Seat No.: _____   Enrolment No._____

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

Subject Code: 131901   **Date: 30-05-2014**

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 the construction and working principle of D.C.generator. **07**

(b) Why starters are used in D.C. shunt motors? Explain 3 point starter with neat diagram. **07**

Q.2 **(a)** Draw and explain the torque slip characteristics of a three phase induction motor. **07**

(b) Explain shaded pole induction motor in detail. **07**

OR

(b) A d.c. series generator drives a load of 60 Amp. The armature and field resistances are 0.02ohm and 0.03 ohm respectively. The armature consists of 4 turns per coil with 600 such coils. Speed of the series generator is 1200 RPM. If the generator has 4 poles, lap wound armature, flux per pole is 3mWb, and voltage drop per brush to be 2 volt, then calculate the load voltage. **07**

Q.3 **(a)** What is voltage regulation of an alternator? Explain synchronous impedance method. **07**

(b) A 3 phase, 12 pole, 50 Hz alternator has nine slots/pole. Determine distribution factor and coil span factor for a two layer winding, the coils being shorted by two slots. What changes are expected in the values of the two factors if the armature single is a single layer winding? **07**

OR

Q.3 **(a)** Explain the working principle and construction and types of a single phase transformer. **07**

(b) Explain the advantages of high transmission voltage. **07**

Q.4 **(a)** What is a tariff? Explain the types of tariff. **07**

(b) What is the purpose of substation in electrical power system? Explain briefly the function of equipments used in substation. **07**

OR

Q.4 **(a)** What is an Op-Amp? State various applications of Op-Amp. Also explain the terms CMRR, PSRR, and slew rate for practical Op-amp. **07**

(b) Explain the full wave rectifier in detail with the help of circuit diagram and waveforms. **07**

Q.5 **(a)** Explain De-Morgan's theorem. **07**

(b) Why are NAND and NOR gates called universal gates? **07**

OR

Q.5 **(a)** Explain the features of 8085 microprocessor. **07**

(b) Explain various methods used for power factor improvement. **07**

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