

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-V EXAMINATION – WINTER 2015

Subject Code: 151904**Date:05/12/2015****Subject Name: Power Plant Engineering****Time: 10:30am to 1:00pm****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) What factors should be taken into consideration while selecting the site for steam power plant? **07**
- (b) What is the function of super-heaters? Sketch and explain different super heaters briefly. **07**
- Q.2** (a) Draw line diagram of Velox boiler. Indicate all part of it. How it different from the other type of high pressure boiler? **07**
- (b) Explain any two from the following boiler accessories with neat sketch. **07**
(i) Air-preheater (ii) Economizer (iii) Re-heaters.
- OR**
- (b) Describe a neat line diagram of in-plant coal handling system and explain the equipment used at different stage. **07**
- Q.3** (a) Classify pulverized mill used in modern power plant. Explain any one with neat sketch. **07**
- (b) Write short note on Electrostatic precipitator. **07**
- OR**
- Q.3** (a) Determine the height and diameter of the chimney used to produce a draught for a boiler which has an average coal consumption of 1800 kg/hr and flue gases formed per kg of coal fired are 14 kg. The pressure losses through the system are given below. **07**
Pressure loss in fuel bed = 7 mm of water, pressure loss in boiler flues = 7 mm of water, pressure loss in bends = 3 mm of water, pressure loss in chimney = 3 mm of water. Pressure head equivalent to velocity of flue gases passing through the chimney = 1.3 mm of water. The temperature of ambient air and flue gases are 35°C and 310°C respectively. Assume actual draught is 80% of theoretical.
- (b) Classify the condensers. Explain any one surface type condensers with neat sketch. **07**
- Q.4** (a) Explain diesel engine various starting system briefly. **07**
- (b) Classify the diesel engine lubrication system. Explain any one with neat sketch. **07**
- OR**
- Q.4** (a) What do you mean by CANDU reactor? Explain working and construction of CANDU reactor with neat sketch. **07**
- (b) Describe Nuclear fuel briefly. Explain nuclear waste and its disposal methods. **07**
- Q.5** (a) Explain in detail Reverse Osmosis process for water treatment. **07**
- (b) Why cooling towers used in steam power plant? Compare forced draught cooling tower to induced draught cooling tower in detail. **07**
- OR**
- Q.5** (a) How steam power plant pollute air? What are the effects of this pollution on human health? **07**
- (b) The peak load on a 50 MW power station is 39 MW. It supplies power through **07**

four transformers whose connected loads are 17, 12, 9 and 10 MW. The maximum demands on these transformers are 15, 10, 8, and 9 MW respectively. if the annual load factor is 50% and plant is operating for 65% of the period in a year, find out the following:

- (i) Average load on the station
- (ii) Energy supplied per year
- (iii) Demand factor
- (iv) Diversity factor
- (v) Power Station use load.
