

INDIAN MARITIME UNIVERSITY
(A Central University)
B.TECH (MARINE ENGINEERING)
DEC 2014 / JAN 2015 SEMESTER EXAMINATIONS
V SEMESTER
MARINE INTERNAL COMBUSTION ENGINE –I (1503)

Time : 03.00 Hrs
Date: 09-12-2014

Max Marks-100
Pass Marks-50

Part-A

ANSWER THE COMPULSORY QUESTIONS
(3 x 10 = 30 Marks)

1. (a) Draw & Discuss the timing diagram of a 4 Stroke Cycle Diesel Engine.
- (b) Define compression Ratio and its effect on Diesel Engine.
- (c) Draw the heat Balance Diagram of a Diesel Engine.
- (d) Explain Ignition Delay and After Burning of Fuel.
- (e) Discuss turbo charger washing of a large Diesel Engine.
- (f) Explain what is a Tuned Exhaust System of a large Diesel Engine?
- (g) State the Advantages of Medium Speed Engines.
- (h) What should be the basic properties of fuel suitable for combustion in Diesel Engine?
- (i) What is critical vibration in the Main Engine system?
- (j) Explain the control of NOX, SOX in Exhaust Emission.

Part-B

ANSWER ANY FIVE FROM THE FOLLOWING QUESTIONS

(14 x 5 = 70 Marks)

2. (a) In what manner does the actual Internal Combustion Engine Cycle differ from the theoretical air cycle? (6 Marks)
- (b) State & Explain different Power Ratings used to distinguish Diesel Engines (8 Marks)

3. What materials are used in the manufacture of Piston Rings for large slow running Diesel Engines? How are these fitted to the Pistons? State the clearances that are necessary and the reasons for these. Give possible causes for failure of piston rings in service. (3+2+5+4 Marks)
4. Sketch and describe the Main Engine Cross head bearing and guide for a large slow running Diesel Engine, showing how the connecting and piston rods are attached. Discuss the bearing clearances and how adequate lubricating oil pressure for the top end bearing is achieved. (8+3+3 Marks)
5. (a) Why is scavenging necessary and how is it obtained? Describe with sketches the methods of scavenging employed in large two stroke Diesel Engines. (7 Marks)
- (b) Discuss supercharging of a Diesel Engine employing Constant Pressures and Pressure Pulse systems. Comment on relative advantages and disadvantages. (7 Marks)
6. Sketch and describe a fuel supply system or a Diesel Engine showing all heaters, filters, pumps, venting system etc. Describe how oil temperature is controlled. (10+4 Marks)
7. Sketch and describe how a main engine piston is cooled. Discuss the advantages and disadvantages of the different cooling media. What are the possible causes of high temperatures piston coolant returns? (6+5+3 Marks)
8. (a) State the causes of Crank Case Explosions in Diesel Engines. What precautions can be taken at sea and in port to minimize the dangers from such explosions? Describe briefly a device which would give warning of dangerous conditions in the crank case. (5+4+5 Marks)
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