

Total No. of Questions : 8]

P2961

SEAT No. :

[Total No. of Pages : 2

[5669]-551

T.E. (Electronics Engg.)

POWER ELECTRONICS AND APPLICATIONS

(2015 Pattern) (Semester - I)

Time : 2½ Hours]

Instructions to the candidates:

- 1) Figures to right indicate full marks
- 2) Neat diagrams must be drawn wherever necessary.

[Max. Marks : 70

Q1) a) What are the advantages & disadvantages of water cooling and oil cooling? [7]

b) Explain construction, operation and steady state characteristics of IGBT. [7]

c) Draw and explain switching characteristics of MOSFET. [6]

OR

Q2) a) Draw two transistor analogy of SCR. Derive its anode current equation. [7]

b) Draw and explain three phase Full converter for RL Load with waveforms. [7]

c) Explain Construction: Operation of TRIAC with its VI characteristics. [6]

Q3) a) Explain three phase PWM inverters. [8]

b) Draw and explain three phase inverter with the help of waveform for 120° conduction mode for R load. [8]

OR

Q4) a) Explain Variable frequency control of three phase inverters. [8]

b) A single phase transistorized bridge inverter has a resistive load of $R = 3\Omega$ and the dc input voltage of $E_{dc} = 48$ Volts. Determine: i) Transistor ratings ii) Total Harmonic distortion iii) Distortion factor DF iv) Harmonic factor and distortion factor at the lowest order harmonic. [8]

P.T.O.

Q5) a) A step down dc chopper has a resistive load of $R = 15\Omega$ and input voltage $E_{dc} = 200V$. When the chopper remains ON, its voltage drop is 2.5V. The chopper frequency is 1KHz. If the duty cycle is 50%, determine: i) Average output voltage ii) RMS output voltage iii) Chopper efficiency. [8]

b) Explain flyback converter (SMPS) with circuit diagram, waveforms and operational analysis. [10]

OR

Q6) a) Explain in details the operation of step up chopper. Derive the expression for average output voltage. [8]

b) What is a chopper? Explain with circuit diagram and waveforms, working of 2 quadrant and 4 quadrant chopper. [10]

Q7) a) Explain the operation of electronic ballast with the help of block diagram. Also state its advantages. [8]

b) Draw and explain bipolar HVDC transmission system. Also state its advantages. [8]

OR

Q8) a) Explain Classification of electric drives with selection of power converters for different drive applications. [8]

b) Draw and explain online UPS with neat diagram. [8]

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