Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–IV (NEW) EXAMINATION – WINTER 2020

Subject Code:2140906 Date:15/02/2021

Subject Name:AC Machines

Time:02:30 PM TO 04:30 PM Total Marks:56

Instructions:

1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			MARKS
Q.1	**(a)**	Explain two bright one dark lamp method of synchronization.	**03**
	(b)	What do you mean by auto synchronous motor?	**04**
	(c)	Explain the phenomena of crawling and cogging in induction motor	**07**
Q.2	**(a)**	Describe the effect of armature reaction with zero lagging power factor in case of a synchronous generator	**03**
	(b)	Derive the equation of electromagnetic torque for a three phase induction motor with usual notations from first principles.	**04**
	(c)	Drive the expression for electromagnetic torque for three phase induction motor with usual notations from first principals	**07**
Q.3	**(a)**	Define the voltage regulation of alternator	**03**
	(b)	Explain the construction of a salient pole synchronous machine.	**04**
	(c)	Explain the parallel operation of two alternators.	**07**
Q.4	**(a)**	Define pitch factor and distribution factor of alternator	**03**
	(b)	Drive the emf equation of alternator	**04**
	(c)	List the methods of determination of voltage regulation of an alternator. Describe any one of them in detail.	**07**
Q.5	**(a)**	What is harmonic torque	**03**
	(b)	Discuss the procedure to perform no load and blocked rotor tests on a three phase induction motor.	**04**
	(c)	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**
Q.6	**(a)**	What is synchronization	**03**
	(b)	Briefly explain V-curves of synchronous motor.	**04**
	(c)	Explain with reason why synchronous motor is not self-starting. Discuss the methods of starting the synchronous motor.	**07**
Q.7	**(a)**	Draw the schematic diagram and explain the principle of induction generator	**03**
	(b)	Explain the construction and working of universal motor.	**04**
	(c)	Why single phase motor is not self-starting? explain the double field revolving theory in relation to single phase AC motors	**07**
Q.8	**(a)**	Briefly describe the construction and working of linear induction motor.	**03**
	(b)	Explain hunting in synchronous machine	**04**
	(c)	Draw the schematic diagram and explain the construction and working of shaded pole single phase motor.	**07**

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