Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– IV(NEW) EXAMINATION – SUMMER 2015

Subject Code: 2142407 **Date:01/06/2015**

Subject Name:ELECTRICAL MACHINES & MEASUREMENT

Time:10:30am-1.00pm **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 torque-current, speed-current and speed-torque characteristic of dc shunt and series motor.	**07**
	(b)	Explain open circuit and short circuit test of single phase transformer	**07**
Q.2	**(a)**	Explain the necessity of starter in a dc motor? Explain three-point starter with neat sketch	**07**
	(b)	Explain necessary conditions for parallel operation of 3 phase transformers.	**07**
		OR	
	(b)	Define 1. Back EMF in dc motor 2. Armature reaction in dc m/c 3 Voltage regulation in transformer.	**07**
Q.3	**(a)**	A 4-pole, long-shunt lap wound generator supplies 25 kW at a terminal voltage of 500 V. The armature resistance is 0.03 Ω, series field resistance is 0.04 Ω and shunt field resistance is 200 Ω. The brush drop may be taken as 1V.Determine the e.m.f. generated. Also calculate the No. of conductors if the speed is 1200 r.p.m. and flux per pole is 0.02 Weber. Neglect armature reaction.	**07**
	(b)	With the help of sketches, describe the main construction and working principle of a DC generator.	**07**
		OR	
Q.3	**(a)**	A 40 kVA, single phase transformer has 400 turns on primary and 100 turns on secondary. The primary is connected to 2000 V.50 Hz supply. Determine: (i) The secondary Voltage on open circuit. (ii) The current following through the two windings on full load.(iii) The maximum value of flux.	**07**
	(b)	Explain speed control methods of dc shunt motor.	**07**
Q.4	**(a)**	Explain measurement of inductance with the help of Hay's Bridge. Write advantages and disadvantages of Hay's Bridge.	**07**
	(b)	Explain the working of digital volt meter with schematic block diagram.	**07**
		OR	
Q.4	**(a)**	Explain two wattmeter method used to measure power of a 3-phase balanced load	**07**
	(b)	Explain working of Kelvin's double bridge for measurement of low resistance with neat diagram.	**07**
Q.5	**(a)**	Define and explain: (1)Accuracy (2) Precision	**07**
	(b)	State different errors in measurement and explain any three	**07**
		OR	
Q.5	**(a)**	Explain extension of range of voltmeter and ammeter.	**07**
	(b)	Discuss the conditions to be satisfied for a self-excited generator	**07**

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