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***B.Tech. Degree V Semester Examination in
Marine Engineering December 2018***

MRE 1504 MARINE INTERNAL COMBUSTION ENGINES I

(2013 Scheme)

Time : 3 Hours

Maximum Marks : 100

(5 × 20 = 100)

- I. (a) What are the advantages of two stroke engines over 4 stroke engines and reason for selecting 2 stroke engine for main propulsion engine. (10)
 (b) Draw valve timing diagram of 4 stroke engine and explain lead, lag and overlap. (10)
- OR**
- II. (a) Explain the functions of Tie rod and the engine components tied together by Tie rod. (8)
 (b) What are the cylinder head mountings of 2 stroke engine? Sketch an air starting valve and explain its working. (12)
- III. (a) Explain with sketch uniflow, cross and loop scavenging. Explain their advantages and disadvantages. (10)
 (b) Explain the working of turbochargers. What is meant by turbocharger surging and explain the reason. (10)
- OR**
- IV. (a) Sketch and describe the working of two stage turbocharger and explain its advantages. (12)
 (b) Explain advantage and disadvantage of constant pressure turbocharging. (8)
- V. Sketch and describe a fuel valve and explain atomization, penetration and dripping. (20)
- OR**
- VI. Write short notes on: (20)
 (i) SOX and NOX emission in exhaust gas
 (ii) Mean piston speed of an engine
 (iii) MCR and CSR of an engine
 (iv) Early injection and late injection and its effects on engine.
- VII. (a) Explain, with line diagram, the main engine jacket cooling water system and why the expansion tank is provided in the system. (10)
 (b) What is meant by scavenge fire and the reason for the fire? What action is to be taken when scavenge fire occurs? (10)
- OR**
- VIII. (a) What is the advantage of super long stroke engine? Why crosshead guide and shoe is provided in two stroke engine? (8)
 (b) Explain Annealing, Normalizing, Tempering and Surface Hardening. (12)
- IX. (a) Explain Longitudinal vibration, Axial vibration and Torsional vibration. (12)
 (b) What is meant by axial damper and how it is functioning? (8)
- OR**
- X. (a) Explain a spill valve type of fuel pump and how the metering of fuel is carried out. (10)
 (b) How the viscosity is measured and controlled in fuel system. What is meant by Viscosity Index? (10)