

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– VI (New) EXAMINATION – WINTER 2019

Subject Code: 2160907
Date: 16/12/2019
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) Classify electrical drive? Explain any one with its applications.	03
	(b) What do you understand by Tractive efforts? Derive the expression for the same.	04
	(c) Enlist different types of electric braking. Explain Regenerative braking of D.C Shunt motor along with its application.	07
Q.2	(a) Write properties of resistance heating elements.	03
	(b) Explain factors affecting selection of drive.	04
	(c) A train has schedule speed of 30 kmph over a level track, distance between stations being 1 km. Station Stopping time is 20 seconds. Assuming braking retardation of 3 kmphs and maximum speed 25 percent greater than average speed, calculate acceleration required to run the service if the speed-time curve is approximated by a trapezoidal curve.	07
OR		
Q.3	(c) Explain operation of an electrical drive in all the four quadrants.	07
	(a) Explain following term (1) co-efficient of adhesion (2) schedule speed (3) specific energy consumption.	03
	(b) Classify electric Heating. Write advantages of electric Heating.	04
	(c) Explain the design procedure of heating element.	07
OR		
Q.3	(a) Compare AC and DC arc welding.	03
	(b) State and explain laws of illumination.	04
	(c) Explain the trapezoidal speed – time curve with necessary equations.	07
Q.4	(a) Define the following terms with its range w.r.to illumination. (a) Utilization Factor, (b) Waste light factor, (c) glare	03
	(b) State and explain Faraday's laws of electrolysis.	04
	(c) Explain Ajax-Wyatt Furnace with advantages, disadvantages and applications.	07
OR		
Q.4	(a) Compare AC and DC Traction system.	03
	(b) A slab of insulating material 150 cm ² in area and 1 cm thick is to be heated by dielectric Heating. The Power required is 400 W at 30 MHz Material has a relative permittivity of 5 and Power factor of 0.05. Absolute permittivity = 8.854×10^{-12} F/m. determine necessary voltage.	04
	(c) Explain electro-deposition processes. Discuss various factors governing the electro deposition processes.	07

- Q.5 (a) Write Desirable properties of an ideal Refrigerant. **03**
(b) Discuss butt and flash butt welding with diagram. **04**
(c) What is electroplating. Explain process of electro plating. **07**
- OR**
- Q.5 (a) Write principle of air-conditioning and enlist advantages of it. **03**
(b) What is flood lighting? Where it is used? **04**
(c) Explain sodium vapour lamp with neat sketch. **07**

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