

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- VIth SEMESTER-EXAMINATION – MAY- 2012****Subject code: 162003****Date: 15/05/2012****Subject Name: Control of Electric Drives****Time: 10:30 am – 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) List and explain different parts of electric drive. **07**
(b) What are the different components of torque of rotating load? Explain all of them in detail. **07**

- Q.2** (a) Explain all the three modes of operation of electric drive. **07**
(b) Write a short note on moment of inertia and also derive equation of moment of inertia for rotary load. **07**

OR

- (b) Explain in detail: start of a motor with shunt type characteristic at no load. **07**

- Q.3** (a) Explain armature control in DC motor. **07**
(b) Draw speed-torque curves of different types of DC motors in a single plot and explain the same. **07**

OR

- Q.3** (a) Explain field control in DC motor. **07**
(b) Write a note on starting of DC motor by sequentially short circuiting starting resistors. **07**

- Q.4** (a) 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**
(b) Explain generalized four quadrant chopper. **07**

OR

- Q.4** (a) Explain three phase full wave controlled converter with R load and firing angle for SCRs is 0° . Also draw all necessary waveforms and derive the equation of output DC voltage and current. **07**
(b) Explain voltage commutated chopper with necessary waveforms. **07**

- Q.5** (a) A 200 V, 875 rpm, 150A separately excited dc motor has an armature resistance of 0.06Ω . It is fed from a single phase fully controlled rectifier with an ac source voltage of 220V, 50Hz. Assuming continuous conduction, calculate **07**
(i) Firing angle for rated motor torque and 750 rpm.
(ii) Motor speed for firing angle of 160° for the thyristor and for rated torque.

- (b) Explain the construction of single stack variable reluctance stepper motor. **07**

OR

- Q.5** (a) List all the starting methods of single phase induction motor and explain any one of them in detail. **07**
(b) Explain dynamic braking of separately excited DC motor using chopper control. **07**
