Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI(NEW) – EXAMINATION – SUMMER 2019

Subject Code:2160907 Date:29/05/2019

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)**	What are the various methods of electric welding?	**03**
	(b)	Compare DC welding and AC welding	**04**
	(c)	What is rheostatic barking and what precautions are taken when rheostatic braking is applied to d.c series traction motor?	**07**
Q.2	**(a)**	List four advantages of ac series motor used as traction motor	**03**
	(b)	Explain the various factors to be taken into account for designing schemes of Flood lighting	**04**
	(c)	A high-frequency induction furnace that takes 20 min to melt 1.9 kg of aluminum, the input to the furnace being 3 kW, and the initial temperature is 25°C. Then, determine the efficiency of the furnace The specific heat of aluminum = 0.212. Melting point = 660°C. The latent heat of the fusion of aluminum = 76.8 kcal/kg.	**07**
		OR	
	(c)	The distance between two stops is 5 km. A train has schedule speed of 50 kmph. The train accelerates at 2.5 kmphps and retards 3.5 kmphps and the duration of stop is 55 s. Determine the crest speed over the run assuming trapezoidal speed–time curve	**07**
Q.3	**(a)**	State the inverse square law and cosine law.	**03**
	(b)	Derive an expression for the temperature rise of an equipment in terms of the heating time constant	**04**
	(c)	Which system you consider to be the best for the suburban railways in the vicinity of large cities? Give reasons for your answer.	**07**
		OR	
Q.3	**(a)**	Describe the term MSCP and lamp efficiency	**03**
	(b)	Explain the factors affecting electro deposition	**04**
	(c)	Describe the construction and principle of working of an induction furnace.	**07**
Q.4	**(a)**	What are the advantages of coated electrodes in welding process?	**03**
	(b)	Draw and explain the electrical circuit used in refrigerator.	**04**
	(c)	With the help of a complete Speed-Time curve, discuss how deferent parameters of this curve change with the type of train service.	**07**
		OR	
Q.4	**(a)**	Why tungsten is selected as filament material	**03**
	(b)	Draw the connection diagram of automatically starting A squirrel cage induction motor by means of an auto-transformer.	**04**

	(c)	With the help of diagram explain the working of resistance oven, also draw the thermostat control circuit for maintaining temperature of oven.	**07**

Q.5	**(a)**	A motor operates continuously on the following load cycle. 20 kW for 10 sec, 10 kW for 15 sec, 30 kW for 5 sec, 50 kW for 20 sec, 40 kW for 10 sec, and idle for 5 sec. find the size of the motor required.	**03**
	(b)	Describe the various types of electric Arc welding processes.	**04**
	(c)	Discuss in detail the various light fittings used for indoor lighting giving special applications of each of them.	**07**

OR

Q.5	**(a)**	List out the applications of galvanizing process .	**03**
	(b)	State and explain faradays laws of electrolysis.	**04**
	(c)	Explain the calculation of electrical loads for air conditioning	**07**

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