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

MRE 1502 MARINE BOILERS AND STEAM ENGINEERING

Time: 3 Hours

Maximum Marks: 100

(5 × 20 = 100)

- I. (a) Explain in brief, the different types of fire tube and water tube boilers used on board merchant ships. (6)
- (b) Sketch and describe a Cochran boiler. Mark all important dimensions. (14)
- OR**
- II. (a) Describe in brief the various destructive and nondestructive tests carried out on plates and rivets used for boiler construction. (6)
- (b) Sketch and describe a Foster Wheeler ESD-II type boiler used on board ships. (14)
- III. (a) Explain with a neat sketch La Mont forced circulation water type boiler. (10)
- (b) Write short notes on: (10)
- (i) Water level guage-IGEMA type.
- (ii) Improved high lift safety valve.
- OR**
- IV. Write short notes on: (20)
- (i) Spray type de-super heater.
- (ii) Vertical tube type air heater.
- (iii) Low water level alarm.
- (iv) Double evaporation type boiler.
- V. (a) Explain the need for blowing down a boiler and also describe how the blowing down is done. (8)
- (b) Explain in detail the important points to be noted for the safe and proper operation of the boilers. (12)
- OR**
- VI. (a) What are the different types of refractory used in a boiler and why are they used? (8)
- (b) Describe with a sketch the process by which a residual fuel is burnt in a boiler furnace. (12)
- VII. Describe the important components of a modern steam turbine used on board a ship. (20)
- OR**
- VIII. (a) Explain the effect of alloying steel for making the various components like blades, rotors, casings, sealing glands and gears of a steam turbine. (8)
- (b) Write short notes with line sketches on: (12)
- (i) Diaphragms.
- (ii) Journal bearings.
- (iii) Labyrinth packing glands of a steam turbine.
- IX. (a) Sketch and describe a regenerative type condenser and explain its advantages over others. (14)
- (b) Explain briefly vibration in marine steam turbine. (6)
- OR**
- X. (a) Explain the main reasons for working up a steam turbine and detail out the procedure for the same. (10)
- (b) Describe the two different methods used for steam turbine governing and explain any one of them with a sketch. (10)