

GUJARAT TECHNOLOGICAL UNIVERSITY
BE- SEMESTER-VII (NEW) EXAMINATION – WINTER 2024

Subject Code:3172402**Date:04-12-2024****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.

- Q.1** (a) Explain the torque-speed characteristics of DC shunt motor. **03**
 (b) State the advantages of electric drives. **04**
 (c) Write a technical note on: Load Equalization in Electrical drives. **07**
- Q.2** (a) Define electric motor drive. List the applications of electric motor drive. **03**
 (b) Discuss the types and characteristics of load torque. **04**
 (c) Explain the operation of phase controlled converter fed separately excited dc motor with continuous load current. Draw necessary diagram and waveforms. **07**
- OR**
- (c) Explain the dynamic modelling of separately excited dc motor with field control. **07**
- Q.3** (a) Explain modified speed-torque characteristic of separately excited dc motor with external resistance control. **03**
 (b) Explain the concept of v/f control for an induction motor. **04**
 (c) Write technical note on: Static Kramer Drive. **07**
- OR**
- Q.3** (a) Explain modified speed-torque characteristic of dc series motor with external resistance control. **03**
 (b) Compare CSI based drive and VSI based drive in all respect. **04**
 (c) Explain the rotor-resistance control method for wound-rotor induction motor with necessary diagram. **07**
- Q.4** (a) Draw slip-torque characteristics of the induction motor. **03**
 (b) Discuss the concept of Field Oriented Control with the necessary diagram. **04**
 (c) Define Harmonics. Explain the concept of harmonic torques in induction motor with VSI. Draw necessary diagram. **07**
- OR**
- Q.4** (a) Discuss the variable frequency operation of induction motor. **03**
 (b) Discuss the concept of Direct Torque Control with the necessary diagram. **04**
 (c) Explain the operation of chopper fed separately excited dc motor with discontinuous load current. Draw necessary diagram and waveforms. **07**
- Q.5** (a) Draw the block diagram of BLDC machine drive. **03**
 (b) Discuss the concept of stationary reference frame. **04**
 (c) Write a technical note on: Solar Powered Drive. **07**
- OR**
- Q.5** (a) Draw the block diagram of Servo Motor drive. **03**
 (b) Discuss the concept of arbitrary reference frame. **04**
 (c) Discuss the concept of Battery Powered Drives with necessary diagram. **07**