

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII(NEW) EXAMINATION – SUMMER 2019****Subject Code:2172402****Date:10/05/2019****Subject Name:Industrial Drives & Control-II****Time:02:30 PM TO 05:00 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) Compare CSI with VSI giving three points. **03**
(b) Explain CSI control for Induction Motor. **04**
(c) Describe the analysis of Induction Motor with (1) Unbalanced rotor impedances & (2) Non-sinusoidal voltage supply. **07**
- Q.2** (a) Explain induction motor drive fed from VSI. **03**
(b) Discuss drawback of IM Drive fed from a stepped wave Inverter. **04**
(c) What are the similarities between a brushless dc motor and a conventional dc motor? Why it is known as a brushless dc motor? Enlist its advantages over a conventional dc motor. **07**
- OR**
- (c) Discuss trapezoidal PMAC motor drive for servo application. **07**
- Q.3** (a) Discuss advantages of stator voltage control method for constant load-torque. **03**
(b) Discuss advantages of stator voltage control method for Fan type loads. **04**
(c) Discuss IM's behavior for non-sinusoidal source voltages. **07**
- OR**
- Q.3** (a) Draw block diagram of a dc link converter for multi-motor ac drive. **03**
(b) Explain the derivation of stator reference frame model. **04**
(c) Explain the principle behind the variation of the speed of a 3- Φ IM by v/f method. Discuss this for the operation below and above rated frequency. **07**
- Q.4** (a) Draw the circuit for self-controlled synchronous motor drive using load commutated thyristor-based inverter. **03**
(b) Discuss reference frame theory for induction motor in brief. **04**
(c) Draw and explain the thyristor configuration for a stator voltage controlled reversible-speed Induction Motor Drive. Also draw the speed-torque characteristics for a reversible induction motor drive. **07**
- OR**
- Q.4** (a) Draw the 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) Explain variable-frequency operation of Induction Motor. Also draw torque characteristics for this motor at constant volts / Hz. **07**
- Q.5** (a) Discuss on sensitivity of vector-controlled Induction Motor **03**
(b) Discuss on compensation of vector-controlled Induction Motor **04**
(c) Explain the concept of direct vector control of Induction Motor Drive. **07**
- OR**
- Q.5** (a) Brief the idea about speed control of synchronous motor by vector control method. **03**
(b) Discuss dynamic d-q model of Induction Motor. **04**
(c) Discuss Principle of indirect vector control with necessary diagram. **07**
