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***B.Tech. Degree V Semester Examination in Marine Engineering
December 2014***

MRE 502 MARINE BOILERS AND STEAM ENGINEERING

Time : 3 Hours

Maximum Marks : 100

(5 x 20 = 100)

- I. (a) Explain in brief the different types of marine boilers used on board merchant ships. (6)
- (b) Sketch and describe Clarkson Thimble tube boiler. Mark all dimensions. (14)
- OR**
- II. (a) Describe in brief the various destructive and non destructive tests carried out on plates and rivets used for boiler construction. (6)
- (b) Sketch and describe a Foster Wheeler ESD-I type boiler used on board ships. (14)
- III. (a) Explain the cochran single pass composite boiler with a neat sketch. (10)
- (b) Write short notes on (i) tubular type gauge glass (ii) main stream stop valve. (10)
- OR**
- IV. Write short notes on (i) spary type de-super heater (ii) horizontal tube type air heater (iii) low water level alarm (iv) forced water circulation boiler. (20)
- V. (a) Explain the need for blowing down a boiler and also describe how the blowing down is done. (8)
- (b) Explain in detail why and when hydraulic tests are done for a boiler and describe the procedure for doing the same mentioning the test pressures used. (12)
- OR**
- VI. (a) What are the different types of refractory used in a boiler and why they are used? (8)
- (b) Describe the process by which a residual fuel is burnt in a boiler furnace with a sketch (12)
- VII. Sketch and describe the general lay out of a modern steam turbine plant including the auxiliaries. (20)

OR

(P.T.O.)

- 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. (20)

OR

- X. Write short notes on (20)
- (i) procedure for warming through a turbine plant
 - (ii) emergency controls and emergency operation of turbines
 - (iii) vibration in marine steam turbine
 - (iv) break downs and fault finding of steam turbines.
