Indian Marit6ime University

(A Central University, Govt of India)

Sep/Oct'25 SE

Programme Name: B Tech (Marine Engineering)

Semester: IV

Subject Code: UG11T4403

Subject Name: Marine Internal Combustion Engines and Technology 1

Date: 27.09.2025 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. In the Otto cycle, the fuel/air mixture is ignited at what point and by what means?
A. At TDC by heat generated by compression.
B. Just before TDC by heat generated by compression.
C. Just before TDC by spark ignition.
D. At TDC by spark ignition

2. In Naturally aspirated engine, the volume of air intake is directly related to engine _____
A. Compression ratio
B. Valve size
C. Fuel pressure
D. Cylinder clearance volume

3. The linear motion of a diesel engine piston is converted to the rotary motion required to drive gears, propeller shafts, and generators by the _____.
A. flywheel
B. crankshaft
C. journal bearings
D. camshaft

4. Which of the following is one of the major advantages of resin choking over cast iron choking, in holding down arrangements of modern diesel engines?

A. Better vibration damping properties.
B. Better compressive strength
C. 100% contact, no need for surface preparation
D. None of the above

5. An engine indicator is used to determine_____
A. B.H.P
B. Temperature
C. Volume of cylinder
D. Mean effective pressure

6. Irregular circumferential wear of cylinder liner due to diminishing neutralising capacity of cylinder oil away from lubricating holes is known as
A. micro seizure
B. Scuffing
C. Scoring
D. Clover leafing

7.Idler sprocket is used in chain drives of marine engine
A. For changing the direction of motion
B. For Applying Tension
C. For increasing velocity ratio
D. All of the above

8. What is meant by elastohydrodynamic lubrication?

A. Addition of extreme pressure additive (EP) to the lubricant
B. Formation of hydrodynamic film under high pressure with minor elastic deformation of mating surfaces, distributing load over a greater area
C. Addition of Viscosity index improvement additive
D. Addition of elastomer based additives

9. A thrust bearing is used with a propulsion diesel engine to _____.
A. control axial movement of the crankshaft
B. transmit engine thrust to the propeller shaft
C. absorb vibrations in the propeller shafting
D. prevent propeller thrust from being transmitted to the hull

10. Working of Pulse type turbocharger depends upon _____ that can be safely created in the exhaust system
A. Enthalpy drop
B. Pressure difference
C. Turbocharger RPM
D. Pressure Pulse

Section B

Five Questions of 02 Marks each

11. Classify marine engines on the basis of method of charging.
12. Explain the effect of sodium and vanadium presence in marine fuel

13.Explain the causes of the bottom end bearing failures.
14.Describe the procedure of hydraulic method of tightening connecting rod bolts.
15.Explain the term "Turbocharger surging"

Section C

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

16. A. In an ideal otto cycle, 800 KJ/KG heat has been added to air during the constant volume heat addition and 381 kj/kg heat has been removed during the constant volume heat rejection. Calculate the thermal efficiency of the cycle.(5 marks)
16 B. Draw and explain valve timing diagram of 2 stroke engine (5 marks)

17. Draw sectional view of the fuel injector assembly used in marine engines.
18. Draw and explain the purpose of tie-bolts installed in marine diesel engines
19 A. Sketch a stuffing box showing its different parts. (3 marks)
19 B. Describe various clearances measured in the stuffing box assembly and the consequence in running the engine with improper clearance. (3 marks)
19 C. Explain types of forces acting on the guides and guide shoes (4 marks)
20. Describe in detail about various types of main bearing failures.
21. Sketch and explain the exhaust valve fitted on typical 2 stroke propulsion engine.
22 A. Sketch and explain 2-stage turbocharging (5 marks)
22 B. Explain the operation of auxiliary blower and how is it controlled (5 marks)