

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2023****Subject Code:3172422****Date:01-12-2023****Subject Name: Advanced Industrial Drives****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) How to choice of Drives? Explain it in details. **03**
 (b) Explain the four functions of Power Electronics Modulator in Electric Motor Drive. **04**
 (c) Explain Construction and Working Principle of PMDC Machine. **07**
- Q.2** (a) Draw the block diagram of Electric Drive and explain it in brief. **03**
 (b) Explain Applications of Electrical Drive System. **04**
 (c) Explain Principle of Operation and Control of SRM machine. **07**
- OR**
- (c) Sketch and explain the Torque Speed Characteristics of PMSM Motor and list the Various Application of PMSM Motor. **07**
- Q.3** (a) Discuss in brief Switched Reluctance Motor Characteristics. **03**
 (b) Make a Comparison Chart for Application of Linear Reluctance Motor and Linear Synchronous Machine. **04**
 (c) Explain Open Loop and Closed Loop Control of Servo Motor. **07**
- OR**
- Q.3** (a) Discuss in brief Microcontroller based Control of Stepper Motor. **03**
 (b) Derive Construction and Working of DC Linear Motor. **04**
 (c) What is the difference between Microprocessor, DSP and Microcontroller based control for PMAF machine? Explain any one Control of PMAF Machine. **07**
- Q.4** (a) Discuss in brief Control Strategies of PMSM Motor. **03**
 (b) Compare PMDC and BLDC Motor. **04**
 (c) Derive the Thrust Equation of an LIM. **07**
- OR**
- Q.4** (a) Discuss in brief Control Strategy for Linear Induction Motor. **03**
 (b) Which are the types of Linear Induction Machine? Discuss its features in brief. **04**
 (c) Explain in details Direct Vector Control Method for AC Drives. **07**
- Q.5** (a) Explain in brief about Losses in Electric Drive System. **03**
 (b) Discuss Direct Saving and Payback Analysis. **04**
 (c) Explain in details about Harmonics Reduction & Mitigation technique. **07**
- OR**
- Q.5** (a) Discuss Standard Motor Efficiency in Electrical Drives. **03**
 (b) Define Power Factor. Discuss Power Factor Improvement Technique. **04**
 (c) Write a Technical Note on: - Energy Efficient Motor. **07**
