Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – WINTER 2018

Subject Code:2160907 Date:15/12/2018

Subject Name:Utilization of Electrical Energy and Traction

Time: 02:30 PM TO 05:00 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)**	Attempt all:	**03**
	1	Justify : DC shunt motor should never be started on load.	
	2	Draw labelled typical speed-time curve for main line service.	
	3	Write principle of dielectric heating.	
	(b)	Attempt all :	**04**
	1	List main causes of failure of heating elements.	
	2	State and explain in brief Lambert's cosine law.	
Q.2	**(a)**	Write classification of electrical drive in detail.	**03**
	(b)	Write detail specifications of squirrel cage induction motor.	**04**
	(c)	Explain different braking methods used for DC series motor.	**07**
		OR	
	(c)	State various types of current collectors in common use for overhead contact system. Describe with a neat diagram the pantograph collector.	**07**
Q.3	**(a)**	Explain applications of high frequency eddy current heating.	**03**
	(b)	Suggest suitable A.C. & D.C. drives for following applications. Give reasons for the same. (i) Pump (ii) Hoist (Crane)	**04**
	(c)	Explain working of LPMV lamp with necessary diagram.	**07**
		OR	
Q.3	**(a)**	Explain concept of microwave heating.	**03**
	(b)	List different methods of electrical heating. Explain resistance heating.	**04**
	(c)	Draw and explain electrical circuit used in domestic refrigerator.	**07**
Q.4	**(a)**	State Faraday's Laws of electrolysis.	**03**
	(b)	Compare Resistance and Arc welding.	**04**
	(c)	EMU has an average speed of 42 kmph on level track between stops 1400m apart. It is accelerated at 1.7 kmphps & braked at 3.3 kmphps. Draw speed-time curve for run indicating all numerical values.	**07**
		OR	
Q.4	**(a)**	Explain principle of air conditioning.	**03**
	(b)	What is electro plating? Describe it in detail.	04
	(c)	Explain Ajax Wyatt type induction furnace with diagram.	**07**
Q.5	**(a)**	Define: (i) Candle power (ii) Luminous intensity (iii) Utilization factor	**03**
	(b)	State and explain laws of illumination.	**04**
	(c)	Deduce the expression for the total tractive effort for propulsion of train considering acceleration, up the gradient, to overcome resistance.	**07**
		OR	
Q.5	**(a)**	Discuss factors affecting scheduled speed.	**03**
	(b)	Write different steps for design lighting scheme considering various parameters.	**04**
	(c)	Write principle of resistance welding. Explain Butt welding.	**07**

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