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B.Tech. Degree V Semester Supplementary Examination in Marine Engineering December 2015

MRE 502 MARINE BOILERS AND STEAM ENGINEERING

Time: 3 Hours

Maximum Marks: 100

(5 × 20 = 100)

- I. (a) Describe the advantages and disadvantages of water tube boilers over fire tube boilers. (8)
(b) Sketch and describe a Clarkson Thimble tube boiler. Mark all important dimensions. (12)
- OR**
- II. (a) Describe in brief the classification societies requirements for boiler construction. (8)
(b) Sketch and describe a Babcock and Wilcox 'D' type boiler used on board ships. (12)
- III. (a) Describe with a neat sketch Cochran single pass composite boiler. (10)
(b) Write short notes on (i) Single plate glass water level indicator (ii) low water level alarm and fuel shut off valve. (10)
- OR**
- IV. (a) Sketch and describe La Mont exhaust boiler. (10)
(b) Write short notes on (i) cross blowing through of boiler gauge glass (ii) Different methods used to control the superheat temperature of steam in water tube boilers. (10)
- V. (a) Explain the different methods used for laying up of a boiler. (10)
(b) Why and when hydraulic test is done in a boiler and explain the procedure for doing the same. (10)
- OR**
- VI. (a) Sketch and explain pressure jet type of burners used in boiler and their disadvantages. (10)
(b) Describe in detail the purpose of refractory, types of refractory and the reason for failure of the same. (10)
- VII. Describe the important components of a modern steam turbine used on board a ship. (20)
- OR**
- VIII. (a) What are the materials used for making the various components like blades, rotors, casings, sealing glands, gears of a steam turbine and explain their justification. (8)
(b) Write short notes with line sketches on (i) types of blades used and method of fixing them for impulse and steam turbines (ii) labyrinth packing glands. (12)
- IX. Describe the various types of condensers used in a steam plant. Sketch and describe a regenerative type condenser and explain its advantages over others. (20)
- OR**
- X. (a) Explain the main objects of warming up a steam turbine and detail out the procedure for warming up. (10)
(b) Sketch and describe the lubricating oil system used for a steam turbine and gear box. (10)