

**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
<b>Q.1</b>	(a) Attempt all:	<b>03</b>
	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 :	<b>04</b>
	1 List main causes of failure of heating elements.	
	2 State and explain in brief Lambert's cosine law.	
<b>Q.2</b>	(a) Write classification of electrical drive in detail.	<b>03</b>
	(b) Write detail specifications of squirrel cage induction motor.	<b>04</b>
	(c) Explain different braking methods used for DC series motor.	<b>07</b>
	<b>OR</b>	
	(c) State various types of current collectors in common use for overhead contact system. Describe with a neat diagram the pantograph collector.	<b>07</b>
<b>Q.3</b>	(a) Explain applications of high frequency eddy current heating.	<b>03</b>
	(b) Suggest suitable A.C. & D.C. drives for following applications. Give reasons for the same. (i) Pump (ii) Hoist (Crane)	<b>04</b>
	(c) Explain working of LPMV lamp with necessary diagram.	<b>07</b>
	<b>OR</b>	
<b>Q.3</b>	(a) Explain concept of microwave heating.	<b>03</b>
	(b) List different methods of electrical heating. Explain resistance heating.	<b>04</b>
	(c) Draw and explain electrical circuit used in domestic refrigerator.	<b>07</b>
<b>Q.4</b>	(a) State Faraday's Laws of electrolysis.	<b>03</b>
	(b) Compare Resistance and Arc welding.	<b>04</b>
	(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.	<b>07</b>
	<b>OR</b>	
<b>Q.4</b>	(a) Explain principle of air conditioning.	<b>03</b>
	(b) What is electro plating? Describe it in detail.	<b>04</b>
	(c) Explain Ajax Wyatt type induction furnace with diagram.	<b>07</b>
<b>Q.5</b>	(a) Define: (i) Candle power (ii) Luminous intensity (iii) Utilization factor	<b>03</b>
	(b) State and explain laws of illumination.	<b>04</b>
	(c) Deduce the expression for the total tractive effort for propulsion of train considering acceleration, up the gradient, to overcome resistance.	<b>07</b>
	<b>OR</b>	
<b>Q.5</b>	(a) Discuss factors affecting scheduled speed.	<b>03</b>
	(b) Write different steps for design lighting scheme considering various parameters.	<b>04</b>
	(c) Write principle of resistance welding. Explain Butt welding.	<b>07</b>

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