

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2023****Subject Code:3170916****Date:08-12-2023****Subject Name: Advanced Electric Drives****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) What is Harmonic? what is the frequency for 1 st , 3 rd , and 5 th harmonics?	03
	(b) Draw the block diagram of electric drive and explain each block in brief.	04
	(c) Explain PWM converter as line side rectifier with necessary figure.	07
Q.2	(a) List advantages of PWM inverters	03
	(b) Explain in brief, the control of voltage Source Inverter with necessary diagram.	04
	(c) Explain selective harmonic elimination technique for inverter	07
	OR	
	(c) Explain operation of H bridge as a 4-Q drive	07
Q.3	(a) Write relative merits and demerits of VSI and CSI.	03
	(b) Explain principle of Vector control of induction motor.	04
	(c) Write a note on Reference-frame theory.	07
	OR	
Q.3	(a) List various topologies of SRM drives.	03
	(b) Draw block diagram for closed loop speed control of SRM	04
	(c) Explain construction and working principle of SRM and its applications.	07
Q.4	(a) What is permanent magnet motor and how its work?	03
	(b) Draw figure showing construction of any one type of BLDC motor.	04
	(c) Explain vector control of PMSM and its applications.	07
	OR	
Q.4	(a) Advantages of synchronous motor drive.	03
	(b) Advantages and disadvantages of PMSM drive.	04
	(c) Explain BLDC machine drive.	07
Q.5	(a) What is the use of DSPs in motion control?	03
	(b) Discuss PWM module in DSP.	04
	(c) Explain various DSPs in detail.	07
	OR	
Q.5	(a) Compare direct torque control (DTC) with field oriented control	03
	(b) Write a short note on TMSLF2407 with reference to motion control	04
	(c) State names of some DSPs used in motion control and discuss the use of same.	07
