

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-III • EXAMINATION – WINTER • 2014

Subject Code: 131901**Date: 20-12-2014****Subject Name: Electrical Machines and Electronics****Time: 02.30 pm - 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) Explain constructional details of D.C. generator. Also give the classification with neat diagrams. **07**
- (b) A 25 KVA transformer has 500 turns on the primary and 50 turns on the secondary winding. The primary is connected to 3000 V, 50 Hz supply. Find the full load primary and secondary currents, the secondary e.m.f. and the maximum flux in the core. Neglect leakage drops and no load primary current. **07**
- Q.2** (a) Explain the construction features and working principle of single phase transformer. **07**
- (b) Why starters are used in DC shunt motors? Explain 3-point starter with neat diagram. **07**
- OR**
- (b) A 4 pole, d.c. shunt generator with a shunt field resistance of 100 ohm and an armature resistance of 1 ohm has 378 wave connected conductors in its armature. The flux per pole is 0.02 wb. If a load resistance of 10 ohm is connected across the armature terminals and the generator is driven at 1000 r.p.m. Calculate the power absorbed by the load. **07**
- Q.3** (a) State various methods for power factor improvement. Explain any one method. **07**
- (b) Compare overhead system and underground system for electric supply. **07**
- OR**
- Q.3** (a) Draw the typical layout of substation. Also state the function of equipment used in substation. **07**
- (b) Compare A.C. and D.C. transmission system in details. **07**
- Q.4** (a) Describe working principle of shaded pole type single phase induction motor with neat diagram. **07**
- (b) Explain the difference between core type and shell type transformer. Also give the comparison for power transformer and distribution transformer. **07**
- OR**
- Q.4** (a) Explain the use of C.T. and P.T. for voltage, current and power measurement. **07**
- (b) What are the conditions to be fulfilled for parallel operation of two synchronous machine? Explain any one method of synchronizing. **07**
- Q.5** (a) What is Logic-Gate? Draw the Truth table & symbol for NAND, NOT, OR Gate. Also State & Explain De-Morgan's Theorem. **07**
- (b) What is a tariff? Explain the types of tariff. **07**
- OR**
- Q.5** (a) Explain half wave rectifier and full wave rectifier. **07**
- (b) Define following Terms: **07**
- (i) Demand Factor (ii) Load Factor (iii) Diversity Factor (iv) Connected Load (v) Plant capacity Factor (vi) Maximum Demand (vii) Average Load
