Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– I (New course)• REMEDIAL EXAMINATION – SUMMER 2015

Subject Code: 2710709 **Date:16/05/2015**

Subject Name: Electrical Drives

Time: 10:30 am to 1:00 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 and explain block diagram of an electric drive and significance of each block.	**07**
	(b)	Explain with neat diagram the four quadrant operation of hoist/wrench.	**07**
Q.2	**(a)**	What is Dual converter? Draw and explain how the circulating current is controlled in dual converter with simultaneous control.	**07**
	(b)	What is the significance of controlled fly-wheeling? Explain the continuous current mode of operation for motoring and regenerative braking for separately excited DC motor fed from 1-phase fully controlled rectifier.	**07**
		OR	
	(b)	Derive the condition for steady state stable operation of an electric motor and explain its significance with suitable examples for AC and DC motors.	**07**
Q.3	**(a)**	Explain semiconductor converter based controlled dynamic braking and composite braking of DC motor.	**07**
	(b)	Explain working of DC-DC converter based multi quadrant drive.	**07**
		OR	
Q.3	**(a)**	For a doubly fed wound rotor induction motor, discuss the sub-synchronous motoring and sub-synchronous braking operation.	**07**
	(b)	Explain AC-AC converter based three phase induction motor speed control.	**07**
Q.4	**(a)**	Explain working of six step inverter.	**07**
	(b)	With neat diagram explain any one closed-loop control scheme for controlling the speed of a VSI fed induction motor.	**07**
		OR	
Q.4	**(a)**	Explain the CSI based induction motor drive system.	**07**
	(b)	Discuss the operation of a cylindrical rotor synchronous motor operating from a current source.	**07**
Q.5	**(a)**	Derive the equation of torque for a wound field salient pole synchronous motor operating from a voltage source of constant frequency. Hence, draw the torque angle characteristics for the same.	**07**
	(b)	Write a brief note on modified Kramer drive.	**07**
		OR	
Q.5	**(a)**	Write a brief note on static static scherbius drive.	**07**
	(b)	Write a brief note on braking methods for synchronous motor.	**07**

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