Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – SUMMER 2024

Subject Code:3170916 Date:22-05-2024

Subject Name:Advanced Electric Drives

Time:02:30 PM TO 05:00 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)**	Describe Selected Harmonic Elimination with necessary figure.	**03**
	(b)	Explain in brief, the control of Voltage Source Inverter with necessary diagram.	**04**
	(c)	Draw and explain the equivalent circuit of a single –phase induction machine.	**07**
Q.2	**(a)**	Explain in short 3 level inverter.	**03**
	(b)	Differentiate between CSI and VSI.	**04**
	(c)	Explain Direct torque and flux control of induction motor.	**07**
		OR	
	(c)	Explain CSI fed synchronous motor drives.	**07**
Q.3	**(a)**	State advantages of vector control over scalar control.	**03**
	(b)	Discuss the points to be considered while selecting carrier frequency for inverter.	**04**
	(c)	Draw and explain operation of open loop V/f control of Induction motor with PWM voltage fed converter.	**07**
		OR	
Q.3	**(a)**	Why dynamic model Induction motor is required?	**03**
	(b)	Enlist advantages of V/f control of induction motor	**04**
	(c)	Write a note on Reference-frame theory, and state commonly used reference frames.	**07**
Q.4	**(a)**	Classify permanent magnet motors.	**03**
	(b)	Draw and explain SRM.	**04**
	(c)	Explain construction and working of BLDC motor.	**07**
		OR	
Q.4	**(a)**	Enlist various topologies of SRM drives.	**03**
	(b)	Compare BLDC and PMDC motors.	**04**
	(c)	Explain construction and working of PMDC motor.	**07**
Q.5	**(a)**	Discuss the effect of harmonics on induction motor.	**03**
	(b)	Write a short note on TMSLF2407 with reference to motion control.	**04**
	(c)	Draw and explain operation of open loop V/f control of synchronous motor drive.	**07**
		OR	
Q.5	**(a)**	Discuss the advantages of uses of DSP in electric drive system.	**03**
	(b)	Discuss PWM module in DSP.	**04**
	(c)	Draw and explain block diagram of closed loop speed control of SRM drive.	**07**

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