Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (New) EXAMINATION – WINTER 2015

Subject Code:2140906 **Date:28/12/2015**

Subject Name: AC Machines

Time: 2:30pm to 5:00pm **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)**	Derive the equation of electromagnetic torque for a three phase induction motor with usual notations from first principles.	**07**
	(b)	Describe the effect of armature reaction in case of a synchronous generator.	**07**
Q.2	**(a)**	Draw the phasor diagram (vector diagram) for a three phase induction motor and justify the statement 'Power factor of the motor improves from no load to full load'.	**07**
	(b)	Derive the emf equation of an alternator. Just define the pitch factor and distribution factor.	**07**
		OR	
	(b)	Explain the construction of a salient pole synchronous machine.	**07**
Q.3	**(a)**	Discuss the procedure to perform no load and blocked rotor tests on a three phase induction motor.	**07**
	(b)	Mention the types of starters for a three phase induction motor. Explain DOL starter in detail.	**07**
		OR	
Q.3	**(a)**	Explain the procedure to construct the circle diagram of induction motor. Also describe the method to determine losses, efficiency and slip at full load condition using circle diagram.	**07**
	(b)	Briefly explain the double field revolving theory in relation to single phase AC motors.	**07**
Q.4	**(a)**	List the methods of determination of voltage regulation of an alternator. Describe any one of them in detail.	**07**
	(b)	Write a short note on auto synchronous motor.	**07**
		OR	
Q.4	**(a)**	Explain with reason why synchronous motor is not self starting. Discuss the methods of starting the synchronous motor.	**07**
	(b)	What is synchronization? Explain two bright one dark lamp method of synchronization.	**07**
Q.5	**(a)**	Draw the schematic diagram and explain the principle of induction generator.	**07**
	(b)	Explain the construction and working of universal motor.	**07**
		OR	
Q.5	**(a)**	Briefly describe the construction and working of linear induction motor.	**07**
	(b)	Mention the types of single phase AC motors. Explain the construction and working of shaded pole single phase motor.	**07**

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