

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER-IV • EXAMINATION – SUMMER • 2014

Subject Code: X41903

Date: 21-06-2014

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. Figures to the right indicate full marks.

- Q.1** (a) Explain the layout of modern thermal power plant with neat sketch. **07**
(b) Discuss the unique features of high pressure boiler. Why they are used in modern thermal power plant? **07**

- Q.2** (a) What is condenser? Classify the condenser and compare the jet type and surface type condenser. **07**
(b) The following data were obtained from the test of a surface condenser: Mean temperature of condensation = 35°C , Vacuum = 690 mm of Hg, Barometer reading = 750 mm of Hg, Hot well temperature = 28°C , Mass of condensate per hour = 1250 kg, Inlet temperature = 17°C , Outlet temperature = 30°C . State of the steam entering the condenser, $x = 0.9$. Find out the mass of the cooling water. **07**

OR

- (b) A boiler is equipped with a chimney of 30 meters height. The flue gases which pass through the chimney are at temperature of 288°C , whereas the atmospheric temperature is 21°C . If the air flow through the combustion chamber is 18 kg/kg of fuel burn. Find (1) theoretical draught produced in mm of water and (2) theoretical draught produced in height of hot gas column. **07**

- Q.3** (a) Write note on Schmidt-Hartmann boiler. **07**
(b) Discuss any two types of ash handling system. **07**

OR

- Q.3** (a) Write note on steps involved in coal handling system with neat sketch. **07**
(b) Discuss the merits and demerits of pulverized coal firing system. **07**

- Q.4** (a) Discuss the external water treatment. Explain with neat sketch Zeolite water treatment. **07**
(b) What is the function of cooling towers in thermal power plant? Classify them. Describe with neat sketch the working of Hyperbolic cooling tower. **07**

OR

- Q.4** (a) What do you mean by boiler draught? Why do we need draught in thermal power plant? Explain briefly the different types of draught system available in thermal power plant. **07**

- Q.4** (b) What are the sources of air leakage in condenser? How the air leakage does affect the performance of boiler? **07**

- Q.5** (a) Explain the nuclear power plant with neat sketch. **07**
(b) What are the advantages of diesel power plant over steam power plant? Where the diesel power plant is applied? **07**

OR

- Q.5** (a) Discuss pollutants from thermal power plant. **07**
(b) What is the load curve? What is the significance of load curve? What do you understand by load factor and diversity factor? **07**
