Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. Sem-III Remedial Examination March 2010

Subject code: 131701 **Subject Name: ELECTRICAL MACHINES**

Date: 11 /03 /2010 **Time: 11.00 am – 01.30 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)**	A d.c. shunt generator delivers 450 Amp at 230V and the resistance of the shunt field and armature are 50Ω and 0.03Ω respectively. Calculate the generated emf.	**07**
	(b)	Explain following characteristic of separately excited d.c. generator. (i) No-load saturation characteristic (ii) Internal and External characteristic	**07**
Q.2	**(a)**	Explain armature reaction of the d.c. machine. Give its remedies also.	**07**
	(b)	Explain in brief various methods of speed control of d.c. shunt motors.	**07**
		OR	
	(b)	Explain working principle of d.c. motor. Derive the condition for maximum Power.	**07**
Q.3	**(a)**	Explain the conditions of parallel operation of three phase transformers.	**07**
	(b)	How three phase to two phase transformation of transformer is obtained?	**07**
		OR	
Q.3	**(a)**	In no load test of single phase transformer, the following test data were obtained: Primary voltage: 220V; Secondary voltage: 110V; Primary current: 0.5A; Power input: 30W. Find the following: (i) The turns ratio (ii) The magnetizing component of no-load current (iii) It's working (or loss) component (iv) The iron loss Resistance of primary winding = 0.6Ω.	**07**
	(b)	Write advantages and applications of auto transformer.	**07**
Q.4	**(a)**	Drive torque equation for three phase induction motor. Also derive condition for maximum torque and equation for maximum torque.	**07**
	(b)	Draw torque-speed characteristic of induction motor. Also explain change in it with change in rotor resistance and frequency.	**07**
		OR	
Q.4	**(a)**	Explain rotating magnetic field theory. Also explain how three phase induction motor starts.	**07**
	(b)	Explain speed control of three phase induction motor.	**07**
Q.5	**(a)**	Compare star-delta starter with auto transformer starter for tree phase induction motor.	**07**
	(b)	Explain why single phase induction motor is not self started? Explain the starting methods for single phase induction motor in brief.	**07**
		OR	
Q.5	**(a)**	What is commutation? Give remedies for commutation.	**07**
	(b)	Explain various types of losses occurring in a d.c.generator.	**07**

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