

Reg. No. : 

--	--	--	--	--	--	--	--	--	--	--	--

**Question Paper Code : 86595**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Sixth Semester

Electronics and Electronics Engineering

EE 1353 A – POWER ELECTRONICS

(Common to Electronics and Instrumentation Engineering and Instrumentation  
and Control Engineering)

(Regulations 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define circuit turn off time.
2. What are the applications of TRAIC?
3. Define displacement factor and current harmonic factor.
4. What do you mean by line commutated inverter?
5. What are the advantages of CUK converters?
6. What is the principle of current limit control?
7. Differentiate VSI and CSI.
8. Define modulation index in PWM.
9. List the applications of AC voltage regulator.
10. What is the necessity of applying PWM technique to the AC voltage controller?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the principle of operation of MOSFET and draw the transfer, output and switching characteristics of MOSFET. (10)
- (ii) Explain the R-C triggering of SCR. (6)

Or

- (b) (i) Draw and explain the forward characteristics of SCR using two transistor model of SCR. (10)
- (ii) Describe the working of TRIAC. (6)
12. (a) Describe briefly about the operation of a single phase semi converter feeding RLE load. What is the effect of adding a freewheeling diode on the performance of the converter?

Or

- (b) Describe with necessary diagrams and waveforms the operation of three phase half controlled converter with RL load. Write the advantages over 1-phase controlled rectifier.
13. (a) What is SMPS? List the various types of SMPS. Describe SMPS with Fly back configuration.

Or

- (b) What is a switching mode regulator? List its types and explain any one regulator with appropriate waveform and circuit diagram.
14. (a) Explain the multiple pulse modulation technique with necessary expressions.

Or

- (b) Describe the operation of single phase auto sequentially commutated CSI with  $L$  load prove that total circuit turn off time for this inverter is given by  $t_c = (1 + \pi/2) * \sqrt{LC}$  with necessary expressions. Sketch the waveforms for gating signals, capacitor voltage and current and load current.
15. (a) Draw the possible configurations of single phase AC voltage controller. Explain the principle of any one type of AC voltage controller in detail.

Or

- (b) Describe the principle of working of single phase to single phase step up cycloconverter with bridge type configuration and appropriate waveforms.