

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER- VII EXAMINATION-SUMMER 2023

Subject Code: 3172402

Date: 27/06/2023

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.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Compare in brief DC drive and AC drive.	03
	(b) Explain in brief major parts of electric drive.	04
	(c) Discuss the main factors affecting to the choice of electric drive for specific application.	07
Q.2	(a) Draw the equivalent diagram of motor load system with notations and write the fundamental torque equation.	03
	(b) Explain in brief multi quadrant operation of drives.	04
	(c) Explain working of Solar Powered pump drives with diagram.	07
OR		
	(c) Discuss the important features of traction drives.	07
Q.3	(a) Draw and explain in brief speed torque characteristic of separately excited DC motor.	03
	(b) State Important features of DC motor speed control.	04
	(c) Derive the speed-torque equation in terms of firing angle, for the separately excited DC motor supplied by Single phase semi converter.	07
OR		
Q.3	(a) State and explain in brief various types of braking used in DC drives.	03
	(b) Explain the continuous and discontinuous conduction mode of operation for DC-DC converter with waveforms.	04
	(c) Explain the close loop speed control of DC motor with block diagram containing inner loop and outer loop.	07
Q.4	(a) What is scalar control? State merits of scalar control.	03
	(b) Discuss the carrier frequency selection criteria for induction motor drive.	04
	(c) Explain various operating modes of doubly fed induction machine.	07
OR		
Q.4	(a) Define slip control and current limit control of induction motor.	03
	(b) State general features of CSI fed induction motor drive.	04
	(c) Explain Static Scherbius Drive with diagram for induction motor.	07
Q.5	(a) Define Vector Control and also state why it is known as decoupling control.	03
	(b) Explain difference in rotating reference frame and stationary reference frame.	04
	(c) Explain with diagram BLDC motor drive.	07

OR

- Q.5** (a) State principal of vector control with its main two components. **03**
(b) State advantages of converter fed induction motor over line fed motor. **04**
(c) Compare in detail FOC and DTC. **07**
