

Seat No.: _____

Enrolment No. _____

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

Subject Code: X 50901**Date: 04-12-2013****Subject Name: Electrical Power Utilization****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) Discuss the temperature control of resistance furnace. Which are the special purpose resistance ovens? **07**
 (b) What are the advantages of electrical power utilization? **07**
- Q.2** (a) Explain following terms : **07**
 1) Diversity factor 2) Load factor 3) Demand factor 4) Plant Utilization factor.
 (b) Explain two part tariff and power factor tariff. **07**
- OR**
- (b) What are the factors to be considerable for the choice of frequency for efficient operation of coreless furnace. **07**
- Q.3** (a) Explain design considerations of heating element. **07**
 (b) Explain principle of spot welding and butt welding with diagram. **07**
- OR**
- Q.3** (a) Explain eddy current heating with diagram. **07**
 (b) Estimate the energy required to melt 500 kg of brass in a 1- ph. Ajax-Wyatt furnace. **07**
 Given that specific heat of brass = 393.6 J kg⁻¹ C⁰ -1.
 Latent heat of fusion of brass = 163 kJ/kg
 Melting point of brass = 9200 C
 Assume furnace efficiency = 70%
- Q.4** (a) Explain polar curve. Draw the polar curve for different type of light fixture. **07**
 (b) Explain the working of Sodium vapour lamp with circuit diagram. **07**
- OR**
- Q.4** (a) What is the method of power factor improvement for furnaces? Discuss with circuit diagram. **07**
 (b) If the melt is to be carried out in ¾ hour in above furnace in (A), what must be the average power to the furnace? **07**
- Q.5** (a) Write down a note on “Extraction and refining of metals” by electrolysis. **07**
 (b) Discuss the temperature control of resistance furnace. Which are the special purpose resistance ovens? **07**
- OR**
- Q.5** (a) What is electro deposition? Which are the factors governing it? **07**
 (b) Explain economic choice of equipment with suitable example. **07**
