Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– VI EXAMINATION – SUMMER 2020

Subject Code: 2160907 **Date:28/10/2020**

Subject Name: UTILIZATION OF ELECTRICAL ENERGY AND TRACTION

Time: 10:30 AM TO 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.**

			MARKS
Q.1	**(a)**	Suggest suitable drives for following applications 1) Lathe 2) Paper mill 3) Electric traction.	**03**
	(b)	Define 1) Luminous efficiency 2) Chemical equivalent 3) Refrigerant	**04**
	(c)	Draw speed time characteristic of main line traction system. Also explain each part in detail.	**07**
Q.2	**(a)**	Classify different track electrifications.	**03**
	(b)	Explain faraday's law of electrolysis.	**04**
	(c)	Discuss the various factors that are to be considered in selection of electric drive for particular application.	**07**
		OR	
	(c)	A 15 KW, 220 V, single phase resistance oven employs nickel-chrome wire for its heating elements. If the wire temperature is not to be exceed 1000^0 c and the temperature of the charge is to be 600^0c. Calculate the diameter and length of the wire. Assume radiating efficiency to be 0.6 and emissivity as 0.9, for nickel chrome resistivity is 1.016×10^{-6} Ωm.	**07**
Q.3	**(a)**	State level of illumination as per Indian standard for following applications 1) Offices 2) Street lighting 3) Hospitals.	**03**
	(b)	Explain function of flywheel with calculations when load is increasing.	**04**
	(c)	Explain direct and Indirect resistance heating.	**07**
		OR	
Q.3	**(a)**	Define the following terms with respect to illumination. 1) Co-efficient of utilization. 2) Depreciation factor 3) Space height ratio	**03**
	(b)	Discuss properties of resistance heating elements.	**04**
	(c)	Construction and working of Arc furnace.	**07**
Q.4	**(a)**	State advantages of electric welding.	**03**
	(b)	Explain dielectric heating.	**04**
	(c)	Explain construction and working of direct arc furnace and indirect arc furnace.	**07**
		OR	
Q.4	**(a)**	State requirements of good weld.	**03**
	(b)	Explain 1) Electro deposition 2) Electro platting	**04**
	(c)	Compare Arc welding and resistance welding	**07**

Q.5	**(a)**	List out applications of dielectric heating.	**03**
	(b)	Compare AC and DC welding	**04**
	(c)	Draw a diagram of electric locomotive and explain function of each part I it.	**07**

OR

Q.5	**(a)**	Explain with neat diagram the pantograph collector.	**03**
	(b)	Compare AC and DC traction system.	**04**
	(c)	Draw electrical circuit of a domestic refrigerator. Also explain working of each component in it.	**07**

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