No. of Printed Pages : 3   **BIEE-024**

B. TECH.-VIEP-ELECTRICAL ENGINEERING (BTELVI)
Term-End Examination
June, 2019

BIEE-024 : POWER ELECTRONICS

Time : 3 Hours   *Maximum Marks : 70*

Note : *Attempt any **seven** questions. All questions carry equal marks. Use of scientific calculator is permitted. Assume suitable data, wherever not provided.*

1. Discuss the different operating region of SCR. Draw and explain the static and dynamic characteristics of an SCR.   10

2. (a) Why is bridge circuit preferred over the centre tapped transformer ?   4

   (b) Describe of operation of single phase full wave rectifier with relevant voltage and current waveform on R-L load.   6

3. What is TRIAC ? Explain the mode of operation of a triac with its characteristics.   10

4. Explain the effect of source impedance on the output voltage of a single phase full converter.   10

5. A single-phase voltage controller has input voltage of 240 V, 50 Hz and a load of R = 15 Ω for a 6 cycles on and 4 cycles off, determine : 10

   (a) RMS output voltage

   (b) Input power factor

   (c) Average and RMS value of thyristor current

6. Describe the working of four quadrant chopper. Also explain class B commutation with appropriate waveform.   10

7. What are the industrial applications of cyclo-converter ? Explain the operation of single phase to single phase step down cycloconverter with waveform for $f/3$, $f/4$ (where f is frequency).

                                              10

8. Explain how two single phase full converters can be connected back to back to form a circulating type of dual converter. Discuss its operating with the help of voltage waveform across each converter.   10

9. Explain with waveform of three phase inverter for 180° conduction of each thyristor. Compare the voltage source inverter and current source inverter.   10

10. Write short notes on any *two* of the following :

$$2 \times 5 = 10$$

(a) Services and parallel connection of SCR

(b) UJT

(c) Pulse width modulation switching scheme for voltage control