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

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (OLD) - EXAMINATION – SUMMER 2017

Subject Code: 162404 **Date: 03/05/2017**

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)**	Discuss necessities of DC Drives. Draw and explain conventional block diagram of various Drives.	**07**
	(b)	Explain the operation of 1-phase full converter with conventional current condition having high speed & high inductive load for separately excited DC motor at $\alpha = 30^o$. Also draw various wave-forms.	**07**
Q.2	**(a)**	Explain the operation of single phase semi-converter circuit for DC Series Motor with discontinuous armature current condition at $\alpha = 45^o$. Draw various wave – forms.	**07**
	(b)	Derive the formula of speed and torque for DC Series motor for single phase semi-converter and full-converter operation. Also draw the speed-torque characteristics.	**07**
		OR	
	(b)	Derive the equation of speed and torque for separately excited DC shunt motor for single phase full converter. Also draw speed – torque characteristics and control characteristics for the same.	**07**
Q.3	**(a)**	Explain the operation of 3-phase full converter with conventional current condition for separately excited DC motor at $\alpha = 60^o$. Also draw various wave-forms.	**07**
	(b)	Discuss dual converters and its various field of applications.	**07**
		OR	
Q.3	**(a)**	Discuss permanent magnet motor Drive.	**07**
	(b)	Compare P, PI & PID controller.	**07**
Q.4	**(a)**	Draw and explain class A Chopper.	**07**
	(b)	Derive the equation for average output voltage of boost chopper circuit.	**07**
		OR	
Q.4	**(a)**	Discuss importance of PI control for DC Drive.	**07**
	(b)	Explain modelling of DC Motor controlled through armature voltage control.	**07**
Q.5	**(a)**	Discuss microcomputer control of DC Drive with the help of block diagram.	**07**
	(b)	Explain multi-phase chopper circuit. Enumerate its merits & demerits.	**07**
		OR	
Q.5	**(a)**	Explain closed loop control of DC Drive.	**07**
	(b)	Explain Servo Motor Drive.	**07**

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