

INDIAN MARITIME UNIVERSITY
(A Central University, Government of India)
End Semester Examination Dec 2019/Jan 2020
B.Tech (Marine Engineering)
Semester -V
UG11T3503- Marine Internal Combustion Engine -I

Date: 13.12.2019
Time: 3 Hours

Max Marks: 70
Pass Marks: 35

Part – A (compulsory)

Answer the following (10x2=20 Marks)

1. Briefly explain:
MCR and Overload Rating of a propulsion engine.
2. Explain the purpose of tie-rods on a two stroke engine. What is the purpose of pinching bolts on tie rods?
3. Why is it difficult to lubricate the cross-head bearing of a 2-stroke engine but not difficult in the case of the gudgeon pin in a 4-stroke engine?
4. What is "bore-cooling" of engine components? State which components of an engine are bore cooled.
5. For large two stroke marine diesel engine show cylinder pressure variation with respect to exh. Ports / valve and scavenge ports with the help of graph.
6. What are functions of a turbocharger inducer and diffuser?
7. Exhaust gas leaving the Cylinders of Engines contains lots of energy that can be utilized. How this is achieved onboard Ships?
8. Explain the meaning, and relevance of:
Flash point and Ignition point.
9. What is difference between Cetane Number and CCAI?
10. What are the stroke-to-bore ratios of short-stroke, long-stroke, super-long-stroke, ultra super-long-stroke engines?

Part – B

Answer any 5 out of 7 questions (5 x 10= 50 marks)

11. a) Describe the 4-stroke engine cycle of operation, with the help of a timing diagram. (7 marks)
- b) Why is "tappet clearance" necessary in the 4 stroke engine? (3 marks)
12. a) Sketch & describe a hydraulically operated Exhaust valve for a large two stroke engine. (7 marks)
- b) Why is rotation of the valve during operation, necessary and how it is done? (3 marks)
13. a) With basic sketch show the components of a cross-head in a large 2-stroke Engine. (7 marks)
- b) What is the purpose of a cross-head? (3 marks)
14. a) Explain Cross scavenge and Uniflow scavenge system with its advantages and disadvantages. (7 marks)
- b) Give a detail block diagram of a scavenge manifold showing auxiliary blowers and non-return valves of a large two stroke diesel engine. (3 marks)
15. a) For a four stroke engine with pulse type turbocharging system, generally exh. Tuning (grouping) is required for more than three cylinders engine- explain. (7marks)
- b) Explain turbocharger surging. (3 marks)
16. a) Sketch and describe a fuel oil system for a Main Propulsion Diesel Engine. (7 marks)
- b) Explain importance of Diesel Engine cooling water chemical treatment? (3 marks)
17. a) For a large two stroke engine, how scavenge fire takes place and what are the precautions? (7 marks)
- b) What is uptake fire? (3 marks)
