

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**PDDC - SEMESTER-IV • EXAMINATION – SUMMER 2013**

**Subject Code: X41903**

**Date: 10-06-2013**

**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.
- 4.

- Q.1** (a) Draw general layout of modern thermal power plant and label the major equipments. State the major circuits. **07**
- (b) Explain with neat sketch construction and working of Benson boiler. Also give merits and demerits of the same. **07**
- Q.2** (a) What are the advantages and disadvantages of pulverized coal firing? **07**
- (b) What do you understand by fluidized bed combustion? Explain working principle of same with neat sketch. **07**
- OR**
- (b) Explain the various methods used for controlling the superheat temperature of steam. **07**
- Q.3** (a) Explain pollution from thermal power plants and its control. **07**
- (b) Explain with neat sketch chain grate stoker. **07**
- OR**
- Q.3** (a) Explain with neat sketch Bowl mill for coal pulverization. **07**
- (b) Explain low-velocity and high velocity hydraulic ash handling system with neat sketches. **07**
- Q.4** (a) Discuss the merits and demerits of forced draught over natural draught. **07**
- (b) Draught produced by chimney is 1.8 cm of water column. Temperature of flue gas is 330°C and ambient temperature is 30°C. The flue gases formed per kg of fuel burnt is 23 kg. Neglect the losses and take the diameter of chimney as 1.8m. Calculate : (i) Height of chimney in m and (ii) Mass of flue gases flowing through the chimney in kg/min. **07**
- OR**
- Q.4** (a) Exhaust steam having a quality of 0.95 enter a surface condenser at an absolute pressure of 0.13 bar and comes out as a water at 43°C. The circulating water enters at 27°C and leaves at 37°C. Estimate quantity of circulating water and condenser efficiency. **07**
- (b) Explain natural draft cooling tower with neat sketch. **07**
- Q.5** (a) Explain sea water treatment using reverse osmosis process. **07**
- (b) Explain with neat sketch forced circulation thermo-stat engine cooling system **07**
- OR**
- Q.5** (a) Explain with neat sketch Boiling Water Reactor (BWR). **07**
- (b) Define the following terms: **07**
- (i) Peak load, (ii) Average load, (iii) Plant capacity factor,  
(iv) Connected load, (v) Diversity factor.

\*\*\*\*\*