B. Tech Degree VI Semester Examination in Marine Engineering July 2010

MRE 604 MARINE INTERNAL COMBUSTION ENGINES II

Time : 3 Hours | Maximum Marks : 100

I. What are the different methods of starting a diesel engine? Sketch and describe a main engine starting and reversing system of a large two stroke diesel engine. What are the safety inter locks in the system and what is meant by critical speed? (20)

OR

II. (a) Sketch and describe an Air Starting Valve fitted on the cylinder head of a large two stroke diesel engine. (10)

(b) Sketch and describe an Automatic Starting Air Valve fitted between the Air Bottle and the engine. What is the purpose of fitting this valve in the starting air line? (10)

III. Describe the method of taking the indicator diagram of a two stroke diesel engine. With the help of an indicator diagram describe how the following defects can be identified in a two stroke marine diesel engine:
(i) Early injection (ii) Late injection (iii) Leaky fuel injector
(iv) After burning (20)

OR

IV. Write short notes on any **FIVE** of the following properties of fuel oils:
(i) Viscosity (ii) Specific Gravity (iii) Calorific Value
(iv) Flash Point (v) Ignition Quality (vi) Pour Point
(vii) Carbon Residue (20)

V. What are the requirements of UMS operations of ships and explain with the help of sketches the following controls in automation?
(a) Proportional control (b) Integral control (c) Derivative control (20)

OR

VI. (a) Discuss on possible reasons for crank shaft misalignment in a marine diesel engine. (10)

(b) Describe the procedure of proper crank shaft alignment while installing a new diesel engine in a ship. (10)

VII. Sketch and describe a rotary type air compressor and compare the same with reciprocating compressor for starting air duties of main engine. Why inter coolers are fitted in an air compressor? Explain the importance of measuring clearance volume of a compressor after overhaul. (20)

OR

VIII. Sketch and describe the working principles and operation of a variable speed hydraulic governor and explain what is hunting and speed droop. Why is over speed governor fitted on diesel engines? (20)

IX. a. With the aid of a simple sketch describe the salient features and functioning of combustion section of a Gas Turbine. (10)

b. Describe Free Piston Engine Gasifier. (10)

OR

X. Write short notes on any **FOUR** of the following:
(i) Intelligent engine concept
(ii) Engine holding down arrangements
(iii) Slip and slip factor of centrifugal compressors
(iv) Electronic governor
(v) Use of additives in lubricating oils
(vi) NOX – Control of marine diesel engines (4 x 5 = 20)

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