Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V EXAMINATION – WINTER 2015

Subject Code: 150906 **Date:14/12/2015**

Subject Name: Electrical Power Utilization and Traction

Time: 10:30am to 1:00pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Explain design procedure of heating element with necessary expression.	**07**
	(b)	A 30 kw, 400 volts resistance oven is to employ nickel chrome strip 0.254mm thick for 3star connected heating elements. If wire temp. is 1100˚C and that up charge is 700˚ estimate suitable width for strip. Assume emissivity (ε) = 0.9 and radiating efficiency (η) =0.5	**07**
Q.2	**(a)**	Explain speed control of 3phase induction motor in brief.	**07**
	(b)	Explain regenerative breaking used in traction system.	**07**
		OR	
	(b)	Using the simplified trapezoidal speed time curve derive an expression for the maximum speed in terms of acceleration, retardation, distance between stops and actual time of run between stops.	**07**
Q.3	**(a)**	Explain principle and working of an indirect core type furnace.	**07**
	(b)	Explain eddy current heating and its application.	**07**
		OR	
Q.3	**(a)**	State and explain laws of illumination	**04**
	(b)	Explain street lighting.	**05**
	(c)	Explain principle of operation of a sodium vapor lamp giving its neat sketch.	**05**
Q.4	**(a)**	Explain different types of resistance welding.	**07**
	(b)	Explain in brief breaking of traction motors.	**07**
		OR	
Q.4	**(a)**	State and explain faraday's laws of electrolysis.	**04**
	(b)	Explain process of electroplating.	**05**
	(c)	Explain rotor resistance starter method for wound rotor 3phase induction motors.	**05**
Q.5	**(a)**	Explain clearly speed time curves for different services.	**07**
	(b)	Explain flux control method for speed control of d.c. shunt motor.	**07**
		OR	
Q.5	**(a)**	Suggests suitable A.C. and D.C. drives for following applications. Give reasons for same (i) Lifts (ii) Lathe (iii) Blower (iv) Rolling mills.	**07**
	(b)	Classify electric drives and state the factors affecting selection of drive.	**07**

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