

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

Any 05 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)
 - 2) Draw Card (out of phase diagram) 5+5
- 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.

b) Describe "Back Pressure" of purifier. 7+3