Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

UG/PG DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2026

Second Semester

M.E Applied Electronics

PAPT2423 POWER CONVERSION CIRCUITS FOR ELECTRONICS

Regulations – 2024

Duration: 3 Hrs. ***Maximum: 100 Marks***

PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

Q.No	Questions	BLT	CO	Marks
1.	Define latching current in the context of an SCR.	L1	1	2
2.	Illustrate the two-transistor model equivalent circuit of an SCR	L2	1	2
3.	List any two benefits of using an opto-SCR in industrial applications.	L1	2	2
4.	Differentiate between natural commutation and forced commutation of a thyristor.	L2	2	2
5.	How does PWM contribute to the operation of inverter circuits?	L2	3	2
6.	List the major advantages offered by PWM-based inverters.	L1	3	2
7.	How is an SCR applied in timer circuit operations?	L2	4	2
8.	Mention two key applications of dielectric heating in industry.	L1	4	2
9.	Compare the characteristics of AC drives and DC drives.	L2	5	2
10.	State any two applications of SCADA systems in industrial environments.	L1	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

Q.No		Questions	BLT	CO	Marks
11.	a	Explain the various characteristics of an SCR (Silicon Controlled Rectifier), including the forward and reverse characteristics. Provide a clear description of the characteristic curves with relevant sketches.	L2	1	16
		Or			
	b	Describe the working principles and characteristics of power semiconductor switches such as rectifier diodes and fast recovery diodes. How do they differ in terms of performance and application?	L2	1	16
12.	a	Construct single phase-controlled rectifiers based on SCR and explain its operations.	L3	2	16
		Or			
	b	Calculate average and RMS output voltage for a single-phase half-controlled rectifier with RL load for $\alpha = 60°$.	L3	2	16

13.	a	List and explain different types of DC-DC converters used in power electronics.	L2	3	16
		Or			
	b	Explain chopper-based speed control of DC motor with necessary circuits and waveforms.	L2	3	16
14.	a	Explain the operation of IC 555 timer in monostable and astable modes with waveforms and applications.	L2	4	16
		Or			
	b	Describe the structure and operation of servomotors. Compare them with stepper motors.	L2	4	16
15.	a	Demonstrate the working principles of AC and DC driver circuits used in industrial applications.	L2	5	16
		Or			
	b	Describe the architecture of SCADA with a neat block diagram and explain its role in automation systems.	L2	5	16

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