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

MLRS

III B.Tech I Sem Regular End Examination, January 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)	Draw the V-I characteristics of SCR	2M	CO1	BL1
	b)	How SCR is protected from high voltages	2M	CO1	BL2
	c)	Define firing angle	2M	CO2	BL1
	d)	How a freewheeling diode can improve the power factor	2M	CO2	BL2
	e)	What is the expression of output voltage of a boost converter	2M	CO3	BL1
	f)	What are the various voltage control techniques of chopper	2M	CO3	BL1
	g)	Define total harmonic distortion	2M	CO4	BL1
	h)	How fifth harmonic is eliminated using single pulse width modulation	2M	CO4	BL2
	i)	What type of commutation is used in step down cyclo converter	2M	CO5	BL1
	j)	Mention the applications of ac voltage controller	2M	CO5	BL1

PART- B
(10*5 Marks = 50 Marks)

2	a)	Explain the dynamic characteristics of SCR?	5M	CO1	BL4
	b)	Discuss the firing pulse generation of UJT triggering?	5M	CO1	BL2

OR

3		Discuss load commutation and current commutation techniques	10M	CO1	BL2

4	a)	Describe the operation of single phase full converter with R-load.	5M	CO2	BL2
	b)	A single phase full converter feeds power to RLE load with R=5 ohm, L=6 mH and E=60V.The ac source voltage is 230V,50Hz.For continuous conduction ,find the average value of load current for a firing angle delay of 30⁰.	5M	CO2	BL3

OR

5		What are the various three phase converters available and describe the operation of three phase full converter with R-load with 120^0	10M	CO2	BL2
6	a)	Explain the operation of boost converter.	5M	CO3	BL4
	b)	An RLE load is operating in a chopper circuit from 600V dc source. For a load, L=0.06H and R=5Ω. For a duty cycle of 0.2, Find the chopping frequency to limit the amplitude of load current excursion to 10A.	5M	CO3	BL3

OR

7		Obtain the steady state analysis step down chopper for RL load with neat circuit diagram.	10M	CO3	BL3
8	a)	What are the various PWM techniques ,discuss the operation of single pulse width modulation	5M	CO4	BL2
	b)	A single phase full bridge inverter has RL load of R=4 ohm, L=35mH. The dc input voltage is 230V and output frequency is 50Hz. Find the rms value of fundamental current	5M	CO4	BL3

OR

9		Draw the circuit of three phase full bridge inverter and explain the operation during 180^0 mode of operation	10M	CO4	BL3
10	a)	Explain the operation of single phase AC voltage controller with R-L load	5M	CO5	BL4
	b)	A single phase voltage controller feeds power to a resistive load of 3 Ω from 230V, 50Hz source. Calculate the maximum value of average and rms thyristor currents for any firing angle α.	5M	CO5	BL3

OR

11		Explain the operation of step up and step down cyclo converter	10M	CO5	BL4

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