Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI • EXAMINATION – SUMMER • 2015

Subject Code: 162404 **Date:14/05/2015**

Subject Name: Industrial Drives & Control-1

Time:10.30am-01.00pm **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 & Explain Basic Block Diagram of DC drive.	**07**
	(b)	List Advantages & Disadvantages of DC Drive.	**07**
Q.2	**(a)**	Write a short note on Ward Leonard System.	**07**
	(b)	Derive Torque equation of DC motor indicating Dynamics of Electrical Drive.	**07**
		OR	
	(b)	List various methods of speed control of dc shunt motor. Explain any two in detail	**07**
Q.3	**(a)**	Explain braking of separately excited dc Motor using chopper circuit with waveforms.	**07**
	(b)	Draw & Explain waveforms of 1- Φ fully controlled converter with freewheeling diode for Separately Excited DC Motor.	**07**
		OR	
Q.3	**(a)**	Explain Motoring operation of chopper controlled separately excited dc Motor.	**07**
	(b)	Draw circuit diagram & waveforms for 3- Φ fully controlled converter with $\alpha = 30^o$ for Separately Excited DC Motor. Derive the equation for output voltage.	**07**
Q.4	**(a)**	Discuss circulating type dual converter with necessary diagram.	**07**
	(b)	Explain four quadrant operation of chopper for RLE load.	**07**
		OR	
Q.4	**(a)**	With the help of Block diagram explain Closed loop control for DC drive.	**07**
	(b)	Differentiate Permanent Magnet Drive & Servo Motor Drive.	**07**
Q.5	**(a)**	A 80KW, 440V, 800 rpm D.C. motor is operating at 600 rpm & developing 75% of rated torque is controlled by 3-Φ, six pulse thyristor converter. If the back emf at rated speed is 410 V, determine the triggering angle of the converter. The input to the converter is 3-Φ, 415V, 50Hz supply.	**07**
	(b)	Explain Micro computer control of DC Drives using block Diagram.	**07**
		OR	
Q.5	**(a)**	An RLE type load is operating in a chopper circuit from a 400V D.C. supply. For the load L = 0.05H & R=0 & for a duty cycle of 0.3, find the chopping frequency to limit the amplitude of the load current excursion to 8A.	**07**
	(b)	Short Note on PLL based DC drive.	**07**

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