Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–V • EXAMINATION – SUMMER 2013

Subject Code: X20903 **Date: 13-06-2013**

Subject Name: Electrical Machines I and II

Time: 02.30 pm - 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 is the principle of operation of D.C.generator? state the three conditions under which the self excited generator would fail to develop the rated terminal voltage?	**07**
	(b)	Describe the different parts of D.C. machine; their material and functions with the help of a neat diagram.	**07**
Q.2	**(a)**	Explain O.C. and S.C. tests for finding out efficiency and voltage regulation of single phase transformer.	**07**
	(b)	A 3300 V/ 200 V , 50 Hz, 100 KVA, transformer has its low voltage winding with 80 turns Calculate: 1. The current in both the windings. 2. Number of turns of high voltage winding 3. Maximum value of flux.	**07**
		OR	
	(b)	A 25 KVA, 4000V/ 200 V, 50 Hz, transformer has R1= 3.45Ω, R2=0.009Ω, X1=5.2Ω, and X2= 0.051Ω. Calculate equivalent resistance and equivalent reactance referred to 1) primary 2) secondary Also calculate net power lost due to winding resistance.	**07**
Q.3	**(a)**	Compare field control and armature voltage control methods of speed control of D.C. motor.	**07**
	(b)	Write a note on 3 point starter for D.C. motor	**07**
		OR	
Q.3	**(a)**	Explain Ward Leonard method to control the speed of D.C. motor	**07**
	(b)	Explain in brief different types of losses occur in D.C. machine.	**07**
Q.4	**(a)**	What is slip? Explain different methods for measurement of slip in induction motor	**07**
	(b)	Explain torque slip characteristics of induction motor with diagram.	**07**
		OR	
Q.4	**(a)**	Explain working principle of induction motor. Also compare squirrel cage and slip ring induction motor.	**07**
Q.4	**(b)**	Explain effect of change in frequency and voltage on torque of induction motor.	**07**
Q.5	**(a)**	Define voltage regulation of a synchronous machine. Explain MMF method to find out voltage regulation.	**07**
	(b)	Compare 3 phase synchronous motor with 3 phase induction motor.	**07**
		OR	
Q.5	**(a)**	Why synchronous motor is not self starting? Describe two methods used to start this motor.	**07**
	(b)	Explain with phasor diagram, effect of change in excitation at constant load in synchronous motor.	**07**

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