Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. Sem-III Remedial Examination March 2010

Subject code: 130904 **Subject Name: Electrical Machine-1**

Date: 11 /03/2010 **Time: 11.00 am – 01.30pm**

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 the basic principle of d.c.motor. Derive its torque equation.	**07**
	(b)	Explain Torque vs. Armature current and Speed vs. Armature current characteristics of D.C. series motor.	**07**
Q.2	**(a)**	Derive the e.m.f equation for D.C generator for lap winding and wave winding.	**07**
	(b)	Explain different losses occurs in D.C generator with diagram	**07**
		OR	
	(b)	A 4-pole, lap wound D.C shunt generator has a useful flux per pole of 0.07 wb. The armature winding consists of 220 turns each of 0.004 ohm resistance. Calculate the terminal voltage when running at 900 r.p.m if the armature current is 50 amp.	**07**
Q.3	**(a)**	Explain how does the rotor of induction motor rotate? Explain slip of induction motor. Explain frequency of rotor current.	**07**
	(b)	Derive the equation of torque under running condition for three phase induction motor. Also derive the condition for maximum torque under running condition.	**07**
		OR	
Q.3	**(a)**	Explain Torque-Slip characteristics of three phase induction motor. Also explain effect of supply voltage and frequency on torque.	**07**
	(b)	Explain the different methods for measuring slip of an induction motor.	**07**
Q.4	**(a)**	Derive the E.M.F. equation of single phase transformer and explain effect of turns ratio on output voltage.	**07**
	(b)	Explain the working of transformer under 'ON LOAD' condition with vector diagram for resistive and inductive load.	**07**
		OR	
Q.4	**(a)**	Explain the equivalent circuit of single phase transformer referred to primary side.	**07**
	(b)	Explain O.C and S.C test for single phase transformer.	**07**
Q.5	**(a)**	Explain the Sumpner Test on single phase transformer.	**07**
	(b)	Explain different losses occurs in the transformer and derive the condition for maximum efficiency	**07**
		OR	
Q.5	**(a)**	What is necessity of starter for dc motor? Explain three point starter.	**07**
	(b)	Explain the Distribution factor and Pitch factor regarding alternator. Explain effect of it on e.m.f.	**07**

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