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***B.Tech. Degree V Semester Supplementary Examination in
Marine Engineering December 2017***

MRE 504 MARINE INTERNAL COMBUSTION ENGINES I

(Prior to 2013 Scheme)

Time: 3 Hours

Maximum Marks: 100

(5 × 20 = 100)

- I. (a) With the help of a heat balance diagram explain thermal efficiency of a diesel engine. (12)
 (b) What are the commonly used methods to improve the overall thermal efficiency of a marine diesel engine? (8)
- OR**
- II. (a) Explain Valve timing diagram of a two stroke engine. (12)
 (b) Evaluate the suitability of a slow speed diesel engine for marine propulsion purpose. (8)
- III. (a) Explain the terms naturally aspirated and Turbo charged engine. Explain the difference by using their indicator diagram. (12)
 (b) What is the function of an inter cooler used in a supercharged engine? (8)
- OR**
- IV. (a) Explain the relative merits and demerits of pulse and constant pressure type of supercharging arrangements. (10)
 (b) Sketch and describe the scavenging and supercharging arrangement of a large two stroke diesel engine. (10)
- V. (a) Explain the process of preparation of fuel for efficient combustion in a marine diesel engine running with HFO-380 cst. (15)
 (b) Mention the important properties and parameters of the fuel at various stages of above process. (5)
- OR**
- VI. (a) What are the reasons for variation of compression pressure and peak presence in a particular unit of a diesel engine? (10)
 (b) Briefly explain various methods employed for: (10)
 (i) NOx control in Marine engine.
 (ii) SOx control in Marine engine.
- VII. (a) Sketch and describe a Jacket cooling water system for a large marine diesel engine. (10)
 (b) How are the liner cooling and cylinder head cooling done? (5)
 (c) What are the maintenance routines done to maintain the quality of the cooling water? (5)
- OR**
- VIII. (a) Explain starting air line explosion. How to avoid its occurrence? (10)
 (b) Sketch and describe an Oil mist detector. (10)
- IX. (a) Sketch and describe a jerk type fuel pump with Helical groove. (12)
 (b) How is speed control of a diesel engine achieved? (8)
- OR**
- X. (a) What are the different types of vibrations produced by a diesel engine? What are the causes of the same? (10)
 (b) Explain how the fuel pumps are capable for metering the quantity of fuel being injected. (10)