

***B.Tech. Degree V Semester Examination in Marine Engineering  
December 2012***

**MRE 504 MARINE INTERNAL COMBUSTION ENGINES I**

Time: 3 Hours

Maximum Marks: 100

- I. (a) Make a comparative study on 4-stroke and 2-stroke engine features. (10)  
(b) Draw timing diagram of 4-stroke cycle engine and explain in detail. (10)  
**OR**
- II. (a) Sketch and describe a 2-stroke diesel engine piston with significant of each component. (15)  
(b) Specify the material used for manufacturing of piston, pistonning, piston rod of a 2-stroke diesel engine. (5)
- III. (a) Which are the methods of scavenging in 2-stroke diesel engine? Sketch and describe using a piston scavenging method. (12)  
(b) Describe the importance and functions of Tie-rod in diesel engine assembly. (8)  
**OR**
- IV. What are the advantages of supercharging? Sketch and describe a turbocharger used in main engine. (20)
- V. (a) Sketch and describe a fuel injector of a large marine diesel engine. (12)  
(b) Describe the overhauling procedure of fuel injector. (8)  
**OR**
- VI. Write notes on: (20)  
(i) Control of NOX and SOX in exhaust  
(ii) Ignition quality of fuel  
(iii) Reasons and effects for variation in compression pressure and peak pressure  
(iv) Effects of ignition delay and after burning in an engine.
- VII. (a) Sketch and describe cooling system of a 2-stroke diesel engine piston. (10)  
(b) Discuss the developments and merits of long stroke diesel engine. (10)  
**OR**
- VIII. Draw a neat sketch of crank case explosion door of marine diesel engines. What are the preventive methods taken against crank case fire? (20)
- IX. Draw a cross section of jerk type fuel pump and describe its function. Explain how stepless regulation of fuel is attained in jerk type fuel pump. (20)  
**OR**
- X. Write notes on: (20)  
(i) Thermal balancing  
(ii) Carburizing  
(iii) Variable fuel injection system  
(iv) Fuel oil treatment in marine engine practice