

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: 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.	03
	(b) Attempt all : 1 List main causes of failure of heating elements. 2 State and explain in brief Lambert's cosine law.	04
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 kmphs & braked at 3.3 kmphs. 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
