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

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III (OLD) - EXAMINATION – SUMMER 2017

Subject Code: 130904 **Date: 07/06/2017**

Subject Name: Electrical Machines-1

Time: 10:30 AM to 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)**	Explain working principle of DC motor also list types of DC motors	**07**
	(b)	Explain voltage build up process of DC shunt generator	**07**
Q.2	**(a)**	Explain three point starter of DC motor	**07**
	(b)	Explain critical resistance for DC shunt generator. also derive E.M.F equation of a DC generator	**07**
		OR	
	(b)	A 220 V ,D.C shunt motor at no-load takes a current of 2.5 A. The resistance of the armature and shunt field are 0.8 Ω and 200 Ω respectively. Estimate the efficiency of the DC motor by swinburne's test when the input current is 20 A.	**07**
Q.3	**(a)**	Explain torque-slip characteristics of three phase induction motor	**07**
	(b)	Explain working principle of three phase induction motor	**07**
		OR	
Q.3	**(a)**	Explain various methods of measurement of slip of three phase induction motor	**07**
	(b)	A 12-pole ,3-phase ,600 V ,50 Hz , star-connected induction motor has rotor-resistance and stand-still reactance of 0.03 and 0.5 ohm per phase respectively. Calculate (a) Speed of maximum torque (b) ratio of full load torque to maximum torque, if the full-load speed is 495 rpm.	**07**
Q.4	**(a)**	Explain open circuit and short circuit test of single phase transformer to determine voltage regulation and efficiency.	**07**
	(b)	Explain operation of single phase transformer at no load and on load with vector diagram	**07**
		OR	
Q.4	**(a)**	Explain auto transformer	**07**
	(b)	Explain necessary and desirable conditions for parallel operation of single phase transformers	**07**
Q.5	**(a)**	Explain pitch factor and distribution factor of alternator	**07**
	(b)	Explain synchronous impedance method to determine the voltage regulation of alternator	**07**
		OR	
Q.5	**(a)**	Explain conditions of parallel operation of synchronous generators	**07**
	(b)	Explain MMF method to determine the voltage regulation of alternator	**07**

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