



## ***B. Tech Degree V Semester Examination in Marine Engineering, June 2009***

### **MRE 502 MARINE BOILER AND STEAM ENGINEERING**

Time : 3 Hours

Maximum Marks : 100

- I a) What are the different types of boilers used onboard a ship? (6)  
 b) Compare smoke tube boilers and water tube boilers. (4)  
 c) Describe in detail the various destructive and non destructive tests done on boiler plates, rivets and weld seams. (10)
- OR**
- II Sketch and describe a ESD-I type of water tube boiler used on board. Indicate the dimensions of all tubes. (20)
- III Sketch and describe a composite type of double pass Cochran boiler. (20)
- OR**
- IV Write short notes on the following:  
 i) Full lift and full bore type of safety valves (8)  
 ii) Double evaporator boiler (8)  
 iii) Economizer (4)
- V Sketch and explain the system and process by which residual fuel oil is burnt in a boiler furnace. (20)
- OR**
- VI Write short notes on the following:  
 i) Hydraulic test of a boiler (8)  
 ii) Pressure jet type of fuel oil burner (8)  
 iii) Purpose and types of refractory lining inside water tube boiler (4)
- VII a) Enumerate the difference between reciprocating steam engine and steam turbine. (8)  
 b) Sketch and describe the layout of a modern geared steam turbine plant. (12)
- OR**
- VIII Sketch and describe a turbine rotor attached with blades, gland seals and gears. (20)
- IX Describe in detail the construction of a steam condenser with it's mounting. (20)
- OR**
- X Write short notes on following: (5 x 4 = 20)  
 i) Double flow condenser  
 ii) Steam condenser leak testing methods.  
 iii) Expansion allowances of turbine and it's sliding foot  
 iv) Dynamic balancing of rotor.