

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE SEM-V Examination-Nov/Dec.-2011

Subject code: 150906

Date: 03/12/2011

Subject Name: Electrical Power Utilization and Traction

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) State speed control methods of DC Shunt motor and explain armature voltage control with suitable diagram. **07**
- (b) State the methods of speed control of three phase induction motor and explain any one method in detail. **07**

- Q.2** (a) A 240volt d.c. shunt motor has a field resistance of 400 Ω and armature resistance of 0.1 Ω . The armature current is 50 Amp and speed is 900 rpm. Calculate additional resistance required in the field to increase the speed to 1000 rpm for the same armature current. Assume a straight line magnetization curve. **07**
- (b) Explain regenerative braking of DC motor. **07**

OR

- (b) Suggest suitable A.C. and D.C. drives for following applications. Give reasons for the same. **07**
1. Pump 2. Blower 3. Hoist 4. Excavator

- Q.3** (a) Explain design procedure of heating element with necessary expressions. **07**
- (b) A 30 KW , 400 volts resistance oven is to employ nickel chrome strip 0.254 mm thick for 3 delta connected heating elements. If wire temperature is 1100° C and that of charge is 700° C. Estimate suitable width for the strip. Assume emissivity (ϵ) = 0.9, radiating efficiency (η) = 0.5 **07**

OR

- Q.3** (a) Explain power supply for electrolysis processes. **07**
- (b) State and explain square law of illumination. **07**
- Q.4** (a) Explain fluorescent lamp with diagram. **07**
- (b) Explain street lighting. **07**

OR

- Q.4** (a) Explain clearly speed time curves for urban and sub-urban services. **07**

- (b) A train runs with an average speed of 40 kmph . Distance between stations is 2 km, values of acceleration and retardation are 1.5 kmph and 2.5 kmph respectively. Find the maximum speed of train assuming trapezoidal speed time curve. **07**

Q.5 (a) Explain principle and working of a indirect core type furnace. **07**

(b) Explain braking of traction motors in brief. **07**

OR

Q.5 (a) Explain different types of resistance welding. **07**

(b) Explain temperature rise of electrical drives with necessary expression. **07**
