

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – SUMMER 2021****Subject Code:2172402****Date:03/08/2021****Subject Name:Industrial Drives & Control-II****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) Explain basic principle of speed control of IM. **03**
 (b) Compare AC motor drives with DC motor drives. **04**
 (c) Discuss operation of induction motor on unbalanced source voltage with necessary equation. **07**
- Q.2** (a) Draw Torque slip characteristics of IM. **03**
 (b) Define power factor and state methods of improving power factor. **04**
 (c) Explain the principle behind the variation of the speed of a 3- Φ IM by v/f method for Operation below rated frequency. **07**
- OR**
- (c) Explain speed control of IM using power electronics converter for Rotor Resistance method **07**
- Q.3** (a) Derive equation for slip power. **03**
 (b) Explain super synchronous speed operation of IM. **04**
 (c) Discuss Induction motors fed by PWM frequency inverters. **07**
- OR**
- Q.3** (a) Explain principles of synchronous motor control. **03**
 (b) Discuss block diagram of Inverter Fed Open Loop Synchronous Motor Drive. **04**
 (c) Explain self – controlled synchronous motor drive using load commutated Thyristor inverter. **07**
- Q.4** (a) Enlist speed control methods for synchronous motor. **03**
 (b) Explain the Principle of Vector control. **04**
 (c) Discuss reference frame theory for induction motor in brief. **07**
- OR**
- Q.4** (a) State advantages of static scherbius system over static Kramer drive. **03**
 (b) Compare FCCSI and LCCSI in terms of motor type, power, Speed range, accuracy, maximum speed, performance. **04**
 (c) Write a short note: Dynamic d-q model of Induction Motor. **07**
- Q.5** (a) List the braking method of Induction Motor. **03**
 (b) Draw indirect vector control block diagram with open loop flux control. **04**
 (c) Explain principle of direct torque control scheme using necessary block diagram and switching logic. **07**
- OR**
- Q.5** (a) Draw block diagram of feed-forward vector control for IM. **03**
 (b) Explain the basic principle of DTFC for Voltage fed PWM inverter drives. **04**
 (c) Discuss trapezoidal PMAC motor drive for servo application. **07**
