch how a brushless alternator works and produces electricity.
 b) Explain five alarms that can occur on the Main Switchboard (MSBD) 5+5
- 19. a) Explain the procedure to recover from a blackout on a vessel.

b) Explain the parameters observed for performance assessment of Heat Exchanger 6+4

20. a)) What are possible causes of following malfunctions of Multistage Air Compressor

- i) First Stage Discharge pressure is low
- ii) Relief valve of First Stage is lifting
- iii) Oil Carryover to Air Bottle
- b)) Describe the parameters used to monitor the performance assessment of Main Air compressor used on board ship 7+3

21. With the help of block diagram describe electronic governor for Main engine on ship 10

22. a) Describe Manual Starting procedure of Fuel Oil Purifier, 7+3
 b) Describe "Back Pressure" of purifier.