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***B.Tech. Degree VI Semester Examination in Marine Engineering  
May 2019***

**MRE 1604 MARINE INTERNAL COMBUSTION ENGINES II  
(2013 Scheme)**

Time: 3 Hours

Maximum Marks: 100

(5 × 20 = 100)

- I. Explain with the help of relevant sketches how starting and reversing is achieved in a large two stroke marine diesel engine. (20)
- OR**
- II. (a) Explain the following: (4 × 4 = 16)
- (i) Power card
- (ii) Compression diagram
- (iii) Draw card
- (iv) Light spring diagram
- (b) What are the interlocks provided to safeguard a marine diesel engine? (4)
- III. (a) Discuss the suitability of medium speed engines for use onboard merchant ships? (12)
- (b) Briefly explain the concept of Intelligent engine. (8)
- OR**
- IV. Explain various methods of control of NOx emission from marine diesel engines. (20)
- V. (a) Explain the procedure for taking crankshaft deflection. What is the significance of taking this deflection measurements? (12)
- (b) Discuss about the microbial degradation of lube oil in the sump with reasons, symptoms and preventive measures. (8)
- OR**
- VI. (a) Discuss the improvements in design by various engine makers which led to increase in the time between overhauls. (12)
- (b) Explain the requirements for UMS operation of ships as per SOLAS. (8)
- VII. (a) Sketch and explain the working of a compressed air motor. (10)
- (b) Explain pre-whirl and pre-whirl vanes with regard to centrifugal compressors. (10)
- OR**
- VIII. Sketch and describe a centrifugal compressor and compare the same with reciprocating compressor for main engine starting air duties. (20)
- IX. (a) Sketch and describe a free piston engine gasifier. (10)
- (b) Compare this with a conventional air-stream combustion chamber. (10)
- OR**
- X. (a) Sketch and explain the Joule-Brayton cycle gas turbine plant. (10)
- (b) Enumerate the different methods adopted for improvement of thermal efficiency of a gas turbine plant. (10)