EE 313 (R-20)

Total No. of Questions : 10] [Total No.of Pages : 02

III/IV B. Tech. DEGREE EXAMINATIONS, DECEMBER - 2022

First Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

POWER ELECTRONICS

Time : **Three Hours** Maximum : **60** Marks

Answer ONE question from each Unit.

All questions carry equal marks. 5x12=60 M

UNIT - I

1. a) Explain TRIAC triggering and turnoff methods?
   b) Draw and explain the simultaneous triggering circuit of series connected SCRs.

(OR)

2. a) Explain the construction of SCS with neat diagram. Draw its V-I characteristics.
   b) What is the function of fast recovery diode? Explain with applications of power diodes.

UNIT - II

3. a) A single phase voltage controller has input voltage of 230 V, 50 Hz and a load of R=15Ω . For 6 cycles on and 4 cycles off, determine (i) rms output voltage (ii) input PF.
   b) Explain single phase full converter of R load with neat sketch?

(OR)

4. a) How pwm helps to control for PF? Discuss it.
   b) In a single phase midpoint converter turns ratio from primary to each secondary is 2. The source voltage is 230 V, 50 Hz. For a resistive load of 5Ω, calculate the maximum value of average output voltage and load current and the corresponding firing and conduction angles.

UNIT - III

5. a) With the help of neat circuit diagram and associated waveforms, explain operation of 1-phase full bridge voltage source inverter with RL load.
   b) Write short notes of PWM inverter.

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(OR)

6. a) Explain about voltage source inveter? Mention advantages.
   b) Discuss about parallel inverer with neat sketch.

UNIT - IV

7. Explain different methods of speed control of DC motors in detail.

(OR)

8. a) Explain operation with neat sketches of waveform of Class-B Chopper? Derive the ouput current.
   b) Describe the control scheme for a cyclo converter using voltage sensing principle of converter group selection. Also, draw and discuss the various voltage waveforms of a control scheme.

UNIT - V

9. a) A single phase voltage controller with resistive load has the following data: supply mains: 200 V, 50 Hz, R=1 5Ω. Calculate the firing angle at which the greatest forward or reverse voltage is applied to either of the thyristors and the magnitude of these voltages.
   b) Explain PWM sinusoidal 1-ϕ inverter with neat diagram.

(OR)

10. a) Explain the operation of single phase advanced modulation technique for inverter with neat diagram.
    b) Write short notes on delta modulation technique for improved performance of 1-ϕ inverter?