

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-V • EXAMINATION – WINTER • 2014****Subject Code: 151904****Date: 01-12-2014****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. Use of steam table is permitted.

- Q.1** (a) Draw general layout of modern steam power plant label major components and state the function of each component. **07**  
(b) Explain with neat sketch construction and working of Lamont Boiler **07**
- Q.2** (a) Explain types of Super heater and state the various methods used for controlling the superheat temperature of steam. **07**  
(b) Write short note on : "Bowl mill for coal pulverization" **07**
- OR**
- (b) Explain the working of electrostatic precipitator with neat sketch **07**
- Q.3** (a) Explain the function of following in combustion of fuel. **07**  
1. Hot primary air 2. Secondary air 3. Tertiary air  
(b) Draught produced by chimney is 3 cm of water column. Temperature of flue gas is 310° C and ambient temperature is 35°C. The flue gases formed per kg of fuel burnt is 25 kg. Neglect the losses and take the diameter of chimney as 2.0 meter. Calculate **07**  
1. Height of chimney in meter  
2. Mass of flue gas flowing through the chimney in kg/min
- OR**
- Q.3** (a) Comparison between Mechanical draught cooling tower and Natural cooling tower. **07**  
(b) Steam enters the condenser at 37° C. The condenser vacuum is 70 cm of mercury when the barometer reads 75 cm of mercury. Determine **07**  
1. Vacuum efficiency  
2. Mass of air per kg of steam present in condenser
- Q.4** (a) Discuss the methods of meeting variable loads on power plant. **07**  
(b) The annual peak load on 40 MW power station is 35 MW. The power station supplies load having maximum demand of 14 MW, 10 MW, 8 MW and 6 MW. The annual load factor is 0.44. Calculate **07**  
1. Average load 2. Energy supplied per year  
3. Diversity factor 4. Demand factor
- OR**
- Q.4** (a) State advantages and disadvantages of nuclear power plant. **07**  
(b) Explain with neat sketch Boiling Water Reactor **07**
- Q.5** (a) Explain with neat sketch arrangement of diesel power plant explain in brief function of each system. **07**  
(b) What are the different methods of cooling diesel engine? Compare different methods. **07**

**OR**

- Q.5** (a) Explain the effects of impurities in boiler feed water  
(b) With neat sketch discuss : “Hot lime soda process”

**07**

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