GUJARAT TECHNOLOGICAL UNIVERSITY
B. E. - SEMESTER – IV • EXAMINATION – WINTER 2012

Subject code: 142401   **Date: 27/12/2012**
Subject Name: Electro Mechanical Energy Conversion-1
Time: 02.30 pm - 05.00 pm   **Total Marks: 70**
Instructions:
1. **Attempt any five questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Notations used have usual meaning.**

Q.1	**(a)**	Explain the no load characteristics of self excited DC generator.	**07**
	(b)	Explain different losses occur in dc generator.	**07**
Q.2	**(a)**	Explain the characteristics of separately excited DC motor.	**07**
	(b)	A shunt generator has a full load current of 196 A at 220V. The stray (magnetic and mechanical) losses are 720W and the shunt field coil resistance is 55 ohms. If it has a full load efficiency of 88%, find the armature resistance. Also, find the load current corresponding to maximum efficiency.	**07**

OR

	(b)	A 220 V dc series motor is running at a speed of 800 rpm and draws 100 A current. Calculate at what speed the motor will run when developing half the torque. The total resistance of the armature and field is 0.1 ohm. Assume that the magnetic circuit is unsaturated.	**07**
Q.3	**(a)**	Explain Four point starter for DC motor with neat diagram.	**07**
	(b)	Discuss operation of single phase transformer at no load and on load.	**07**

OR

Q.3	**(a)**	Discuss speed control methods for controlling speed of DC motor.	**07**
	(b)	Explain the construction and working principle of three phase induction motor.	**07**
Q.4	**(a)**	Explain regulation and efficiency of single phase transformer.	**07**
	(b)	A 100 kVA, 6600/330V, 50 Hz, single phase transformer took 10 A and 436 W, at 100 V in short circuit test, the figures referring to the high voltage side. Calculate the voltage to be applied to the high voltage side on full load at a power factor of 0.8 lagging when the secondary terminal voltage is 330V.	**07**

OR

Q.4	**(a)**	Discuss the conditions for parallel operation of synchronous generator.	**07**
	(b)	Explain all day efficiency in the case of transformer.	**07**
Q.5	**(a)**	Write a short note on stepper motor.	**07**
	(b)	Explain working principle of Schrage motor.	**07**

OR

Q.5	**(a)**	Derive the equation for induced emf in an alternator.	**07**
	(b)	Explain auto transformer in detail.	**07**

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