

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

May/June 2015 End Semester Examinations

SEMESTER – V, B.TECH (MARINE ENGINEERING)

MARINE INTERNAL COMBUSTION ENGINE – I (T 1503)

Date : 11.06.2015
Time: 3 Hrs

Maximum Marks: 100
Pass Marks : 50

Part-A
Compulsory Question

(3x10=30 Marks)

1. Explain the following with valid reasoning -
 - a) Why air cooler is used in heat engine?
 - b) Why engine peak pressure is a design limitation though the metallurgical development has taken place for construction of engine components.
 - c) What is volumetric efficiency in diesel engine? How it affects the engine efficiency?
 - d) Illustrate three relative advantages of cross head and trunk piston type engines.
 - e) What is engine Indicated, Break and Rated power.
 - f) Scavenge air pressure is required for higher engine output. Explain.
 - g) Why chemical treatment of Main engine Jacket cooling water is necessary?
 - h) What is Bosch type fuel pump, idle stroke and pump stroke?
 - i) Why engine exhaust gas emission is necessarily controlled in all modern engines.
 - j) How primary explosion in a crank case can trigger a secondary explosion.

Part –B **(5x14=70 Marks)**
Answer any five of the following.

2. Draw a Timing diagram of a 2-Stroke Diesel engine and explain those thermodynamics process in that cycle. What are the advantages of 2-Stroke Diesel engine over 4-stroke. **(7+7 = 14)**
3. What is SAC Volume of an injector? Draw a fuel injector and label. Explain its operating principle? **(2+8+4=14)**

4. Name the different components of a Turbo Charger used in marine propulsion engine with the purpose of each components. **(14)**
5. What is super charging in diesel engines? What are the different types of Super Charging employed for 2- stroke marine diesel engines? Briefly explain those systems along with their merits and demerits. **(2+4+8= 14)**
6. Discuss each of the following terms and explain its relevance to internal combustion
- | | | |
|----------------|-----------------------|-------------|
| a) Atomization | b) Penetration | |
| c) Viscosity | d) De emulsification. | (14) |
7. Why oil mist detector is used in Diesel engine? What are the different types of mist detector in use and explain working principle and application of any one. **(4+10= 14)**
8. What are the different grades of residual bunker fuel oil and their differences? How bunker fuel oil is prepared on board for efficient combustion **(6+8=14)**
9. How starting air line explosion can take place in a large marine Diesel engine system? What are the safety devices fitted to prevent it? Explain operating principle of each device. **(6+8 =14)**
