

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- VIIth SEMESTER-EXAMINATION – MAY/JUNE- 2012****Subject code: 172402****Date: 08/06/2012****Subject Name: Industrial Drives & Control -II****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.
4. Notations/ symbols used have usual meanings.

Q.1 (a) Draw the speed torque characteristics of A.C. induction motor for variable speed drive application. **07**

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

Q.2 (a) Explain how the speed and torque of induction motor can be varied by rotor voltage control. **07**

(b) Explain with diagram slip power recovery scheme. **07**

OR

(b) Discuss stator voltage control method for **07**

(i) Constant load –torque and (ii) Fan type loads.

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

(b) Explain the concept of dynamic modeling of 3-Ø induction motor. **07**

OR

Q.3 (a) Explain self-controlled synchronous motor drive. **07**

(b) Derive the steady-state equivalent circuit from the dynamic equation of the IM. **07**

Q.4 (a) With the help of block diagram representation, explain an indirect vector-controlled induction motor drive. **07**

(b) A three phase, 460V, 60 Hz, eight-pole, Y-connected induction motor has $R_s = 0.08\Omega$, $R_r' = 0.1\Omega$, $X_s = 0.62\Omega$, $X_r' = 0.92\Omega$ and $R_m = 6.7\Omega$. The no-load loss = 300 W. At a motor speed of 850 rpm. Draw (i) Approximate equivalent circuit. **07**

(ii) the synchronous speed and (iii) the slip.

OR

Q.4 (a) Discuss PWM inverter drive. **07**

(b) Discuss parameter sensitivity in vector control for IM. **07**

Q.5 (a) Discuss converter circuit for SRM. **07**

(b) Explain basic principle of DTFC. **07**

OR

Q.5 (a) Describe control of SRM drive in detail. **07**

(b) Enlist various methods of closed loop control for IM. Discuss any one in detail. **07**
