Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC- SEMESTER–II - EXAMINATION – SUMMER 2017

Subject Code: X20903 **Date:03/06/2017**

Subject Name: ELECTRICAL MACHINES I & II

Time: 10:30 AM to 01:00 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 the methods of speed control of D.C. shunt and series motors.	**07**
	(b)	Explain construction and working of single phase transformer.	**07**
Q.2	**(a)**	Discuss characteristics of D.C. shunt and series motors with neat sketch.	**07**
	(b)	A D.C. series motor having of 1.5 Ω resistance between terminals runs at 1000 rpm at 230 V with an input current of 12 A. Find the motor speed when it is connected in series with a 4 Ω resistance taking same current at the same supply voltage.	**07**
Q.3	**(a)**	Derive the torque equation of a three phase induction motor. Draw & explain torque-speed characteristics for the motor.	**07**
	(b)	A 4 KVA, 200/400 V, 50 Hz single phase transformer has equivalent resistance referred to primary as 0.15 Ω. Calculate: (i) The total copper losses on full load. (ii) The efficiency while supplying full load at 0.9 power factor lagging. (iii)The efficiency while supplying half load at 0.8 power factor leading. Assume total iron losses equal to 60 Watt.	**07**
Q.4	**(a)**	Describe the construction and working of a salient pole type synchronous generator.	**07**
	(b)	Compare three phase induction motor with synchronous motor.	**07**
Q.5	**(a)**	Discuss the difference between DC generator and DC motor. Derive emf equation of DC generator.	**07**
	(b)	What is voltage regulation of alternator? What are the methods to find it? Explain any one method in detail.	**07**
Q.6	**(a)**	Define efficiency. Explain the indirect tests to find out efficiency of a single phase transformer.	**07**
	(b)	A 8 pole, three phase induction motor is supplied from 50 Hz a.c. supply. On full load, the frequency of induced emf in rotor is 2 Hz. Find the full load slip and the corresponding speed.	**07**
Q.7	**(a)**	Explain no load and load condition on single phase transformer with diagrams.	**07**
	(b)	What is the importance of equivalent circuit of transformer? Explain equivalent circuit of single phase transformer.	**07**

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