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

GUJARAT TECHNOLOGICAL UNIVERSITY

ME Semester –II Examination Dec. - 2011

Subject code: 1720701 **Date: 09/12/2011**

Subject Name: Advanced Electrical Machines

Time: 02.30 pm – 05.00 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)**	Discuss converter fed BLDC drive. Discuss performance for 120°conduction period.	**07**
	(b)	Explain the working principle of BLDC machine. Explain difference between BLDC machine and synchronous machine.	**07**
Q.2	**(a)**	Determine the expression for fqs, fds and fos for fas=cos(t), fbs= (1/2)t, fcs= -sin(t), assume $\theta(0)= -\pi/12$ and $\omega=1$ rad/sec, for $t= \pi/3$.	**07**
	(b)	Explain energy relationship in electromechanical system.	**07**
		OR	
	(b)	Derive winding inductances and voltage equations for induction machine. Mention assumptions made for derivation.	**07**
Q.3	**(a)**	Explain Bifilar Winding Type Converter used for S.R.M	**07**
	(b)	With proper diagram explains the working of (n+1) Converter used for S.R.M.	**07**
		OR	
Q.3	**(a)**	Discuss typical root causes and failure modes of electrical machines. How condition monitoring can help in diagnosis of machine health.	**07**
	(b)	Detection and diagnosis technique for induction motor.	**07**
Q.4	**(a)**	Explain concept of micro stepping control of stepper motor.	**07**
	(b)	Explain in brief construction and working principle of hybrid stepper motor. Compare VR, permanent magnet and hybrid step motor characteristics based on step angle, phases, drive type and rotor inertia.	**07**
		OR	
Q.4	**(a)**	Explain direct saving and pay back analysis of energy efficiency motor.	**07**
Q.4	**(b)**	Explain torque angle characteristic of stepper motor.	**07**
Q.5	**(a)**	Compare wind mill generator with synchronous generator. How constant voltage and frequency is achieved in the wind mill generator.	**07**
	(b)	Classify the PMBLDC Machine and Explain the construction in details.	**07**
		OR	
Q.5	**(a)**	How linear induction machine is different than conventional induction machine? State the Advantage and Disadvantage.	**07**
	(b)	Discuss fault detection and diagnosis technique for transformer.	**07**

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