

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – WINTER 2018****Subject Code:2160910****Date:04/12/2018****Subject Name:Electrical 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.

- Q.1** (a) Give advantages of PWM inverter. **03**
(b) What is meant by steady state stability of an electrical drive? Explain and state the two conditions for an electrical drive to have steady state stability from explanations **04**
(c) Explain the Dynamic model of DC motor Drive. **07**
- Q.2** (a) Explain any one speed control method of 3-Phase Induction motor. **03**
(b) Explain Synchronous motor drive with block diagram in brief. **04**
(c) Explain single phase full wave bridge type controlled converter with RLE load and with freewheeling diode. Also draw all the necessary waveforms and derive equations of output DC voltage and current. **07**
- OR**
- (c) Explain the four quadrant operation of chopper (type-E) **07**
- Q.3** (a) Give classification of AC to DC Converters. **03**
(b) What are the factors affecting the selection of electrical drives. **04**
(c) Explain d-q model of Induction motor **07**
- OR**
- Q.3** (a) Explain type A chopper circuit. **03**
(b) Draw block diagram of electric drive and give function of each block. **04**
(c) Explain the principle of vector control model for induction motor drives. **07**
- Q.4** (a) What is self tuning control? Explain **03**
(b) What is sliding mode control? State its advantages. **04**
(c) Explain the torque equation for D.C motor. **07**
- OR**
- Q.4** (a) Draw torque-speed characteristics of different DC motors. **03**
(b) Explain the field control and armature control methods of speed control for DC shunt motor. **04**
(c) Explain model referencing adaptive control. **07**
- Q.5** (a) State the advantages of three phase rectifier over single phase rectifier for drive system. **03**
(b) What is load equalization? Why is it required? **04**
(c) Explain basic structure of solar and battery powered drives. **07**

OR

- Q.5**
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| (a) | State the advantages of electric traction drive. | 03 |
| (b) | Derive fundamental torque equation. | 04 |
| (c) | Explain the servo motor drive requirement, control and implementation. | 07 |

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