**Seat No.: _____** **Enrolment No._____**

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–VI (NEW) - EXAMINATION – SUMMER 2016**

**Subject Code:2160910** **Date:17/05/2016**

**Subject Name: Electrical Drives**

**Time: 10:30 AM to 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)** | What are the operating modes of three phase full converter with inductive load and explain any one. | **07** |
| | **(b)** | Explain how to obtained a variable average output voltage from a fixed dc voltage with the help of chopper. | **07** |
| **Q.2** | **(a)** | Draw the basic block diagram of electric drives and explain function of each block. | **07** |
| | **(b)** | Explain the four quadrant diagram of speed torque characteristic using hoist load. | **07** |
| | | **OR** | |
| | **(b)** | Explain the nature and classification of load torques. | **07** |
| **Q.3** | **(a)** | Explain the dynamic model of dc motor drive. | **07** |
| | **(b)** | A 200V dc series motor runs at 800rpm when operating at its full load current of 10A. the motor resistance is 0.5Ω and magnetic circuit can be assumed unsaturated, what will be the speed if (a) the load torque is increase by 50% (b) the motor current is 5A. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Explain the different types of speed control methods for dc shunt motor. | **07** |
| | **(b)** | A 200V dc series motor has armature and field resistance of 0.2Ω and 0.1Ω respectively. It takes a current of 20A from the supply while running at 1300rpm. If an external resistance of 2Ω is added in series with the motor calculate new armature current and the speed. Assume load torque is remains constant. | **07** |
| **Q.4** | **(a)** | Explain the constant flux speed control using voltage source inverter. | **07** |
| | **(b)** | State the advantages and applications of synchronous motor drives. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Explain the principle of vector control model for ac induction motor drives. | **07** |
| | **(b)** | Draw the basic block diagram of commutator less dc shunt motor and explain function of each block. | **07** |
| **Q.5** | **(a)** | State the advantages and disadvantages of electric traction drives. | **07** |
| | **(b)** | Explain the unipolar and bipolar PWM bridge inverter with necessary waveforms and circuit diagram. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Explain the basic structure of solar drives. | **07** |
| | **(b)** | Explain the servo motor drive requirement, control and implementation. | **07** |

**********