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***B.Tech. Degree VI Semester Supplementary Examination in
Marine Engineering June 2016***

MRE 604 MARINE INTERNAL COMBUSTION ENGINES - II

Time : 3 Hours

Maximum Marks : 100

(5 × 20 = 100)

- I. (a) Sketch and describe starting and reversing system of a large 2-stroke marine diesel engine used for propulsion. (10)
- (b) Describe safety interlocks and cut outs incorporated with main engine. Also describe about the effect of critical speed on engine running. (10)
- OR**
- II. (a) Describe in detail the purpose of taking a Power card and Draw card. Explain the procedure of taking these cards while engine is running. What is meant by power balancing? (10)
- (b) Enumerate the additives used in lubricating oil to enhance its properties. How do you evaluate the water contamination in Lubricating oil using oil analysis? (10)
- III. (a) How do you classify high speed, medium speed and low speed engine in marine plant? Describe about the developments adopted in exhaust valve design of a marine engine. (10)
- (b) Describe the function of an engine over speed governor. How do you achieve effective Nox control of Marine Diesel Engine? (10)
- OR**
- IV. With respect to diesel engines write notes on : (5 × 4=20)
- (i) Early injection (ii) Late Injection (iii) After burning
(iv) Time between overhauls (v) Injection quality.
- V. (a) What are the indications of crank shaft misalignment? Enumerate the causes for crankshaft misalignment. (10)
- (b) Describe any one method for measuring crankshaft alignment and the method of recording the readings. (10)
- OR**
- VI. (a) Describe in detail about the requirements of UMS operations in a ship. (11)
- (b) Explain with the aid of sketches the following controls in automation. (3×3=9)
- (i) Proportional Control. (ii) Integral Control.
(iii) Derivative Control.

VII. Sketch and describe a rotary type air compressor and compare with reciprocating compressor for starting air duties of a marine main engine. Explain the function of an intercooler. Draw work loss or gain diagrams while incorporating an intercooler. (20)

OR

VIII. (a) Sketch and describe working principle and operation of a variable speed hydraulic governor. (12)

(b) Discuss on intelligent engine (cam less concept) and its merits and demerits. (8)

IX. (a) Explain the functioning of combustion section of Gas Turbine and its principle with the help of a sketch. (10)

(b) Describe Free Piston Engine Gasifier. (10)

OR

X. Write notes on *any four* of the following. (20)

- (i) Engine holding down arrangement.
- (ii) Slip and slip factor of a centrifugal compressor.
- (iii) Combined gas and steam turbine.
- (iv) Intercooled regenerative gas turbine.
- (v) Re-heat arrangement in gas turbine.
- (vi) Joule-Brayton cycle.