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**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**  
(AUTONOMOUS)**B.Tech III Year I Semester Supplementary Examinations Feb-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 a With neat sketch, explain the two transistor analogy of the thyristor. **8M**  
b Explain Latching current and Holding current. **4M**

**OR**

- 2 a Explain principle, working and characteristics of MOSFET with neat sketch. **8M**  
b Differentiate between MOSFET and BJT. **4M**

**UNIT-II**

- 3 a A single phase full converter feeds power to RLE load with  $R=60\Omega$ ,  $L=6\text{mH}$  and  $E=60\text{V}$ . The ac source voltage is 230V, 50Hz. For continuous conduction, find the average value of load current for a firing delay of  $50^\circ$ . In case one of the four SCRs gets open circuit due to a fault, find the new value of average load current taking the output current as continuous form. **8M**  
b List out the applications of phase controlled converters. **4M**

**OR**

- 4 Explain the operation of single phase full wave midpoint converter with RL load. Also derive the output voltage and output current equations. **12M**

**UNIT-III**

- 5 Explain the operation of three phase dual converter with circulating current type with neat waveforms. **12M**

**OR**

- 6 At firing angle of  $120^\circ$ , explain the operation of three phases fully controlled converter with RLE load with necessary waveforms. **12M**

**UNIT-IV**

- 7 Explain the 1- $\phi$  AC voltage controllers with R-L load with neat diagrams. **12M**

**OR**

- 8 a Briefly explain the operation of TRIAC in different modes of operation. **8M**  
b List out the applications of TRIAC. **4M**

**UNIT-V**

- 9 a Write short notes on various PWM techniques of choppers with neat waveforms. **8M**  
b What are the advantages and disadvantages of PWM techniques? **4M**

**OR**

- 10 a Explain the single phase half bridge voltage source inverter with necessary waveforms. **8M**  
b List out the applications of inverters. **4M**

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