Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–V • EXAMINATION – WINTER • 2014

Subject Code: X50901 **Date: 29-11-2014**

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)**	Write down technical note on salt bath heating	**07**
	(b)	What are the various applications of electrolysis? Explain extraction of metals.	**07**
Q.2	**(a)**	Write technical note on sodium lamp.	**07**
	(b)	What are the factors to be considerable for the choice of frequency for efficient operation of coreless furnace.	**07**
		OR	
	(b)	Discuss the temperature control of resistance furnace. Which are the special purpose resistance ovens?	**07**
Q.3	**(a)**	State and Explain the laws of Illumination.	**07**
	(b)	Explain Eddy Current Heating with neat diagram also mention the advantages and application of it.	**07**
		OR	
Q.3	**(a)**	Explain general principles that are generally employed in designing the street lighting?	**07**
	(b)	Explain the working of a fluorescent tube with the help of circuit diagram. State the units of power, Energy, Lux, Luminous Intensity.	**07**
Q.4	**(a)**	Define following terms: 1) Diversity factor 2) Load factor 3) Demand factor 4) Plant Utilization factor.	**07**
	(b)	Determine the power capacity and efficiency of a 3 phase arc furnace for melting steel taking a current of 7 KAmp, capacity being 2 tonnes of steel per 25 minutes. Specific heat of steel = 0.12 Latent heat of steel = 8.89 Kcal/kg Melting point of steel = 1370°C Initial temperature = 20°C Arc voltage = 60 V Voltage across the furnace = 80 V	**07**
Q.4	**(a)**	A 3 phase, 1380 kW arc furnace is fed through a step down transformer having an equivalent secondary resistance of 0.003 ohms and reactance of 0.0027 ohms per phase respectively. The arc drop is 80 V. Determine the output voltage of the transformer for a current of 6 KAmp. Also determine the power factor of the load and the efficiency of the furnace.	**07**
	(b)	Explain Reflection and Refraction.	**07**

Q.5	**(a)**	State the types of welding and briefly describe any two.	**07**
	(b)	What is the principle of electro deposition? State and explain the factors on which the quality of electro deposition depends.	**07**

Q.5	**(a)**	Explain use of off peak loads	**07**
	(b)	Explain economic choice of equipment with suitable example.	**07**

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