

Indian Maritime University
(A Central University, Govt of India)
End Semester Examinations– December 2024
Programme Name: B. Tech (ME)
Semester: V
Subject Code: UG11T4502
Subject Name: MARINE INTERNAL COMBUSTION ENGINES AND TECHNOLOGY 2

Date: 09.12.2024

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. What is the main purpose or use of Power Card _____?
 - a) Cylinder volume changes
 - b) Pressure changes during exhaust
 - c) Work done during a cycle
 - d) Peak pressure variations

2. The end of injection in the pump is controlled by _____?
 - a) Moving the barrel insert up and down
 - b) Rotating the plunger
 - c) Adjusting the supply pump pressure
 - d) Using the puncture valve

3. A diesel engine may be hard to start if the _____
 - a) Air intake is restricted
 - b) Engine is cranked too fast
 - c) Vibration dampener is faulty
 - d) Exhaust back pressure is low

4. Regularly taken indicator cards on a slow-speed diesel engine provides relative engine performance data allowing engineers to compare to previous

data and manufacturer's design. What are the two most important parameters obtained from reading the indicator cards?

- a) P_{comp} and injection timing
- b) P_{max} and P_{comp}
- c) P_{max} and injection delay
- d) P_{max} and scavenging air pressure

5. What is the critical speed of an engine?

- a) The maximum speed the engine can reach
- b) The speed at which resonance occurs
- c) The speed at which noise is minimized
- d) The speed at which the engine is most efficient

6. A diesel engine emits blue exhaust smoke as a result of _____.

- a) A light load
- b) Excessive compression pressure
- c) Cold intake air
- d) Excessive cylinder lubrication

7. Governor hunting is caused by _____.

- a) Governor over-control
- b) Insufficient speed droop
- c) Governor under-control
- d) Excessive speed droop

8. Cold corrosion occurs when exhaust temperatures fall below the dew point and react with which element in the fuel?

- a) Oxygen
- b) Nitrogen
- c) Sulphur
- d) Hydrogen

9. Which of the NO_x reduction measure is a secondary method of reduction of noxious emissions in exhaust gases?

- a) Delayed fuel injection
- b) Addition of water to the combustion
- c) Selective Catalytic reduction
- d) Modifying the injector nozzles

10. How is the K value measured in a turbocharger?

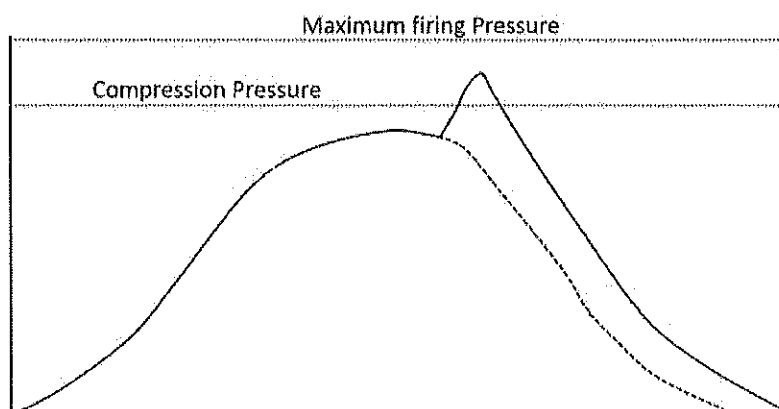
- a) Using a depth vernier
- b) By measuring the diameter of the rotor shaft
- c) Using a magnetic transducer
- d) By checking the labyrinth seal

Section B

Five Questions of 02 Marks each

11. What is the function of interlocks in main machinery operation?

12.



In the above diagram Compression and firing pressure both are lower than normal. List out 4 causes for this to happen.

13. What are the properties required for the L.O used in a trunk piston four stroke marine diesel engine

14. List out various forces & moments in a vertical multi cylinder engine

15. Explain the function of a starting air distributor?

Section C

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

16 a) What is the purpose of Indicator diagrams? With suitable figures explain various defects that can be detected using Indicator diagrams. (7)

b) Explain Fuel index method for calculating engine horse power (3)

17 a) Explain the minimum requirement of automation for UMS operation of ships (4)

b) Explain the working function of electronic governor for main engine with a help of a sketch. (6)

18.a) Explain with neat sketches about Fuel Rack controlled helix type plunger operating principle (7)

b) Discuss the integration of VIT with FQSL for maximum cylinder pressure (3)

19.a) Explain Hydraulic governor with neat sketch (5)

b) Explain about liner wear and its preventive measures (5)

20. a) What are transverse vibrations in large 2 stroke diesel engines? Explain the ways by which we can prevent them in design stag? Give the remedial measures to reduce the same. (5)

b) What do you understand by Microbial Infestation of Lubricating Oil ? Indications to show that Microbial Infestation of Lubricating Oil has occurred and remedial measures to be undertaken to get rid of this infestation (5)

21. a) Write down the steps taken for overhauling of turbocharger (5)

b) Explain the meaning of starting failure in diesel engines and causes of Misfire (5)

22. a) Sketch the crosshead type engine Lubrication system (4)

b) Explain only the main steps during Piston Removal of a large 2 stroke engine (6)