Seat No.:_____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI(NEW) – EXAMINATION – SUMMER 2019

Subject Code:2162404 Date:10/05/2019

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.**
1. **Figures to the right indicate full marks.**

Q.1	**(a)**	Define Electric Motor Drive and Draw block diagram of Electric Motor Drives.	**03**
	(b)	List the comparisons between Active and Passive Load Torque.	**04**
	(c)	Derive torque equation of DC Motor indicating Dynamic of Electric Drive	**07**
Q.2	**(a)**	Define Group Drive, Individual Drive and Multi-motor Drive	**03**
	(b)	List the different types of Speed Control of DC Motor. Explain any one with necessary diagram and equations.	**04**
	(c)	Draw and explain mathematical model of armature controlled DC drive.	**07**
		OR	
	(c)	List the types of Duty in Electrical Motor Drive and Explain each in brief.	**07**
Q.3	**(a)**	Draw Circuit diagram and characteristics of Chopper circuit for braking control.	**03**
	(b)	Explain the comparisons between: Field and Armature Control of DC Motor.	**04**
	(c)	Explain the two quadrant operation of Chopper Controlled separately excited DC motor with suitable diagram.	**07**
		OR	
Q.3	**(a)**	Draw and Explain Static Ward Leonard System.	**03**
	(b)	Explain the comparisons between: Constant Torque and Constant HP Operation.	**04**
	(c)	Explain closed loop control scheme of separately excited DC motor for control of below & above base speed.	**07**
Q.4	**(a)**	Why PI Control is very important in closed loop DC drive system?	**03**
	(b)	Explain the difference between: Circulating & Non Circulating mode of dual converter operation.	**04**
	(c)	Write technical short note on: PLL Based DC Drive.	**07**
		OR	
Q.4	**(a)**	Draw and explain the field current reversible drive.	**03**
	(b)	Explain the comparisons between In phase and phase shifted mode of multiphase chopper.	**04**
	(c)	Using block diagram & necessary flow chart explain working of microcomputer control of DC Drives.	**07**
Q.5	**(a)**	Draw and Explain requirement of servo motor drives.	**03**
	(b)	Draw and explain block diagram of Permanent Magnet DC Motor Drives.	**04**
	(c)	Explain traction drive employing two stage converter feeding four separately excited motors.	**07**
		OR	
Q.5	**(a)**	Explain the selection of drive for speed reversal.	**03**
	(b)	Why Current loop in to be introduced as an inner loop in closed loop operation? Explain with necessary comments.	**04**
	(c)	Define Stability of motor load combination. Explain criteria for steady state stability for using seven possible combination of speed and torque curve of motor and load.	**07**

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