R18

Reg. No:

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Regular Examinations October-2020
POWER ELECTRONICS
(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 60

PART-A
(Answer all the Questions **5 x 2 = 10** Marks)

1	**a**	Define forward break overvoltage.	**2M**
	b	List the different applications of phase-controlled converters.	**2M**
	c	What are the applications of dc chopper?	**2M**
	d	What is meant by PWM control?	**2M**
	e	Write the advantages of VSI.	**2M**

PART-B
(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2 Briefly explain about insulated gate bipolar transistor (IGBT) and its switching characteristics.   **10M**

OR

3 Explain briefly voltage commutation and Draw the output waveforms.   **10M**

UNIT-II

4 A single-phase half wave converter operated from a 230V, 50Hz supply. If the load is resistive of value 10 Ω and firing angle is 60^0. Determine   i) the rectification efficiency
ii) Form factor   iii) ripple factor   iv) Transformer utilization factor
v) Peak inverse voltage of thyristor.   **10M**

OR

5 Explain the operation of three-phase fully controlled rectifier with R load and derive the average and RMS load voltage.   **10M**

UNIT-III

6 Explain the buck converter operation with help of diagram and draw the output waveforms.   **10M**

OR

7 Explain the boost converter operation with help of diagram and draw the output waveforms.   **10M**

UNIT-IV

8 Explain briefly bipolar sinusoidal modulation with neat diagrams.   **10M**

OR

9 A 1-Ø half bridge inverter has a resistive load of R= 3Ω, and the D.C. source voltage $V_s/2$=115V. (a) Sketch the waveforms for V_0, load current i_{01}, currents through thyristor 1 and diode 1 and voltage across thyristor T1.
(b) Find the power delivered to load due to fundamental current
(c) Check whether forced commutation is required.   **10M**

UNIT-V

10 Explain the three-phase Voltage Source Inverter with 180^0 conduction mode Also derive the output voltage, output current.   **10M**

OR

11 Explain briefly three-phase sinusoidal pulse width modulation with neat diagrams.   **10M**

END