Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – SUMMER • 2014

Subject code: 1724501 **Date: 16-06-2014**

Subject Name: Solid State A. C. Drives

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)**	Explain Constant Volt/Hz operation of induction motor using different induction motor characteristics.	**07**
	(b)	Explain stationary frame a-b-c to ds-qs transformation of induction motor model? What is the necessity of it?	**07**
Q.2	**(a)**	Explain slip power recovery method for induction motor.	**07**
	(b)	What is the difference between scalar control and vector control of induction motor drives? Explain merit and demerits of it.	**07**
		OR	
	(b)	Explain speed control of induction motor with closed loop torque and flux control for v/f control with help of block diagram.	**07**
Q.3	**(a)**	Explain principle of vector control of induction motor drives with the help of block diagram.	**07**
	(b)	Explain how flux vector estimation is to be done for direct vector control of IM drives.	**07**
		OR	
Q.3	**(a)**	Explain Indirect vector control of induction motor drives with help of block diagram for open loop flux control.	**07**
	(b)	What is the principle of Direct torque control of induction motor drives? How it is differ from field control?	**07**
Q.4	**(a)**	Explain control strategy for DTC drives with help of block diagram.	**07**
	(b)	Explain how the sectors are identified for switching of inverter switch in DTC.	**07**
		OR	
Q.4	**(a)**	What is the difference between direct vector control method and indirect vector control method of induction motor	**07**
	(b)	Explain D.C drive analogy of induction motor with the help of vector diagram and block diagram.	**07**
Q.5	**(a)**	How the flux vector estimation is to be done for indirect vector control method?	**07**
	(b)	Explain principle of sensorless vector control method for IM ? List out the different method of speed estimation. Explain one of the methods.	**07**
		OR	
Q.5	**(a)**	Explain Brush and Brushless d.c. excitation for wound field synchronous machine.	**07**
	(b)	Explain load commutated current fed Inverter for wound field synchronous motor.	**07**

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