Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (OLD) - EXAMINATION – SUMMER 2017

Subject Code: 142401 **Date: 01/06/2017**

Subject Name: Electro Mechanical Energy Conversion-1

Time: 10:30 AM to 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)**	Explain the zero power factor method for determining the voltage regulation of a three phase alternator.	**07**
	(b)	Define slip. Explain the relation between torque and slip. Explain the effect of change in supply voltage on torque and speed in three-phase induction motor.	**07**
Q.2	**(a)**	Explain the working principle of single-phase repulsion motor with necessary diagram.	**07**
	(b)	Explain the characteristics of separately excited dc generator.	**07**
		OR	
	(b)	Explain construction and working of Schrage Motor.	**07**
Q.3	**(a)**	Explain the iron losses of dc machine.	**07**
	(b)	Explain the losses occur in a transformer. Derive the condition for maximum efficiency.	**07**
		OR	
Q.3	**(a)**	Explain the external and internal characteristics of dc shunt generator.	**07**
	(b)	Discuss operation of single phase transformer at no load and on load.	**07**
Q.4	**(a)**	Explain the theory of an auto transformer.	**07**
	(b)	Explain the equivalent circuit of single-phase transformer.	**07**
		OR	
Q.4	**(a)**	Why starter is necessary in DC Motor? Explain the working of three point starter with neat diagram.	**07**
	(b)	Explain the torque-speed characteristics of 3-Φ IM. Explain the effect of change in supply frequency and voltage on torque and speed.	**07**
Q.5	**(a)**	Explain the repulsion principle with the help of neat diagram.	**07**
	(b)	Define voltage regulation of an alternator. Explain the synchronous impedance method for determining the regulation of an alternator.	**07**
		OR	
Q.5	**(a)**	Define Distribution factor and Pitch factor. Derive the emf equation of an alternator.	**07**
	(b)	Write a short note on stepper motor.	**07**

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