

GUJARAT TECHNOLOGICAL UNIVERSITY**PDDC SEM-V Examination-Nov-2011****Subject code: X50901****Date: 19/11/2011****Subject Name: Electrical Power Utilization****Time: 2.30 pm -5.00 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) What are the advantages of electrical power utilization? **07**
(b) Give the names of electrical furnaces you know. Write down Stefan law of Heat dissipation (H) for resistance. **07**

- Q.2** (a) Design the heating element of Resistance furnace. **07**
(b) Discuss the temperature control of resistance furnace. Which are the special purpose resistance ovens? **07**

OR

- (b) Write down technical note on salt bath heating. **07**

- Q.3** (a) Estimate the energy required to melt 500 kg of brass in a 1-ph. $A_{j\alpha x}$ - W_{yatt} furnace. **07**
Given that specific heat of brass = $393.6 \text{ J kg}^{-1} \text{ C}^{-1}$.
Latent heat of fusion of brass = 163 kJ/kg
Melting point of brass = 920° C
Assume furnace efficiency = 70%
(b) If the melt is to be carried out in $\frac{3}{4}$ hour in above furnace in (A), what must be the average power to the furnace? **07**

OR

- Q.3** (a) Discuss coreless induction furnace. **07**
(b) What are the factors to be considerable for the choice of frequency for efficient operation of coreless furnace. **07**

- Q.4** (a) What is the method of power factor improvement for furnaces? Discuss with circuit diagram. **07**
(b) What are the different methods of welding? Discuss arc welding. **07**

OR

- Q.4** (a) Write technical note on sodium lamp. **07**
(b) Explain the laws of illumination. **07**

- Q.5** (a) What are the different methods of welding? Discuss arc welding **07**
(b) Write technical note on "two part tariff." **07**

OR

- Q.5** (a) Write down a note on "Extraction and refining of metals" by electrolysis. **07**
(b) What is electro deposition? Which are the factors governing it? **07**
