

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-V • EXAMINATION – WINTER 2013

Subject Code: 151904**Date: 02-12-2013****Subject Name: Power Plant Engineering****Time: 10.30 am - 01.00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Draw general layout of modern steam power plant, label major components and state functions of each component. **07**
(b) Explain with neat sketch, construction and working of La Mont Boiler. **07**
- Q.2** (a) Write a brief note on present status of power generation in India. **07**
(b) Explain with neat sketch construction and working of Benson Boiler. **07**
- OR**
- (b) What are the advantages and disadvantages of Pulverized coal firing **07**
- Q.3** (a) What are the reasons of corrosion in a boiler and how it is control? **07**
(b) Write a short note on Electrostatic Precipitator. **07**
- OR**
- Q.3** (a) Derive an expression for chimney height in order to obtain a draught of 'h' mm of water column if the boiler used 'm' kg of air / kg of fuel. Assume, surrounding air temperature as 'T_a' and flue gas temperature as 'T_g' in degree absolute. Also derive an expression for the condition of maximum discharge of flue gases through a chimney. **07**
(b) Find the minimum height of the chimney required to produce a draught of 16 mm of H₂O, if 19 kg of air is required / kg of fuel burnt on the grate. The mean temperature of flue gases inside the chimney is 330°C and the atmospheric temperature is 30°C. **07**
- Q.4** (a) Classify the steam condensers and describe the methods of obtaining maximum vacuum in condenser. **07**
(b) Differentiate between Jet and Surface condensers. **07**
- OR**
- Q.4** (a) List different impurities found in feed water and their effects on performance of thermal power plant. **07**
(b) Explain with neat sketch, arrangement of a Diesel power plant; explain in brief function of each system. **07**
- Q.5** (a) Define the following terms: **07**
(i) Connected load, (ii) Maximum demand, (iii) Average demand, (iv) Load factor, (v) Diversity factor, (vi) Utilization factor, (vii) Plant capacity factor.
(b) Compare the following: **07**
(i) Nuclear power plant and thermal power plant
(ii) Diesel power plant and thermal power plant
- OR**
- Q.5** (a) Write a brief note on: **07**
(i) Effect of different pollutants on human health by thermal power plants,
(ii) Water pollution by thermal power plants and its control.
(b) Write short notes on : **07**
(i) Fast breeder reactor (ii) Problems in disposal of nuclear waste.