Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V • EXAMINATION – SUMMER • 2014

Subject Code: 152001 **Date: 11-06-2014**

Subject Name: Electro Mechanical Energy Conversion

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)**	List out and explain the properties of a magnetic material.	**07**
	(b)	Write a short note on types of Magnetic materials.	**07**
Q.2	**(a)**	State and explain Ampere's and Biot-Savart's law.	**07**
	(b)	For an attracted armature relay excited by an electric source, explain mechanical energy.	**07**
		OR	
	(b)	Explain AC operation of magnetic circuits.	**07**
Q.3	**(a)**	Derive the expression for power loss in ferromagnetic structure due to eddy current effects.	**07**
	(b)	Derive the expression for magnetic field due to current in straight wire.	**07**
		OR	
Q.3	**(a)**	Explain energy balance in non-linear magnetic systems excited by a single source with suitable graphs and expressions.	**07**
	(b)	Explain energy stored in capacitor and energy density in electric field with suitable expressions.	**07**
Q.4	**(a)**	Why single phase induction motor is not self starting? Also Explain methods of starting single phase Induction motor.	**07**
	(b)	Explain construction of an induction motor.	**07**
		OR	
Q.4	**(a)**	Explain construction & working of an elementary generator.	**07**
	(b)	Explain generalized machine and also give energy conversion in matrices equations.	**07**
Q.5	**(a)**	Derive the expression for emf generated in practical DC machines.	**07**
	(b)	Explain rotating magnetic field in 2-phase and 3-phase induction machine.	**07**
		OR	
Q.5	**(a)**	Explain reluctance motor.	**07**
	(b)	Explain hysteresis motor.	**07**

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