

# GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2018

**Subject Code: 2171707**

**Date: 15/11/2018**

**Subject Name: Industrial Drives and Control**

**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.

		MARKS
Q.1	(a) List out different selection criteria for the electrical drive.	03
	(b) List Advantages & Disadvantages of DC Drive.	04
	(c) Discuss in brief, Phase Locked Loop (PLL) control of the dc motor drive using block diagram.	07
Q.2	(a) Draw the detailed block diagram indicating all parts of Electrical motor drive.	03
	(b) How to measure motor constants? Explain it in detail.	04
	(c) Explain state space modeling of DC motor drive with block diagram.	07
	<b>OR</b>	
	(c) List the performance parameters of the dc drives. Define each of them.	07
Q.3	(a) Draw the waveforms of 1st quadrant chopper operation for DC motor drive.	03
	(b) Discuss types of Duty cycle for motor operation.	04
	(c) Explain constant Volts/Hz control for induction motor drive.	07
	<b>OR</b>	
Q.3	(a) Explain the working principle of ideal dual converter.	03
	(b) Write brief note on permanent magnet motor drive.	04
	(c) Explain Dynamic and Composite braking of separately excited dc motor with chopper control.	07
Q.4	(a) Discuss merits and demerit of multi-phase chopper circuit.	03
	(b) Write a Technical Note on: Servo Motor DC Drive.	04
	(c) Write a brief note on selection of motor power rating with illustration.	07
	<b>OR</b>	
Q.4	(a) Discuss the effect of free wheeling diode on converter operation.	03
	(b) Explain Current Limit control and Closed loop speed Control.	04
	(c) Derive an expression for average output voltage of boost chopper circuit.	07
Q.5	(a) Explain unipolar drive circuit for stepper motor.	03
	(b) Explain drive circuit for stepper motor.	04
	(c) Explain Traction drive employing two stage converter feeding four separately excited motors.	07
	<b>OR</b>	
Q.5	(a) Draw and explain torque versus stepping rate characteristic of stepper motors.	03
	(b) Explain operation of brushless DC motor.	04
	(c) Explain closed loop speed control scheme for control of below and above base speed	07

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