

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-VII EXAMINATION – WINTER 2025

Subject Code:3170916

Date:20-11-2025

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) Explain unipolar and bipolar PWM techniques.	03
	(b) Draw the block diagram of Electric drive and explain each block in brief.	04
	(c) Explain diode rectifier with boost chopper.	07
Q.2	(a) Discuss SVPWM technique in brief.	03
	(b) Compare three level inverter with conventional two level inverter	04
	(c) Explain dynamic model of induction motor using stationary reference frame.	07
OR		
	(c) Discuss significance of V/f control of induction motor. Discuss motor characteristics in constant torque and constant power region.	07
Q.3	(a) Compare DTC and FOC	03
	(b) Discuss the effect of harmonics on induction motor drive.	04
	(c) What is FOC? Explain FOC of induction motor using necessary block diagram.	07
OR		
Q.3	(a) List advantages of V/F control over other control technique	03
	(b) State the advantages and applications of synchronous motor drive	04
	(c) Draw and explain operation of open loop V/f control of synchronous motor drive	07
Q.4	(a) Compare PMSM with BLDC	03
	(b) List out the various topologies of SRM drives	04
	(c) Draw and explain CSI fed synchronous motor drives	07
OR		
Q.4	(a) Explain working of Switch Reluctance Motor	03
	(b) Discuss the advantages of DSPs used in electric drive system.	04
	(c) Draw and explain block diagram of closed loop speed control of SRM drive.	07
Q.5	(a) Write a short note on selective harmonic elimination technique.	03
	(b) Write short note on PWM module in DSP	04
	(c) Explain speed control of PMSM drive with necessary block diagram	07
OR		
Q.5	(a) State various DSP used for application of speed control of electric motor	03
	(b) Enlist the advantages of PMSM over an induction motor.	04
	(c) Explain speed control of BLDC drive with necessary block diagram	07
