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***B.Tech. Degree V Semester Examination in
Marine Engineering December 2017***

**MRE 1502 MARINE BOILER AND STEAM ENGINEERING
(2013 Scheme)**

Time : 3 Hours

Maximum Marks : 100

(5 × 20 = 100)

- I. Sketch and describe a typical water tube boiler used on board a ship. Make a comparison between water tube and smoke tube boilers. (20)
- OR**
- II. (a) Explain the destructive and non-destructive tests carried out on plates and rivets used for boiler construction. (8)
- (b) Sketch and describe an ESD-II-D type water tube boiler. (12)
- III. With the help of a neat sketch explain a Cochran single pass composite boiler. Prepare a line diagram showing how the exhaust gas boiler is connected to the auxiliary boiler onboard a ship. (20)
- OR**
- IV. Write short notes on the following:
- (a) Improved high lift safety valve. (12)
- (b) Boiler gauge glass. (8)
- V. Explain the maintenance carried out on a water tube boiler. Also explain the inspection procedure and survey requirements of such a boiler. (20)
- OR**
- VI. Explain the various methods used for laying up of a boiler. Also explain the procedure of raising steam from a boiler in cold condition. (20)
- VII. Draw a general layout of a steam turbine plant onboard a ship and explain the various components and auxiliaries. (20)
- OR**
- VIII. (a) Explain the working principle of an impulse turbine and a reaction turbine. (8)
- (b) Write short notes on the following:
- (i) Labyrinth glands in a steam turbine. (4)
- (ii) Types of blades and methods of fixing. (8)
- IX. Explain the constructional details of a typical condenser used in a marine steam plant with the help of a neat sketch. Explain how a leaking tube can be identified. (20)
- OR**
- X. Write short notes on the following:
- (a) Balancing of turbine rotor. (5)
- (b) Sliding foot. (5)
- (c) Vibration in steam turbine. (5)
- (d) Procedure of warming through a turbine plant. (5)