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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Supplementary Examinations August-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 Explain the dynamic characteristics of SCR with neat waveforms. 12M

OR

2 a Explain the switching characteristics of BJT. 6M

b Explain the input and transfer characteristics of an IGBT with neat sketch. 6M

UNIT-II

3 Explain the operation of single phase half wave converter with R-Load at $\alpha=60^\circ$ with necessary wave forms. Also derive the output voltage and output current. 12M

OR

4 a What are the effects of source inductance in single phase controlled rectifier? 8M

b Give the differences between midpoint and bridge type converters. 4M

UNIT-III

5 Explain the effect of source inductance in the operation of three phase fully controlled converter with neat wave forms. 12M

OR

6 Explain the operation of single phase dual converter with circulating and non-circulating mode of operation with neat wave forms. 12M

UNIT-IV

7 Explain the bridge type cyclo-converter for discontinuous conduction mode with neat waveforms. 12M

OR

8 a A single phase half wave ac voltage controller feeds a load of $R=20$ ohm with an input voltage of 230v, 50Hz, firing angle of thyristor is 45° . 8M

Determine i) Rms value of output voltage.

ii) Power delivered to load and input power factor.

iii) Average input current.

b List out the applications of AC voltage controllers. 4M

UNIT-V

9 a Draw and explain the step-down chopper and derive the expression for output voltage. 8M

b List out the applications of dc chopper. 4M

OR

10 Describe various types of pulse width modulation techniques (PWM) in inverter with neat waveforms. 12M

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