Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

P.D.D.C. Sem- II Remedial Examination Nov / Dec. 2010

Subject code: X21101 **Subject Name: Electrical Engineering**

Date: 29 / 11 / 2010 **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 the functions of various components of D. C. Generator.	**07**
	(b)	A 4- pole D.C. Shunt generator with a shunt generator with a shunt field resistance of 100 ohm and an armature resistance of 1 ohm has 378 wave connected conductors in its armature. The flux per pole is 0.2 wb. If a load resistance of 10 ohm is connected across the armature terminals and the generator is driven at 1000 r.p.m. Calculate the power absorbed by the load.	**07**
Q.2	**(a)**	Explain the internal and external characteristics of D.C. shunt and series generator.	**07**
	(b)	Explain different methods of speed control of D. C .series Motor.	**07**
		OR	
	(b)	A 220 V D.C. shunt motor having armature resistance of 0.25 ohm carries an armature current of 50 Amp runs at 600 r.p.m. If the flux is reduced by 10% by field regulator, find the speed assuming load torque remains the same.	**07**
Q.3	**(a)**	Draw and explain the vector diagrams when the single phase transformer is on ON- Load condition.	**07**
	(b)	Derive the equation of torque under starting condition for three phase Induction Motor.	**07**
		OR	
Q.3	**(a)**	Explain the principle of three phase Induction Motor. Also state the advantages and disadvantages of Three phase Induction motor. Explain the construction of Squirrel cage Induction motor.	**07**
	(b)	A 10 KVA, 2000/400 V single phase transformer has R1= 5 ohm.X1=12 ohm, R2= 0.2 ohm and X2= 0.48 ohm. Determine the equivalent impedance of the transformer referred to (1) primary side (2) secondary side	**07**
Q.4	**(a)**	What is Voltage regulation of Alternator. Explain the synchronous impedance method of determining regulation of an alternator.	**07**
	(b)	Explain the operation principle of synchronous motor. Also explain how to get continuous unidirectional torques.	**07**
		OR	
Q.4	**(a)**	Describe the construction of core and shell type single phase transformer. Derive the e.m.f equation of single phase transformer.	**07**
	(b)	States the types of single phase Induction motor. Explain capacitor start and capacitor run motor.	**07**
Q.5	**(a)**	Explain in brief construction and working principle of universal motor.	**07**
	(b)	Explain the difference between cylindrical and salient pole rotors used in large alternator . Define (1) pitch factor (2) Distribution factor (3) form factor.	**07**
		OR	
Q.5	**(a)**	Explain in brief construction and working principle of Scharge motor.	**07**
	(b)	Explain the operating principle of synchronous motor. Draw the vector diagrams when the synchronous motor runs at under excitation and over excitation.	**07**

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