

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

**May/June 2016 End Semester Examinations**  
**B.Tech. (Marine Engineering)**

**Fifth Semester – Marine Internal Combustion Engine- I (UG11 T1503/ T2503)**

**Date : 25.06.2016**

**Time: 3 Hrs**

**Max Marks : 100**

**Pass Marks: 50**

**Part-A**

**(3 x 10 = 30 Marks)**

**Compulsory Question**

- 1) a) Why air cooler is used in Marine Diesel Engine?
- b) Illustrate three relative advantages of two stroke and four stroke type engines.
- c) Explain why bore cooling system is preferred in modern engines?.
- d) What are the constraints to increase the engine mean piston speed?
- e) How mist detectors become a safety device for a running diesel engine?
- f) Draw the heat Balance Diagram of a Diesel Engine.
- g) Draw timing diagram of a 2-Stroke Diesel Engine and name the processes of the complete cycle.
- h) Why tie rods are used for Marine Diesel Engines ?
- i) What are the various impurities generally found in Heavy Fuel oil used in large 2-stroke Diesel Engine. ?
- j) What are the various methods used for control of NOx emission in diesel engine.

**Part-B**

**(14 x 5 =70 Marks)**

**Answer any Five Questions**

- 2) Sketch and describe a constant pressure turbo charging system. Give its advantages and disadvantages. What is the maintenance required to maintain its efficiency?  
(4+4+6 Marks)
- 3) Sketch a simple line diagram for a main engine Jacket cooling water system with auto temperature control.  
Explain the maintenance require for a cooling unit. (10+4 Marks)
- 4) List the various factors which lead to Main engine start air line explosion. What are the indications prior to the explosion? What are the safety features incorporated in the system to avoid explosion. (4+4+6 Marks)
- 5) 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)
- 6) What is “scavenging” in diesel engines? What are the different types of scavenging employed for marine diesel engines? Briefly explain two of those systems along with their merits and demerits. (3+4+7 Marks)

- 7) What is super charging for a modern two stroke engine? How is it done and what are the benefits? What maintenance need to be carried out and how it is done to keep the machinery efficient. (2+4+8 Marks)
- 8) What are the different types of heat exchangers used for marine machineries? Show the heat exchanger location in Main engine jacket cooling fresh water system along with the temperatures at terminal points. What are the materials used for construction of the heat exchanger. (2+8+4 Marks)

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