

GUJARAT TECHNOLOGICAL UNIVERSITY
M.E. 2nd SEMESTER EXAMINATION – WINTER 2014

Subject Code:1724501**Date:02/12/2014****Subject Name: Solid State AC Drives****Time:02:00 p.m. to 05:00 p.m.****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 the field oriented control method for induction motor. **07**
(b) Make comparison between Current Source Inverter (CSI) and Voltage Source Inverter (VSI) drives. Why stator voltage control is suitable for speed control of Induction Motors in Fan and Pump drives? **07**
- Q.2** (a) Explain vector control of current-fed inverter of induction motor. **07**
(b) Explain slip power recovery method for induction motor. **07**
- OR**
- (b) Explain how a voltage source inverter fed induction motor is operated in dynamic braking. **07**
- Q.3** (a) Explain indirect vector control of induction motor with slip and flux estimation from machine parameters. **07**
(b) What is the difference between scalar control and vector control of induction motor drives? Explain merit and demerits of it. **07**
- OR**
- Q.3** (a) Explain open loop V/f control of voltage source inverter fed for induction motor. What is \pm voltage boosting in a voltage-source inverter, and why is it necessary? **07**
(b) Explain principle of vector control of induction motor drives with the help of block diagram. **07**
- Q.4** (a) Explain power factor control of synchronous motor with changing excitation for constant load torque. **07**
(b) Variable frequency control of Induction Motor is more efficient than stator voltage control, Why? **07**
- OR**
- Q.4** (a) What is the principle of Direct torque control of induction motor drives? How it is differ from field control? **07**
(b) What is the difference between self-controlled and true synchronous mode of variable frequency control of synchronous motor? Why self-controlled motor is free from hunting? **07**
- Q.5** (a) Write a brief note on Static Kramer Drive. **07**
(b) Explain Brush and Brushless d.c. excitation for wound field synchronous machine. **07**
- OR**
- Q.5** (a) How the flux vector estimation is to be done for indirect vector control method? **07**
(b) What is Direct torque control of Induction motor? Explain how it is useful for fast torque response. **07**
