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

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI- EXAMINATION – SUMMER 2016

Subject Code:160901 **Date:19/05/2016**

Subject Name:Electrical Machine - III

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 field's test for finding the efficiency of D.C. series machine	**07**
	(b)	Hopkinson test on two shunt machines gave the following test result for full load: Line voltage 250V, line current excluding field currents 50 A, motor armature current 380 A, field currents 5A and 4.2 A. Calculate efficiency of each machine. The armature resistance of each machine is 0.02 ohm.	**07**
Q.2	**(a)**	Explain Break test for D.C. machine.	**07**
	(b)	Explain two reaction theory of salient pole synchronous machine.	**07**
		OR	
	(b)	Explain hunting of synchronous machine and method of its prevention.	**07**
Q.3	**(a)**	Explain three phase Induction regulators.	**07**
	(b)	A 4 pole, 50 Hz star connected alternator has a flux per pole of 0.12 Wb. It has 4 slots per pole per phase, conductor per slots being 4. If the winding coil span is 150^0, find the emf.	**07**
		OR	
Q.3	**(a)**	The data obtained on 100 KVA ,1100V, 3phase alternator is : DC resistance test, E between line is 6 V, I in lines is 10 A dc Open circuit test: field current is 12.5 A dc , line voltage is 420 V ac Short circuit test, field current is 12.5 A line current is rated value. Calculate the voltage regulation of alternator at 0.8 pf lagging.	**07**
	(b)	State the necessary conditions for paralleling the alternators. Explain one dark and two bright lamp method with electrical circuit diagram.	**07**
Q.4	**(a)**	List different methods for finding the voltage regulation of an alternator and discuss ZPF method in detail.	**07**
	(b)	Describe the slip test for determining Xq and Xd in salient pole synchronous machine with circuit diagram.	**07**
		OR	
Q.4	**(a)**	Explain V curves and inverted V curves of synchronous motor.	**07**
	(b)	Why synchronous motor is not self-starting? Explain the methods of starting of synchronous motor.	**07**
Q.5	**(a)**	Explain the operation of A.C. servomotor.	**07**
	(b)	Write a short note on auto synchronous motor.	**07**
		OR	
Q.5	**(a)**	Explain the working of switch reluctance motor.	**07**
	(b)	Explain the operation of permanent magnet brushless D.C. motor.	**07**

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