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**B. Tech**  
**CPMR 8408**

## **Eighth Semester Examination – 2008**

### **MARINE BOILER AND STEAM ENGINEERING**

**Full Marks – 70**

**Time : 3 Hours**

*Answer Question No. 1 which is compulsory  
and any **five** from the rest.*

*The figures in the right-hand margin  
indicate marks.*



1. Answer the following questions :  $2 \times 10$
- (a) With reference to “Main Boilers”, state two ways of controlling superheat temperature of steam.
- (b) In the design of boiler burners, explain the significance of “Turn Down Ratio” and does it vary in “Pressure Jet Burner” ?

- (c) State two different methods of blade root fixing to the rotor disc of a high power steam turbine.
- (d) What is the use of “Soot Blowers” in a boiler ? Where does it get the supply of steam from ?
- (e) What is the cross sectional difference (Contour) between the impulse and reaction turbine bladings and why ?
- (f) With respect to safety valve of a boiler state the use of “Easing Gear” and “Compression Ring”.
- (g) With respect to the welded seam joints in a boiler, name the non-destructive tests to which these joints are tested.
- (h) In a smoke tube boilers, what is the difference between “Ordinary smoke tube” and “Stay Tube” ?
- (i) Prior to starting a steam turbine from cold, why “warming through” is required and how long does it take for a high power marine steam turbine ?

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**Contd.**

- (j) In a marine steam turbine plant, why speed reduction Gearings are fitted ?
2. Explain with sketches how a high pressure turbine designed for a reheat cycle differs from the non-reheat design. State the advantages of "Reheat Turbine". 8+2
3. (a) Describe with a simple diagrammatic sketch, an air register suitable for the supply of combustion air to the furnace. 7
- (b) State the difference between "Primary Flame" and "Secondary Flame". 3
4. Draw a line diagram of a main lubricating oil system for a Marine Steam Turbine, labelling all the principal components and showing the direction of flow in all lines. Give reason why a "Gravity Tank" is fitted in such systems. 8+2
5. (a) List all the "Mountings" fitted to a water tube boiler. 5

- (b) Explain how would you test a water level gauge of tubular type fitted to a "Hollow Column" attached to a boiler. 5
6. Draw a line diagram of a complete gland steam system associated with a Marine Steam Turbine, labelling the principal components. Also, make a neat sketch of "Turbine Shaft Labyrinth Gland with Carbon packing" and label the components. 6+4
7. Describe with a suitable sketch a "Composite Boiler" suitable for producing low pressure steam for auxiliary purpose. How does it differ from "Alternate fired" boiler ? 8+2
8. Sketch the "Fuel Oil System" for a boiler, starting from the fuel oil storage tank to the burners, incorporating and labelling all components together with safety fittings at all places. 10