INDIAN MARITIME UNIVERSITY

(A Central University, Government of India)

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

<u>Marine Internal Combustion Engine – I</u> <u>UG11T 2503/UG11T 1503</u>

Date: 03.07.2017	Maximum Marks	: 100
Time: 3 Hrs	Pass Marks	: 50

<u> PART – A</u>

10X3=30 Marks

(All questions are compulsory)

- 1. (a) Define Mean Piston Speed and List down the constraints for increasing it.
 - (b) What is the purpose of Tie Bolts in a large 2 stroke Diesel Engine?
 - (c) Why 2 stroke Cross Head Engine is fitted with Guide Shoe?

(d) Name the various types of scavenging in a 2 Stroke Diesel Engine?

- (e) What is Super Charging of Diesel Engines?
- (f) What is the minimum compression ratio required in a Diesel Engine and why?
- (g) Name the various cooling medium used for cooling the different parts of a Marine Diesel Engine.
- (h) Name the various grades of fuel oil used for Marine Diesel Engines.
- (i) Explain how a primary explosion in a crank case can trigger a secondary explosion.
- (j) What are the implication of Stroke Bore Ratio in Diesel Engines.

PART – B

5X14=70 Marks

(Answer any 5 of the following)

- 2. (a) Draw and Explain a 4 Stroke Diesel Engine Valve Timing Diagram (crank angle diagram) with respect to Indicator Diagram (PV diagram). (10 Marks)
 - (b) State and Explain different Power Ratings used to distinguish Diesel Engines. (4 Marks)

- 3. (a) Explain the working of a Hydraulically Operated Main Engine Exhaust Valve with a simple diagram (PV diagram. (10 Marks)
 - (b) Explain the differences between Pulse and Constant Pressure Turbo charging system? (4 Marks)
- 4. (a) Explain the Turbocharger of Large 2 stroke Diesel Engine with a simple diagram. (10 Marks)
 - (b) What is the purpose of the Labyrinth Seal in a T/C. (4 Marks)
- 5. (a) Sketch and describe a Fuel Oil System of a Large Marine Diesel Engine, from Settling Tank to Main Engine Fuel Injectors. (10 Marks)
 - (b) Explain Ignition Delay and After Burning in a Marine Diesel Engine.

(4 Marks)

- 6. (a) Explain the various means of reducing SOx emission from Marine Diesel Engines. (7 Marks)
 - (b) Explain the various means of reducing NOx emission from Marine Diesel Engines. (7 Marks)
- 7. (a) Draw a neat sketch of a Cylinder Liner of a Large 2 Stroke Marine Diesel Engine where bore cooling method is used. (10 Marks)
 - (b) Explain why Chemical Treatment of Main Engine Jacket Cooling Water is necessary? (4 Marks)
- 8. (a) Explain how Starting Air Line Explosion can take place in a Large Marine Diesel Engine. (4 Marks)
 - (b) What are the Safety Devices fitted to prevent a Starting Air Line Explosion? Explain the operating principle of each device.

(10 Marks)
