GUJARAT TECHNOLOGICAL UNIVERSITY
ME- SEMESTER II– EXAMINATION – SUMMER 2015

Subject Code: 2720715   **Date: 28/05/2015**

Subject Name: Electrical Machine Modeling & Analysis

Time: 2:30 PM – 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)**	Which are the commonly used reference frames & explain in brief how transformation takes places between reference frames?	**07**
	(b)	Explain the modeling of electromechanical energy conversion takes place in electromagnetic circuit.	**07**
Q.2	**(a)**	Derive the torque equation in machine variables of PMBLDC machine.	**07**
	(b)	Explain free acceleration characteristic of an induction machine using different references.	**07**
		OR	
	(b)	Explain the performance of induction machine during sudden change in load torque using dynamic model.	**07**
Q.3	**(a)**	Derive the voltage equation in arbitrary reference frame variables of a induction machine.	**07**
	(b)	Analysis the induction machine performance when a three phase fault occurs at the machine terminals using dynamic model.	**07**
		OR	
Q.3	**(a)**	Derive the voltage equation in machine variable of an induction machine.	**07**
	(b)	Analysis the steady state operation of an induction machine.	**07**
Q.4	**(a)**	For a synchronous machine, derive voltage equations in rotor reference frame variables.	**07**
	(b)	Derive the torque equation in machine variables for a synchronous machine.	**07**
		OR	
Q.4	**(a)**	Analysis the steady state operation of synchronous machine.	**07**
	(b)	Explain dynamic performance of a synchronous machine during the sudden change in input torque.	**07**
Q.5	**(a)**	Explain in brief the procedure of linearization of machine equations.	**07**
	(b)	Explain the modeling of magnetically coupled circuit.	**07**
		OR	
Q.5	**(a)**	Explain the thermal model of induction machine.	**07**
	(b)	Explain balanced steady state phasor relationship & voltage equations in arbitrary reference frame.	**07**

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