Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER V • EXAMINATION – WINTER - 2012

Subject code: 150904 **Date: 16-01-2013**

Subject Name: Element of Electrical Design

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.**

Q.1	**(a)**	What are apparent flux density and discuss how to calculate for slotted armature.	**07**
	(b)	Explain four fundamental equations used in design of electromagnet.	**07**
Q.2	**(a)**	Derive the steps for calculate the starter resistance for D.C shunt motor.	**07**
	(b)	Discuss design procedure of small single phase transformer.	**07**
		OR	
	(b)	Find the section resistance of 7 stud field regulator for generator to give limit of 500 and 560 voltages in equal steps. the magnetizing curve is given in fig. The field is 934 ohm.	**07**
Q.3	**(a)**	Give the name of various type of wiring used for domestic installation.	**07**
	(b)	Determine the air gap length of a D.C. machine for following data. gross core length=0.1 m,no of ducts=01,width of duct=10mm,slot pitch=24mm,slot width=12mm,caters coefficient for slot and ducts=0.3,gap flux density at pole center=0.65T,field MMF per pole=3800A,mmf required for iron part of magnetic circuit=600A	**07**
		OR	
Q.3	**(a)**	Discuss design procedure for welding transformer.	**07**
	(b)	Write all steps to estimate the total cost of electric wiring installation for building	**07**
Q.4	**(a)**	What is armature winding? Define following term with respect to it (1) Turn (2) Coil (3)Coil side (4) Single layer winding	**07**
	(b)	Draw the winding diagram in developed from for simplex lap wound 24 slot, 4 pole, and DC armature with 24 commutated segments.	**07**
		OR	
Q.4	**(a)**	Write short answer (1) difference between lap and wave winding (2) dummy coil in context of dc winding (3) equalizer connection in context of dc winding.	**07**
Q.4	**(b)**	Draw winding diagram for 4 pole,24 slot,3 phase mush connected armature(show only 1 phase)	**07**
Q.5	**(a)**	Draw main circuit and control circuit of star delta starter for sq cage induction motor.	**07**
	(b)	State various methods for calculating MMF required for tooth in dc machine. Explain one of them.	**07**
		OR	
Q.5	**(a)**	Explain the load assessment and permissible voltage drop for electrical installation.	**07**
	(b)	Classify various electromagnets give their application briefly; explain construction of flat faced armature type electromagnet.	**07**

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