Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- IVth SEMESTER–EXAMINATION – MAY/JUNE- 2012

Subject code: 142401 **Date: 23/05/2012**

Subject Name: Electro Mechanical Energy Conversion-I

Time: 10:30 am – 01:00 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 the working principle of dc generator. Explain different parts of dc generator with neat sketches.	**07**
	(b)	Explain no load saturation curve, load saturation curve, external and internal characteristics of separately excited dc generators.	**07**
Q.2	**(a)**	List the method of speed control of dc shunt motor. Explain field control and armature control methods in detail.	**07**
	(b)	Explain the necessity of starter. Explain 3-point starter with neat diagram.	**07**
		OR	
	(b)	Explain different losses occurring in dc machines.	**07**
Q.3	**(a)**	Explain the theory of production of rotating field with 3-Φ supply voltage.	**07**
	(b)	Define slip. Explain the stroboscopic method of measurement of slip in detail.	**07**
		OR	
Q.3	**(a)**	Explain auto transformer starter of 3-Φ induction motor with neat diagram.	**07**
	(b)	Derive the equation for starting torque of 3-Φ induction motor. Describe the condition for maximum starting torque. Explain the effect of change in supply voltage on starting torque.	**07**
Q.4	**(a)**	Explain the working of ideal 1-Φ transformer with loaded secondary. Draw neat vector diagrams.	**07**
	(b)	Draw and explain the equivalent circuit of 1-Φ transformer.	**07**
		OR	
Q.4	**(a)**	Explain auto-transformer in detail. List the applications of auto-transformer.	**07**
	(b)	Explain the regulation of 1-Φ transformer in detail with necessary diagrams.	**07**
Q.5	**(a)**	Define pitch factor and distribution factor. Derive E.M.F. equation of 3-Φ alternator.	**07**
	(b)	Explain construction, working and speed control of Schrage motor.	**07**
Q.5	**(a)**	Explain the zero power factor method of finding the regulation of 3-Φ alternator in detail with neat diagrams.	**07**
	(b)	Explain the working principle of repulsion inductor motor with neat diagrams.	**07**

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