Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–II • EXAMINATION – SUMMER 2013

Subject Code: X21901 **Date: 06-06-2013**

Subject Name: Electrical Machines and Electronics

Time: 02.30 pm - 05.00 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 internal and external characteristics of D.C. shunt generator.	**07**
	(b)	What is voltage regulation? Discuss voltage regulation by synchronous impedance method for Alternator.	**07**
Q.2	**(a)**	Explain voltage build up process of d.c .generator. Derive the emf equation of D.C. generator.	**07**
	(b)	A 30 KW, 300 V d.c. shunt generator has armature and field resistances of 0.05 ohm and 100 ohm respectively. Calculate the total power developed by the armature when it delivers full load output.	**07**
		OR	
	(b)	Derive the equations for armature torque and shaft torque for d.c. Motor.	**07**
Q.3	**(a)**	Explain the 3-phase rotating magnetic field theory for induction motor.	**07**
	(b)	State types of transformers based on its construction. Discuss the use of breather, bushings and conservators in a transformer.	**07**
		OR	
Q.3	**(a)**	Define the term ‘slip’ of induction motor. Draw and explain the torque-slip characteristics of three phase induction motor.	**07**
	(b)	Write short note on (i) capacitor start capacitor run motor.(ii) 1-phase shaded pole (iii) universal motor.	**07**
Q.4	**(a)**	Explain different types of equipments used in	**07**

substation.

	(b)	What are the causes of poor power factor. Also explain the methods of power factor improvement	**07**

OR

Q.4	**(a)**	Explain De-Morgan rules with suitable logic circuit.	**07**
Q.4	**(b)**	State different types of tariffs. Explain any two of them.	**07**
Q.5	**(a)**	Explain the pin diagram of 8085 micro-processor.	**07**
	(b)	Explain full wave rectifier with necessary circuit and waveforms.	**07**

OR

Q.5	**(a)**	Discuss AND, OR ,NOR ,NOT,NAND, Ex-OR and Ex-NOR logic gates with their truth tables.	**07**
	(b)	Compare AC and DC transmission ., state advantages of high transmission voltage.	**07**