Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– II(Old course) • EXAMINATION (Remedial) – WINTER- 2015

Subject Code: 1720701 **Date: 09/12/2015**

Subject Name: Advanced Electrical Machines

Time:2:30 pm to 5:00 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 the working principle of BLDC machine. Explain difference between BLDC machine and synchronous machine.	**07**
	(b)	Classify the PMBLDC Machine. Explain difference between BLDC machine and Brushed DC machine.	**07**
Q.2	**(a)**	Explain micro stepping control of a stepper motor.	**07**
	(b)	Explain construction and working of a switched reluctance motor with one power converter for its operation.	**07**
		OR	
	(b)	Explain construction and working principle of Construction and working of Permanent Magnet (PM) stepper motor.	**07**
Q.3	**(a)**	How linear induction machine is different than conventional induction machine? Explain usefulness and applications, where it preferred.	**07**
	(b)	Discuss essential elements in condition monitoring system. Explain the principle of hall effect devices and their benefits over other sensors.	**07**
		OR	
Q.3	**(a)**	Discuss fault detection techniques and suggest diagnosis methods for an induction motor.	**07**
	(b)	Discuss the basic concepts of energy efficient motor.	**07**
Q.4	**(a)**	Discuss reactive power compensation of wind mill generator.	**07**
	(b)	Define Efficiency and the methods to find out the efficiency of the motor	**07**
		OR	
Q.4	**(a)**	State different types of wind mill generators. Compare conventional synchronous generator and induction generator.	**07**
	(b)	Define energy and co-energy in an electromechanical energy conversion. Derive the expression for the field energy in terms of system variables.	**07**
Q.5	**(a)**	Carry out transformation of a balanced set from (a,b,c) to (d,q,0) reference frame.	**07**
	(b)	Discuss block diagram of typical electromechanical system. Explain energy balance in such system.	**07**
		OR	
Q.5	**(a)**	What is significance of transformation equations in a reference frame theory? Derive the relation $P_{qdos} = P_{abcs} = 3/2\ (v_{qs}i_{qs} + v_{ds}i_{ds} + 2v_{os}i_{os})$.	**07**
	(b)	Explain torque angle characteristic of stepper motor.	**07**

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