

INDIAN MARITIME UNIVERSITY
(A Central University, Government of India)

May/June 2017 End Semester Examinations
B. Tech (Marine Engineering – Sixth Semester)

Marine Internal Combustion Engine – II
UG11T 2602/UG11T 1602

Date: 14.06.2017
Time: 3 Hrs

Maximum Marks : 100
Pass Marks : 50

PART A **10x3=30 Marks**
(All questions are compulsory)

1.
 - a) State and define the three basic types of vibrations that act on the engine when it is in operating condition.
 - b) State and define any three functions of a fuel oil injection system employed in Marine diesel engine.
 - c) State with reason any three faults which cause immediate shut down of the marine propulsion diesel engine.
 - d) State three important factors to be considered while carrying out power balancing of a marine diesel engine.
 - e) State three important objectives of lubricating oil in a marine diesel engine.
 - f) State the purpose of the trunk/skirt in a four stroke diesel engine.
 - g) State why is it easier to lubricate the gudgeon pin of a four stroke engine as compared to the crosshead pin of a two stroke diesel engine.
 - h) Non reversible type of engines need less number of consecutive air starts as per SOLAS requirement. Justify the statement.
 - i) Turning gear interlocks are safety devices fitted in the starting air circuit. Justify the statement.
 - j) State the need of reduction gear for 4-stroke marine propulsion engines as compared to 2-stroke diesel engines.

PART B

(5 x14 = 70 Marks)

(Answer any FIVE questions)

2. Explain the following fuel injection systems with neat sketches.
 - a). Jerk system (Unit injection system) (7 Marks)
 - b). Common rail system. (7 Marks)

3. Explain the maintenance procedures for diesel engine with respect to the following.
 - a). Crankshaft deflection. (7 Marks)
 - b). Engine holding down arrangements. (7 Marks)

4. With the help of indicator diagrams, explain how the following faults on engine are explicit and give reasons for the fault? The diagrams to be superimposed over a normal curve. (7x2=14 Marks)
 - a) Early fuel injection.
 - b) Late fuel injection.
 - c) Choked scavenge ports.
 - d) Worn piston rings.
 - e) Piston crown burned out.
 - f) Ignition delay due to bad quality of fuel.
 - g) Leaky exhaust valve.

5. Explain the significance of NO_x control with reference to MARPOL annex – VI. Discuss various NO_x control techniques employed on modern engines. (14 Marks)

6. Explain cylinder liner wear in 2-stroke diesel engines.
 - a). State various preventive measures. (7 Marks)
 - b). Discuss the importance of used lubricating oil analysis for diesel engines. Explain how the engine condition is monitored through analysis reports. (7 Marks)

7. a). List down merits and demerits of gas turbines used for marine propulsion. (5 Marks)
- b). Explains various safeties incorporated in main engine starting air system. (9 Marks)
8. a). State the requirements for Unattended Machinery Space (UMS) Ship with respect to protection against fire, flooding and control of machinery and loss of power etc., (7 Marks)
- b). What is an intelligent engine. Compare it with conventional IC engine and discuss the challenges including advantages. (7 Marks)
