Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–VII • EXAMINATION – SUMMER • 2014**

**Subject Code: 172402** **Date: 03-06-2014**

**Subject Name: Industrial Drives and 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 used have usual meaning.**

| | | | |
|---|---|---|---|
| **Q.1** | **(a)** | Explain stator voltage control method for speed control of induction motor. Explain for what kind of an application it is used? | **07** |
| | **(b)** | Why starter is necessary for induction motor? Discuss auto transformer starter for induction motor. | **07** |
| **Q.2** | **(a)** | Discuss the working operation of induction motor with unbalanced source voltage. | **07** |
| | **(b)** | A 4 pole wound-rotor induction motor is used as a frequency changer. The starter is connected to a 50 Hz, 3 phase supply. The load is connected to the rotor slip rings. What are the possible speeds at which the rotor can supply power to this load at 25 Hz? What would be the ratio of voltages at load terminals at these speeds? Assume rotor impedance to be negligible. | **07** |
| | | **OR** | |
| | **(b)** | Write a short note on dynamic braking of induction motor. | **07** |
| **Q.3** | **(a)** | Explain V/F control of induction motor with its characteristics. Where this type of control is used? | **07** |
| | **(b)** | Discuss dynamic d-q modeling of induction machines. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Explain operation of Closed Loop control of Static Scherbius Drive. | **07** |
| | **(b)** | Describe speed control of synchronous motor. | **07** |
| **Q.4** | **(a)** | Explain basic principle of direct torque control of induction motor. | **07** |
| | **(b)** | Write a brief note on PWM inverter drive. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Explain the difference between Rotor and Stator Reference Frame. | **07** |
| | **(b)** | Discuss direct rotor flux oriented vector control of induction motor. | **07** |
| **Q.5** | **(a)** | Explain speed control of slip ring induction motor with rotor resistance control using chopper circuit. | **07** |
| | **(b)** | Discuss the parameter sensitivity of vector controlled induction motor. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Write a technical note on permanent AC motor drives. | **07** |
| | **(b)** | Discuss the effects of harmonics on induction motor operation. | **07** |

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