Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII • EXAMINATION – WINTER • 2014

Subject Code: 172402 **Date: 02-12-2014**

Subject Name: Industrial Drives and Control-II

Time: 10:30 am - 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)**	Draw the Block Diagram of Power Electronics Motor Drive and Explain functionality and working of each block in detail.	**07**
	(b)	Explain torque/speed characteristic of 3-Phase induction motor.	**07**
Q.2	**(a)**	Discuss IM's behavior for non-sinusoidal source voltages.	**07**
	(b)	Discuss stator voltage control method for (i) Constant load –torque (ii) Fan type loads.	**07**
		OR	
	(b)	Explain the principle behind the variation of the speed of a 3-Φ IM by v/f method. Discuss this for the following two different modes: 1. Operation below rated frequency 2. Operation above rated frequency.	**07**
Q.3	**(a)**	"Variable frequency operation is possible with synchronous motor" .Justify the statement.	**07**
	(b)	Explain concept of Slip power. Discuss it with Basic Kramer Drive.	**07**
		OR	
Q.3	**(a)**	Explain the operation of a synchronous motor fed from an adjustable frequency current source with circuit diagram and characteristics curve.	**07**
	(b)	With the help of suitable diagrams discuss Scherbius drive.	**07**
Q.4	**(a)**	Write a short note: Dynamic d-q model of Induction Motor.	**07**
	(b)	Discuss Principle of vector control with necessary diagram.	**07**
		OR	
Q.4	**(a)**	Explain the difference between Rotor and Stator Reference Frame.	**03**
	(b)	Explain difference between scalar voltage control and vector voltage control.	**07**
Q.5	**(a)**	Explain the concept of sensor less control of induction motor.	**07**
	(b)	Enlist various control methods for speed control of SRM. Discuss any one in brief.	**07**
		OR	
Q.5	**(a)**	With the help of suitable diagram, explain self-controlled synchronous motor drive using load commutated thyristor inverter."	**07**
	(b)	Describe permanent magnet AC motor drive.	**07**

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