Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC– SEMESTER II– • EXAMINATION –WINTER- 2016

Subject Code: X20903 Date:04//01/2017

Subject Name: Electrical Machine- 1 & 2

Time:02:30 PM to 5:00 PM Total Marks: 70

Instructions:

1. **Attempt any five questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Explain no load and load characteristics of DC generator.	**07**
	(b)	What are the differences between DC generator and DC motor. Also derive the e.m.f. equation of DC generator.	**07**
Q.2	**(a)**	Explain the types of DC motors with diagram.	**07**
	(b)	Explain the methods of speed control of DC motors.	**07**
Q.3	**(a)**	Why starter is use in DC motor? Explain three point starter with diagram.	**07**
	(b)	A DC shunt motor runs at a speed of 1000 rpm on no load taking a current of 6A from the supply, when connected to 220 V DC supply. Its full load current is 50A. Calculate its speed on full load. Assume Ra = 0.3 Ω and Rsh = 110 Ω.	**07**
Q.4	**(a)**	Explain construction and working principle of 1-phase transformer .	**07**
	(b)	An ideal 25 KVA transformer has 500 turns on the primary winding and 40 turns on the secondary winding. The primary is connected to 3000 V, 50 Hz supply. Calculate: (1) Primary and secondary currents on full load (2) Secondary emf (3) Maximum core flux	**07**
Q.5	**(a)**	Explain equivalent circuit of 1-phase transformer.	**07**
	(b)	Explain open circuit and short circuit test on 1-phase transformer.	**07**
Q.6	**(a)**	Explain torque-slip characteristics of 3-phase induction motor. What is slip? What is the frequency of rotor current?	**07**
	(b)	A 3-phase, 400 V, 50 Hz, 4 pole induction motor has star connected stator winding. The rotor resistance and reactance are 0.1Ω and 1Ω respectively. The full load speed is 1440 rpm. Calculate the torque developed on full load by the motor. Assume stator to rotor ratio as 2:1	**07**
Q.7	**(a)**	Explain construction and working principle of synchronous motor.	**07**
	(b)	What is voltage regulation of alternator? Explain any one method to find voltage regulation of alternator.	**07**

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