

PRAGATI ENGINEERING COLLEGE: SURAMPALEM
(AUTONOMOUS)
M.Tech II Semester Regular/Supplementary Examinations, July – 2024

POWER ELECTRONIC CONTROL OF AC MACHINES
(PE&ED)

Time: 3 hours

Max. Marks: 60

Answer any FIVE questions
All questions carry EQUAL marks

5X12=60

Q.NO.		Question	BTL	CO	Marks
1.	a.	Explain closed loop speed control of induction motor drive with stator resistance.	K2	CO1	6M
	b.	Discuss the operation of voltage source inverter fed induction machine with relevant waveforms and circuit diagram?	K3	CO1	6M
2.	a.	Why frequency control is induction motor is more efficient than stator voltage control?	K4	CO1	6M
	b.	Explain the slip ring induction motor control of 3 phase IM drive in detail.	K2	CO1	6M
3	a.	Explain the vector control of line side PWM converter for 3 phase IM drive.	K2	CO2	6M
	b.	Find the efficiency of an induction motor operating at full load. The machine details are given in the following, 2000 hp, 2300V, 3 phase, star connected, 4 pole, 60Hz, Full load slip = 0.03746 $R_s = 0.02\Omega$; $R_r = 0.12\Omega$; $R_c = 451.2\Omega$; $X_m = 50\Omega$; $X_{ls} = X_{lr} = 0.32\Omega$.	K3	CO2	6M
4	a.	Discuss the direct vector control scheme for an induction motor.	K2	CO2	6M
	b.	Explain the merits and demerits of the PM Brushless DC Motor?	K2	CO3	6M
5.	a.	Explain the sensor-less control of BLDC motors.	K2	CO3	6M
	b.	Explain the closed loop control of synchronous motor drive with relevant diagrams.	K2	CO3	6M
6.	a	Explain how the railway traction dc motors are controlled using ac-dc converters	K2	CO4	6M
	b	Differentiate Motors employed in railway traction and road-vehicles.	K4	CO4	6M
7	a	Briefly explain the Power Electronic Control Circuits in Electric Vehicles.	K2	CO4	6M
	b	Draw and explain any two power converters for Switched reluctance motors.	K3	CO5	6M
8	a	Explain the different control techniques of the SRM drives briefly?	K2	CO5	6M
	b	Explain the characteristics of stepper motor for bipolar drive circuits.	K2	CO5	6M