Course Code: 1950208 Roll No: **MLRS- R19**

MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section2(f) & 12(B)of the UGC act,1956

III B.Tech I Sem Supply End Examination, July 2022

Power Electronics

(EEE)

Time: 3 Hours. **Max. Marks: 70**

Note: 1. Question paper consists: Part-A and Part-B.
2. In Part – A, answer all questions which carries 20 marks.
3. In Part – B, answer any one question from each unit.
Each question carries 10 marks and may have a, b as sub questions.

PART- A

(10*2 Marks = 20 Marks)

1.	a)	On state voltage drop across a thyristor used in a 230-V supply system is of the order of	2M	CO1	BL1
	b)	Turn on time of an SCR in series with RL circuit can be reduced by	2M	CO1	BL1
	c)	In a single phase semi converter, for continuous conduction ,freewheeling diode conducts for	2M	CO2	BL1
	d)	What is the expression of three phase full converter the average output voltage expression is	2M	CO2	BL1
	e)	In dc chopper, per unit ripple is maximum for duty cycle α	2M	CO3	BL1
	f)	A step-up chopper has Vs as the source voltage and α as the duty cycle. The output voltage for this chopper is given by	2M	CO3	BL3
	g)	Draw the circuit of single phase half bridge inverter	2M	CO4	BL1
	h)	What should be the pulse width in case of single pulse width modulation to eliminate third harmonic	2M	CO4	BL3
	i)	Mention the applications of ac voltage controller	2M	CO5	BL1
	j)	What is a cyclo converter	2M	CO5	BL1

PART- B

(10*5 Marks = 50 Marks)

2	a)	Explain turn on methods of SCR	5M	CO1	BL4
	b)	Explain the operation and characteristics of MOSFET	5M	CO1	BL4
		OR			
3		Discuss the various ratings and protection circuits of thyristor	10M	CO1	BL2
4	a)	Describe the operation of single phase half controlled converter with RLE load	5M	CO2	BL2
	b)	A single phase full converter is supplied from 230V, 50Hz source. The load consists of R=10 and a large inductance so as to render the load current constant. For a firing angle of delay of 30^0detrmine average output voltage and average output current.	5M	CO2	BL3

OR

5		Discuss the effect of source inductance on the performance of single phase full converter with necessary waveforms and derive the output voltage expression.	10M	CO2	BL2
6	a)	Explain the operation of buck boost converter	5M	CO3	BL4
	b)	A step up chopper has input voltage of 200V and output voltage of 600V.If the non conducting time of thyristor chopper is 100μs,compute the pulse width of output voltage.	5M	CO3	BL3

OR

7		Obtain the steady state analysis of buck converter with RLE load	10M	CO3	BL3
8	a)	Explain the operation of single phase bridge inverter with R-L load	5M	CO4	BL4
	b)	Explain sinusoidal pulse width modulation of single phase inverter	5M	CO4	BL4

OR

9		Discuss the operation of three phase full bridge inverter with 120^0 mode of operation	10M	CO4	BL2
10	a)	Explain the operation of step down cyclo converter	5M	CO5	BL4
	b)	A single phase voltage controller feeds power to a resistive load 3Ω from 230V,50Hz source. Calculate the maximum values of average and rms thyristor currents for any firing angle α	5M	CO5	BL3

OR

11		Discuss the operation of single phase ac voltage controller with R and RL loads	10M	CO5	BL2

---oo0oo---