

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

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

## 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.  $A_{jax}$ - $W_{yatt}$  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 =  $920^{\circ} \text{ C}$   
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**

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