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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