

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE SEM-III Examination-Dec.-2011

Subject code: 133402

Date: 15/12/2011

Subject Name: Electrical Drives and Control

Time: 2.30 pm -5.00 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 is an electrical drive? Draw the block diagram of electrical drives and explain it. Also discuss its advantages? **07**
- (b) State and explain the function of various converters? **07**

- Q.2** (a) What are the different electrical braking methods used in electrical drives. Explain the method applied to dc motor? **07**
- (b) Discuss in details the speed torque characteristics of DC shunt and series motor? **07**

OR

- (b) A 4-pole, 240 V, wave connected shunt motor gives 1119 kW when running at 1000 rpm and drawing armature and field currents of 50 A and 1.0 A respectively. It has 540 conductors. Its resistance is 0.1 ohms. Assuming a drop of 1 V per brush, find (1) total torque (2) useful torque (3) useful flux/pole (4) rotational losses and (5) efficiency **07**
- Q.3** (a) What are the needs of starter? Explain the 3-point starter with neat diagram? **07**
- (b) Explain the starting method of squirrel cage induction motor? **07**

OR

- Q.3** (a) Explain the starting method of slip ring induction motor? **07**
- (b) With a neat sketch, explain the four point dc starter? **07**

- Q.4** (a) Explain the single phase half-controlled rectifier control of DC separately excited motor? **07**
- (b) A 200 V, 10.5 A, 2000 rpm shunt motor has the armature and field resistances of 0.5 and 400 ohms respectively. It drives a load whose torque is constant at rated motor torque. Calculate motor speed if source voltage drops to 175 V. **07**

OR

- Q. 4** (a) Explain the chopper control of separately excited DC motor? **07**
- (b) Describe the Ward-Leonard speed control method? **07**

- Q.5** (a) Explain the method of control of three phase induction motor by (1) stator voltage control (2) frequency control **07**
- (b) Explain the different starting method of three phase induction motor? **07**

OR

- Q.5** (a) Explain the different slip power recovery system? **07**
- (b) Explain the solid state speed control of A.C. drives using inverters? **07**
