Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC SEM-II Examination May 2012

Subject code: X21901

Subject Name: Electrical Machines and Electronics

Date: 23/05/2012 **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)**	State and explain different parts of D.C. machines.	**07**
	(b)	What are the different parts of transformer? Also explain the working principal of single phase transformer.	**07**
Q.2	**(a)**	Derive the expressions of armature torque and shaft torque of D.C. motor.	**07**
	(b)	Derive an emf equation of D.C machine.	**07**
		OR	
	(b)	Derive an emf equation of single phase transformer.	**07**
Q.3	**(a)**	Explain the three phase rotating magnetic field theory for induction motor.	**07**
	(b)	An eight pole D.C. shunt generator with 778 wave connected armature conductors running at 500 r.p.m. supply a load of 12.5ohm resistance at terminal voltage of 250V. The armature and field resistance of 0.24ohms and 250ohms respectively. Find generated emf and flux per pole.	**07**
		OR	
Q.3	**(a)**	What are the merits and demerits of three phase induction motor? Also compare squirrel cage and slip ring type induction motor.	**07**
	(b)	A 25KVA transformer has 500 turns on the primary and 50 turns on the secondary winding. The primary is connected to 3000V 50Hz supply. Calculate full load primary current, secondary current and maximum flux in the core.	**07**
Q.4	**(a)**	What are the causes and demerits of low power factor?	**07**
	(b)	Compare A.C and D.C transmission system.	**07**
		OR	
Q.4	**(a)**	Compare outdoor and indoor substation.	**07**
	(b)	Explain different losses in D.C machines.	**07**
Q.5	**(a)**	Explain the full-wave rectifier with necessary circuit and wave form.	**07**
	(b)	Explain speed control methods for D.C shunt motor.	**07**
		OR	
Q.5	**(a)**	Discuss and draw the truth table for AND, NAND, OR, NOR and NOT logic gates.	**07**
	(b)	Explain the transformer on NO-LOAD.	**07**

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