

GUJARAT TECHNOLOGICAL UNIVERSITY**M. E. - SEMESTER – II • EXAMINATION – SUMMER • 2014****Subject code: 1724501****Date: 16-06-2014****Subject Name: Solid State A. C. Drives****Time: 02:30 pm - 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) Explain Constant Volt/Hz operation of induction motor using different induction motor characteristics. **07**

(b) Explain stationary frame a-b-c to ds-qs transformation of induction motor model? What is the necessity of it? **07**

Q.2 (a) Explain slip power recovery method for induction motor. **07**

(b) What is the difference between scalar control and vector control of induction motor drives? Explain merit and demerits of it. **07**

OR

(b) Explain speed control of induction motor with closed loop torque and flux control for v/f control with help of block diagram. **07**

Q.3 (a) Explain principle of vector control of induction motor drives with the help of block diagram. **07**

(b) Explain how flux vector estimation is to be done for direct vector control of IM drives. **07**

OR

Q.3 (a) Explain Indirect vector control of induction motor drives with help of block diagram for open loop flux control. **07**

(b) What is the principle of Direct torque control of induction motor drives? How it is differ from field control? **07**

Q.4 (a) Explain control strategy for DTC drives with help of block diagram. **07**

(b) Explain how the sectors are identified for switching of inverter switch in DTC. **07**

OR

Q.4 (a) What is the difference between direct vector control method and indirect vector control method of induction motor **07**

(b) Explain D.C drive analogy of induction motor with the help of vector diagram and block diagram. **07**

Q.5 (a) How the flux vector estimation is to be done for indirect vector control method? **07**

(b) Explain principle of sensorless vector control method for IM ? List out the different method of speed estimation. Explain one of the methods. **07**

OR

Q.5 (a) Explain Brush and Brushless d.c. excitation for wound field synchronous machine. **07**

(b) Explain load commutated current fed Inverter for wound field synchronous motor. **07**
