Reg. No:

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Regular Examinations December-2021
POWER ELECTRONICS
(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1 Briefly explain about Insulated Gate Bipolar Transistor and its switching   L2   12M
   characteristics.

OR

2 Explain the Resistance firing circuit with the necessary waveforms.   L2   12M

UNIT-II

3 Explain the operation of single phase Full wave converter with R load and necessary   L2   12M
   waveforms. Also derive the output voltage, output current, RMS output voltages.

OR

4 **a** A single phase full converter is made to deliver a constant load current. For zero   L3   6M
   firing angle, the overlap angle is 15°, calculate the overlap angle when firing angle
   is   i) 30°   ii) 45°   and   iii) 60°
   b What is the difference between half controlled and fully controlled bridge rectifier.   L2   6M

UNIT-III

5 What is a dc chopper? Describe various types of chopper configurations. With   L4   12M
   appropriate diagram wherever necessary.

OR

6 The buck converter has an input voltage of E_{dc} = 12V the required average output   L3   12M
   voltage is E_o=5V at R=500Ω and the peak to peak output voltage is 20mV, the
   switching frequency is 25KHZ. If the peak to peak ripple current of inductor is
   limited to 0.8A, determine (i) The duty cycle (ii) The filter inductance L
   (iii) The filter Capacitance C. (iv) The critical values of L and C.

UNIT-IV

7 Explain the operation of single phase to single phase bridge type step-up cyclo-   L2   12M
   converter with continuous mode.

OR

8 Explain bridge type step-up cycloconverter with RL load for discontinuous   L4   12M
   conduction mode.

UNIT-V

9 Explain the operation of single phase full wave ac voltage controller with R-L load.   L2   12M

OR

10 Explain the operation of TRIAC firing circuit.   L2   12M

*** END ***