Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) EXAMINATION – WINTER 2023

Subject Code:3150910 Date:07-12-2023

Subject Name:Electrical Machine- II

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.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Explain term hunting for synchronous motor, also explain method to reduce this effect.	**03**
	(b)	Explain working principle of induction motor. Give detail classification of induction motors, and its advantages and disadvantages.	**04**
	(c)	Explain frequency of rotor current in induction motor. Derive torque equations for starting and running condition of induction motor.	**07**
Q.2	**(a)**	Explain power stages of an induction motor in detail.	**03**
	(b)	Draw and explain relation between torque and slip of induction motor.	**04**
	(c)	Which tests required to draw circle diagram for induction motor? Explain steps to draw the circle diagram of an induction motor in detail.	**07**
		OR	
	(c)	Explain necessity of starters in three induction motor also draw and explain star-delta starter in detail.	**07**
Q.3	**(a)**	Explain cogging and crawling.	**03**
	(b)	Draw and explain circuit diagram and vector diagram of an induction motor.	**04**
	(c)	Why does rotor rotates in three phase induction motor? Explain in detail production of Rotating Magnetic Field.	**07**
		OR	
Q.3	**(a)**	Write methods of speed control of universal motor.	**03**
	(b)	What is the use of centrifugal switch in single phase induction motor? Explain working of capacitor start induction run single phase induction motor with vector diagram.	**04**
	(c)	Write types of single-phase induction motor, explain working of shaded pole induction motor.	**07**
Q.4	**(a)**	Explain working of Switched reluctance motor.	**03**
	(b)	Explain working and applications of Permanent magnet brushless DC motor.	**04**
	(c)	Derive EMF equation of an alternator, also explain pitch factor and distribution factor.	**07**
		OR	
Q.4	**(a)**	Write advantages and applications of linear induction motor.	**03**
	(b)	Explain vector diagrams of alternator in loaded condition.	**04**
	(c)	What is voltage regulation of an alternator, list the methods of voltage regulation. Explain ZPF method.	**07**

Q.5	**(a)**	Explain application, advantages and disadvantages of stepper motor.	**03**
	(b)	Explain conditions for parallel operation of alternators.	**04**
	(c)	What is synchronizing of an alternator? Explain all dark lamp method in detail.	**07**

OR

Q.5	**(a)**	What will be the effect on synchronous motor if it is over excited and under excited, explain with vector diagram.	**03**
	(b)	Draw and explain V-curve and inverted V-curve for synchronous motor.	**04**
	(c)	With vector diagram explain effect of change in excitation and effect of change in steam supply for alternators connected to bus bar.	**07**

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