Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–VI (NEW) EXAMINATION – WINTER 2018**

**Subject Code:2162003** **Date:16/11/2018**

**Subject Name:Control of Electric Drives**

**Time: 02:30 PM TO 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.**

| | | | MARKS |
|---|---|---|---|
| **Q.1** | **(a)** | State the advantages and disadvantages of electric drives. | **03** |
| | **(b)** | Give classification of load torque with their characteristics. | **04** |
| | **(c)** | Explain the four quadrant operation of electrical drive with example. | **07** |
| **Q.2** | **(a)** | Explain how to determine the moment of inertia of drive system. | **03** |
| | **(b)** | Draw and explain basic block diagram of electric drives. | **04** |
| | **(c)** | Derive the mathematical model of separately excited DC machine. | **07** |
| | | **OR** | |
| | **(c)** | Draw and explain the Dynamic V-I characteristics of SCR in detail. | **07** |
| **Q.3** | **(a)** | Define the terms: (1) latching current (2) holding current (3) circuit turn-off time. | **03** |
| | **(b)** | Explain design of snubber circuit. | **04** |
| | **(c)** | Explain in brief various control strategies of a chopper. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Give the classification of Choppers. | **03** |
| | **(b)** | Draw the circuit diagram of 1-phase half wave controlled rectifier. Also draw the waveform of output voltage with R-load with $\alpha = 60^0$ | **04** |
| | **(c)** | Explain A.C. phase control of TRIAC using DIAC. | **07** |
| **Q.4** | **(a)** | Explain the field control method for DC motor. | **03** |
| | **(b)** | Enlist methods of braking in AC motors and explain any one in detail. | **04** |
| | **(c)** | Explain the speed control method of 3-phase induction motor. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Explain the armature control method for DC motor. | **03** |
| | **(b)** | Explain with necessary diagram 3-point starter using in dc motor. | **04** |
| | **(c)** | Give the comparison between various methods of braking in dc motors. | **07** |
| **Q.5** | **(a)** | Explain any one speed control method of 3-phase induction motor in detail. | **03** |
| | **(b)** | Explain chopper controlled DC motor drive operation for various modes. | **04** |
| | **(c)** | Explain various PWM techniques for single phase inverter and three phase inverter. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Enlist methods of braking in DC motors. | **03** |
| | **(b)** | Explain in detail: Ideal dual converters. | **04** |
| | **(c)** | Explain the construction and control of variable reluctance steeper motor in detail. | **07** |

**********