B.Tech. Degree V Semester Examination in Marine Engineering December 2019

MRE 1504 MARINE INTERNAL COMBUSTION ENGINES I
(2013 Scheme)

Time: 3 Hours   Maximum Marks: 100

(5 × 20 = 100)

I. (a) Sketch and explain a cylinder liner used in a large two-stroke crosshead type engine. (12)

(b) Explain the timing diagram of 2-stroke and 4-stroke engine cycles. (8)

OR

II. (a) Sketch and describe a piston used in a large two-stroke crosshead type engine. (14)

(b) Explain the different piston cooling media used. (6)

III. (a) Describe the different types of scavenging used in marine two-stroke diesel engines along with their merits and demerits. (10)

(b) Explain the pulse and constant pressure systems of turbocharging along with their advantages and disadvantages. (10)

OR

IV. With the help of a neat sketch explain the constructional details and functions of each component of a turbocharger used in marine diesel engines. (20)

V. Explain the various methods adopted to control NOx emissions from marine diesel engines. (20)

OR

VI. (a) Explain the process of combustion enumerating different phases of combustion. (8)

(b) Write short notes on: (12)
   (i)Atomization (ii)Penetration (iii)Turbulence (iv) Sac volume

VII. Write short notes on: (20)
   (i) Scavenge fire (ii) Uptake fire

OR

VIII. (a) Explain the term crankcase explosion with regard to a marine diesel engine. (10)

(b) Sketch and describe the types of oil mist detectors used in marine diesel engines. (10)

IX. (a) Explain the significance of varying the fuel injection timing on a marine diesel engine. (4)

(b) Sketch and describe a spill valve type fuel pump with provision for varying the injection timing and the quantity of fuel injected. (16)

OR

X. (a) Discuss the purpose of VIT and explain with the help of a VIT system drawing, how it is achieved. (8)

(b) Sketch and explain how variable injection timing is achieved in a helical groove type fuel pump. (12)

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