Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–V EXAMINATION – WINTER 2015

Subject Code:X50902 **Date:12/12/2015**

Subject Name: Elements of Electrical Design

Time: 10:30pm to 01:00pm **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 how iron losses are estimated per unit weight of the machine.	**07**
	(b)	Prepare winding layout for a three phase a.c. machine having 36 armature slots, 4 pole hemitropic winding.	**07**
Q.2	**(a)**	Draw and explain power and control circuit of a DOL starter.	**07**
	(b)	Prove that section resistances are in geometrical progression for a d.c.shunt motor starter.	**07**
		OR	
	(b)	Find resistance of each of the 5 sections of a starter for a 440 V , DC series motor used for cranes. Motor resistance is 0.32 ohm, max permissible starting current is 110 amp. Assume magnetization curve to be a straight line passing through origin.	**07**
Q.3	**(a)**	Explain the design procedure of horse shoe type small circular magnet.	**07**
	(b)	Determine required MMF for air gap of a machine having core length =0.32m,including 4 ducts of 10 mm each, pole arc=0.19m, slot pitch =65.4 mm slot opening = 5 mm , air gap length 5 mm , flux per pole = 52 mwb, carter's coeff. Is 0.18 for opening/gap =1 and it is 0.28 for opening/gap =2.	**07**
		OR	
Q.3	**(a)**	Briefly explain procedure to find MMF required for tapered teeth.	**07**
	(b)	Define and explain following terms clearly: (1) Stacking factor. (2) Gap contraction factor (3) Space factor.	**07**
Q.4	**(a)**	Explain the design procedure of a three phase variable choke coil.	**07**
	(b)	Explain necessity of equalizer connection in an armature winding.	**07**
		OR	
Q.4	**(a)**	Explain how design procedure of a welding transformer is different from that of normal transformer.	**07**
	(b)	Write technical note on real and apparent flux densities.	**07**
Q.5	**(a)**	What are types of electric wiring? Explain any two in detail.	**07**
	(b)	Explain "Factory lighting".	**07**
		OR	
Q.5	**(a)**	Compare different types of domestic wiring system.	**07**
	(b)	Explain how a flood lighting scheme for a historic monument can be designed?	**07**

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