Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. Sem-III Remedial Examination May 2011

Subject code: 131701 **Subject Name: Electrical Machines**

Date: 28-05-2011 **Time: 10.30 am – 01.00 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)**	Explain auto transformer and star-delta starter methods for starting of an Induction Motor.	**07**
	(b)	Describe an auto transformer including its points such as definition, comparision with two winding transformer, saving of copper and its applications.	**07**
Q.2	**(a)**	Explain steps for the construction of the circle diagram of an Induction Motor.	**07**
	(b)	Describe about crawling and cogging of an Induction Motor.	**07**
		OR	
	(b)	A 10 H.P.(7.46kw) motor when started at normal voltage with a star-delta switch in the star position is found to take an initial current of 1.7x full load current and gave an initial starting torque of 35% of full load torque. Explain what happens when the motor is started under the following conditions (a) an auto transformer giving 60% if the normal and calculate in each case the value of starting current and torque in terms of the corresponding quantities at full load.	**07**
Q.3	**(a)**	Explain Scott-connection used for the 3-phase to 3-phase transformation in 3-phase transformer.	**07**
	(b)	A single phase 150KVA transformer has efficiency 96% at full load on 0.8 power factor and on half load at 0.8 power factor lagging. Find the following (1) Iron loss (2) copper loss at full load (3) The load KVA at which maximum efficiency occurs (4) The maximum efficiency of the transformer at 0.8 power factor lagging.	**07**
		OR	
Q.3	**(a)**	Give Comparison between Synchronous and Induction Motors.	**07**
	(b)	What is voltage regulation? How it can be determined by using Zero power factor method in Synchronous machine?	**07**
Q.4	**(a)**	What is commutation? State methods of improving commutation and describe any one in detail.	**07**
	(b)	Explain External and Internal characteristics of D.C. shunt generator in brief.	**07**
		OR	
Q.4	**(a)**	Explain different methods for speed control of Series Motors.	**07**
	(b)	The torque of the load driven by a 400V shunt motor varies as the cube of the speed. The current taken by the motor is 40A at a certain speed. Calculate the additional resistance required to be connected in series with the armature circuit to reduce the speed to 60% of the original speed. The resistance is 0.35 ohm.	**07**

Q.5	**(a)**	Explain the two tests used for determing the losses in single phase transformer.	**07**
	(b)	Explain about elementary concepts of Rotating Machines.	**07**

OR

Q.5	**(a)**	How the Rotating field is produced in an Induction Motor?	**07**
	(b)	Which conditions must be satisfied for parallel operation of Alternators? Explain Synchronizing of single phase Alternators.	**07**

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