

Indian Maritime University
(A Central University, Govt of India)
End Semester Examinations – December 2022
Programme Name: B Tech (ME)
Semester: VI
Subject Code: UG11T3602
Subject Name: MARINE INTERNAL COMBUSTION ENGINES II

Date: 28.11.2022

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. 1st order vibration is purely due to _____ masses of the engine.
a. Rotating b. Reciprocating c. Auxiliary d. None of these
2. The function of the fuel pump in a marine diesel engine is to execute the following:
a. Meter the quantity of oil b. Time the injection of fuel c. develop high pressure
d. All of these
3. Variable injection timing helps to achieve the following:
a. Fuel economy b. High discharge pressure of fuel c. High compression pressure
d. Low combustion temperature
4. For a propulsion engine with fixed pitch propeller, the air bottle capacity should be able to permit:
a. 12 consecutive starts b. 6 consecutive starts c. 6 consecutive starts alternating in either direction
d. 12 consecutive starts alternating in either direction
5. In a cam operated engine the starting air distributor is used for
a. Timing the start air sequence during cranking b. Regulating the quantity of air during cranking
c. distributing the air amongst all pilot valves d. starting air interlock
6. Reversing of an engine implies
a. Retiming the fuel injection b. Retiming the starting air distributor c. Retiming the firing order
d. All of them.

7. The mean effective pressure of a diesel engine having fixed compression ratio will _____ if volume cut off ratio decreases. Cut off ratio is the volume after combustion to the volume before combustion.

a) increase b) decrease c) remain same d) none of the mentioned

8. You notice the sump level in an engine has increased and no new oil has been added. What action would you take?

- a. Drain some oil from the engine.
- b. Stop the engine and look for a fuel or water leak
- c. Reduced the load, and look after fuel or water leak
- d. Leave it the same

9. Friction developing between the moving parts of a governor, governor linkage and control valve will cause the governor to _____.

- a. has excessive sensitivity to small speed changes
- b. remains in the neutral position
- c. reacts with insufficient speed droop
- d. fail to react to small speed changes

10. Small amounts of moisture are necessary to trigger the growth of microbiological organisms found in some marine fuels. Some sources of water contamination are

- a. tank surface leakage
- b. humidity and condensation
- c. improper tank washing procedures
- d. all the options

Section B

Five Questions of 02 Marks each

11. What is the purpose of struts or bracings?

12. State the role of temperature of fuel in effective combustion.

13. State the role of single helix profile in a port controlled fuel pump.

14. State two reasons for an engine unable to crank on air.

15. State two reasons for an engine unable to reverse its timing.

Section C

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

16. Write short notes on the reasons for carrying out the following and safety measure taken.

- a. Crank web deflection [5]

b. Scavenge Space Inspection [5]

17. An engine is emitting black smoke from the funnel. Discuss the various reasons for the same with respect to the fuel quality, fuel pump, viscosity, timing of injection. [10]

18. Describe the concept of intelligent engines and bring out the advantages of using such engines with respect to fuel consumption, pollution and ease of operation at all loads. [10]

19. With reference to Marine propulsion engine:

- a. State the usage of Starting Air Distributor in starting of a marine diesel engine. [4]
- b. State the usage of a turning gear and its interlock. [3]
- c. Explain with reasons the limitations of using flywheel as method of effective cranking of IC engines. [3]

20. a. If the actual indicator diagram is 36cm^2 and base width of indicator is 10 cm and spring value is $5\text{N/m}^2/\text{cm}$, what will be the mean effective pressure?

b. With the help of suitable diagrams/sketches describe the significance of the following in evaluating the performance/ health of a diesel engine.

- a. Power Card
- b. Draw Card
- c. Light Spring Card

21. With the help of a sketch describe the principle Journal bearing lubrication of a marine diesel engine crankshaft. [10]

22. Write Short notes on the following related to medium speed engines. Answers to be limited to 100 words for each coupling.

- a. FLEXIBLE COUPLINGS [3]
- b. FLUID (HYDRAULIC) COUPLINGS [3]
- c. ELECTROMAGNETIC COUPLINGS [4]

