

Indian Maritime University
(A Central University, Govt of India)
End Semester Examinations – December 2023
Programme Name: B Tech (ME)
Semester: VI
Subject Code: UG11T3602
Subject Name: MARINE INTERNAL COMBUSTION ENGINES II

Date: 14.11.2023

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. Slow speed, multi-cylinder, diesel engines commonly use counterweights placed opposite to the crankpins to _____.
 - a. prevent bearing loads
 - b. provide primary balance by equalizing centrifugal force
 - c. counteract inertia forces
 - d. provide a balance of rocking couples around the crankshaft

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. A large two-stroke/cycle direct reversing diesel engine is to be reversed. Prior to the admission of starting air starting system_____
 - a. lines up the engine for restarting with light diesel oil
 - b. repositions the fuel injection cam
 - c. changes the intake and exhaust valve cam positions
 - d. reduces the main lube oil pressure

4. Peak pressure indicator can measure compression pressure from a particular cylinder ____
- If fuel is shut off from that cylinder
 - If fuel is being injected into that cylinder
 - If the engine is running at normal RPM
 - If the engine is at stop condition
5. To determine if the lube oil filter elements need changing, or cleaning _____.
- open the filter and inspect the elements
 - check the lube oil pump discharge pressure
 - check the lube oil header pressure
 - check the pressure drop across the filter
6. The purpose of the compensating adjustment used in a diesel engine hydraulic governor is to _____.
- compensate for low oil level
 - increase governor promptness
 - prevent governor hunting
 - limit engine load
7. Reversing of an engine implies
- Retiming the fuel injection
 - Retiming the starting air distributor
 - Retiming the firing order
 - All of them.
8. One cause of diesel engine piston ring blow-by is _____.
- reduced scavenging
 - high exhaust temperatures
 - insufficient axial ring clearance
 - floating piston pins
9. Exhaust valve grooving and corrosion is caused by certain components of residual fuel oil. These components are sodium, sulphur, and.
- vanadium
 - carbon
 - copper
 - ash

10. When using low sulphur fuel oil for Emission Control Areas (ECA'S), ideally the TBN of the cylinder oil used should be

- a. Lower than normal
- b. Higher than normal
- c. Same as normal
- d. Same as normal if the feed is kept higher

Section B

Five Questions of 02 Marks each

- 11. What is the purpose of struts or bracings?
- 12. State the role of single helix profile in a port controlled fuel pump.
- 13. Explain how crash reversing is performed.
- 14. Describe the function of Engine coupling in medium speed Engines
- 15. State two reasons for an engine unable to crank on air.

Section C

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

- 16. a). What is power balancing? (3 Marks)
- b). Describe the various sea trails for large 2 stroke Marine Engines(7 Marks)

17. With reference to Marine propulsion engine:

- a.State the usage of Starting Air Distributor in starting of a marine diesel engine. (4 Marks)
- b.State the usage of a turning gear and it's interlock. (3 Marks)
- c.Explain with reasons the limitations of using flywheel as method of effective cranking of IC engines. (3Marks)

- 18. a. Explain the necessity of Fuel Quality Setting (FQS) (3 Marks).
- b. How FQS restores the pressure ratio? (3 Marks)
- c. When and how FQS setting is done? (4 Marks)

19. . 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?

(3Marks)

- b) . With the help of suitable diagrams/sketches describe the significance of the following in evaluating the performance/ health of a diesel engine.
 - i.Power Card, ii.Draw Card, iii) Light Spring Card (7 Marks)

20. a) What are the types of governors based on operating mechanism and function? (5 Marks)
- b) Distinguish between isochronous and variable speed governor.(5 Marks)

21. a. Describe three main properties of trunk piston engine crankcase lubricating oil (3 Marks) .
- b) Write down the major sources of contamination of crankcase oil and their effect on oil and the engine (7 Marks)

22. 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. (10Marks)

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