Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) - EXAMINATION – SUMMER 2016

Subject Code:2162404 **Date:06/05/2016**

Subject Name: Industrial Drives & Control-I

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)**	Draw & Explain basic block diagram of DC drive.	**07**
	(b)	Write a short note on Ward Leonard System.	**07**
Q.2	**(a)**	Derive torque equation of DC motor indicating Dynamics of Electrical Drive.	**07**
	(b)	Explain the two quadrant operation of Chopper Controlled separately excited DC motor with necessary diagram.	**07**
		OR	
	(b)	Explain braking of separately excited dc Motor using chopper circuit with waveforms.	**07**
Q.3	**(a)**	Discuss transfer function of field controlled dc motor.	**07**
	(b)	A separated excited D.C. motor is fed from three phase six-pulse fully controlled bridge converter. The motor develops its full-load torque at a rated speed of 1800 rpm taking a rated current of 60 A at 440 V. The input to three-phase converter is from an ideal source of 50 Hz. a) Determine the rms value of line voltages input to the converter if motor runs at its rated conditions for delay angle $\alpha = 0^0$. b) What is the range of firing angles for a speed control of 1800 rpm to 900 rpm? The armature resistance is 0.5 ohm.	**07**
		OR	
Q.3	**(a)**	Write a short note on continuous and discontinuous armature current operations.	**07**
	(b)	Explain the closed loop armature control for DC drive using field weakening.	**07**
Q.4	**(a)**	Explain the current ripple and its effect on performance of DC drives.	**07**
	(b)	Explain the constant torque and constant horse power operations.	**07**
		OR	
Q.4	**(a)**	Write merits and demerits of a Dual Converter with & without circulating current.	**07**
	(b)	Write a short note on selection of drive for speed reversal.	**07**
Q.5	**(a)**	Write a short note on permanent magnet motor drive.	**07**
	(b)	Explain the Phase Locked Loop control of DC drives.	**07**
		OR	
Q.5	**(a)**	Explain PID controller for DC drives.	**07**
	(b)	Write a short note on requirement of servo motor drive.	**07**

****