GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER– VII (New) EXAMINATION – WINTER 2019

Subject Code: 2172402   **Date: 23/11/2019**

Subject Name: Industrial Drives & Control-II

Time: 10:30 AM TO 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)**	Define Power Electronics. Explain advantage and disadvantage of Power Electronics.	**03**
	(b)	Explain the four function of Power Electronics Modulator in Electric Motor Drive	**04**
	(c)	Define Electric Motor Drive. Draw the detailed block diagram of AC Motor Drive and explain its advantages and disadvantages over DC Motor Drive.	**07**
Q.2	**(a)**	List and describe in brief speed control methods for AC motor.	**03**
	(b)	Explain why the control of a three-phase indication motor is more difficult than D.C. motors.	**04**
	(c)	Draw and Explain block diagram of single quadrant closed loop speed control of 3-Φ IM using 3-Φ Voltage controller.	**07**
		OR	
	(c)	Draw and Explain block diagram of four quadrant closed loop speed control of 3-Φ IM using 3-Φ Voltage controller.	**07**
Q.3	**(a)**	Explain concept of Field Oriented Control.	**03**
	(b)	Draw the Speed torque curve of an IM with Unbalanced Stator Voltage and Single Phasing diagram with necessary nomenclature:	**04**
	(c)	Compare FCCSI and LCCSI in terms of motor type, power, Speed range, accuracy, maximum speed, performance, advantage, disadvantage and application.	**07**
		OR	
Q.3	**(a)**	Explain concept of Direct Torque Control.	**03**
	(b)	Draw the Open Circuit and Closed Circuit Transition of Auto Transformer Starter diagram with necessary nomenclature:	**04**
	(c)	Compare Kramer Drive and PWM VSI in terms of motor type, power, Speed range, accuracy, maximum speed, performance, advantage, disadvantage and application.	**07**
Q.4	**(a)**	Discuss the dynamic modeling of Induction machines in brief giving necessary equations and figures.	**03**
	(b)	List the breaking method of Induction Motor and explain plugging with necessary diagram.	**04**
	(c)	Draw and explain indirect vector control block diagram with open loop flux control	**07**
		OR	
Q.4	**(a)**	State why is dynamic model required to derive over steady state model and the necessary assumptions made to derive the dynamic model.	**03**
	(b)	List the breaking method of Induction Motor and explain regenerative with necessary diagram.	**04**
	(c)	Explain the block diagram of direct vector control with rotor flux orientation. Draw necessary Phasor diagrams.	**07**
Q.5	**(a)**	List different converters for SRM drives.	**03**
	(b)	List the starting method of Induction Motor and explain star delta starter with necessary diagram.	**04**
	(c)	Draw and explain four phase SRM drive using waveform explaining commutation angle generation for one phase.	**07**
		OR	
Q.5	**(a)**	Write Technical note on : Sinusoidal PMAC motor drive	**03**
	(b)	List the starting method of Induction Motor and explain autotransformer starter with necessary diagram.	**04**
	(c)	Explain principle of direct torque control scheme using necessary block diagram and switching logic.	**07**

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