

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII • EXAMINATION – WINTER • 2014****Subject Code: 172402****Date: 02-12-2014****Subject Name: Industrial Drives and Control-II****Time: 10:30 am - 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) Draw the Block Diagram of Power Electronics Motor Drive and Explain functionality and working of each block in detail. **07**

(b) Explain torque/speed characteristic of 3-Phase induction motor. **07**

Q.2 (a) Discuss IM's behavior for non-sinusoidal source voltages. **07**

(b) Discuss stator voltage control method for **07**
(i) Constant load –torque
(ii) Fan type loads.

OR

(b) Explain the principle behind the variation of the speed of a 3- Φ IM by v/f method. Discuss this for the following two different modes: **07**
1. Operation below rated frequency
2. Operation above rated frequency.

Q.3 (a) “Variable frequency operation is possible with synchronous motor” .Justify the statement. **07**

(b) Explain concept of Slip power. Discuss it with Basic Kramer Drive. **07**

OR

Q.3 (a) Explain the operation of a synchronous motor fed from an adjustable frequency current source with circuit diagram and characteristics curve. **07**

(b) With the help of suitable diagrams discuss Scherbius drive. **07**

Q.4 (a) Write a short note: Dynamic d-q model of Induction Motor. **07**

(b) Discuss Principle of vector control with necessary diagram. **07**

OR

Q.4 (a) Explain the difference between Rotor and Stator Reference Frame. **03**

(b) Explain difference between scalar voltage control and vector voltage control. **07**

Q.5 (a) Explain the concept of sensor less control of induction motor. **07**

(b) Enlist various control methods for speed control of SRM. Discuss any one in brief. **07**

OR

Q.5 (a) With the help of suitable diagram, explain self-controlled synchronous motor drive using load commutated thyristor inverter.” **07**

(b) Describe permanent magnet AC motor drive. **07**
