

Total No. of Questions : 10]

SEAT No. :

P 3290

[Total No. of Pages : 2

[5353] - 163
TE (Electrical)
POWER ELECTRONICS
(2012 Pattern)

Time : 2½ Hours]

[Max. Marks :70

Instructions to the candidates:

- 1) *Solve questions 1 or 2 question 3 or 4 question 5 or 6, question 7 or 8, question 9 or 10.*
- 2) *Assume suitable data, if necessary.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*

- Q1)** a) Draw Turn On characteristics of SCR and mark t_d , t_r , t_s On it. [5]
b) Explain in details TRIAC modes of operation. In which modes TRIAC is sensitive? [5]

OR

- Q2)** a) Draw neat circuit diagram for a 1 phase semi controlled converter feeding R-L load at $\alpha = 60^\circ$. Draw output voltage waveform showing devices conducting during one cycle of input ac voltage [5]
b) Explain the difference between SCR and GTO. [5]

- Q3)** a) For a 3 phase fully controlled Bridge converter feeding resistive load
i) Draw neat circuit diagram [2]
ii) Write the switching sequence of SCRS clearly [2]
iii) State expression for average D.C. output voltage [1]
b) For single phase A.C. voltage regulator with R L load
i) Draw circuit diagram [2]
ii) Draw output voltage waveform at firing angle 60° [2]
iii) Write formula for rms output voltage [1]

OR

- Q4)** a) Draw neat circuit diagram and explain working of single phase fully controlled rectifier feeding RL load with Free Wheeling Diode [5]

P.T.O

- b) For single phase A.C. voltage regulator with R load
- i) Draw circuit diagram [2]
 - ii) Draw output voltage waveform at firing angle 60° [2]
 - iii) Write formula for rms output voltage [1]

- Q5)** a) Draw and explain switching characteristics of MOSFET. [8]
b) Explain voltage control strategies of chopper with waveforms. [8]

OR

- Q6)** a) Explain output and Transfer characteristics of IGBT [8]
b) A chopper is operating on TRC principle at a frequency of 2 kHz on a 220 volt D.C. supply. If the load voltage is 170 volt, compute conduction and blocking period of thyristor in each cycle. [8]

- Q7)** a) Explain with neat circuit diagram single phase full bridge voltage source inverter and draw output voltage waveforms [8]
b) Explain Multiple pulse PWM technique for single phase VSI [8]

OR

- Q8)** a) Explain with neat circuit diagram single phase half bridge voltage source inverter and draw output voltage waveforms [8]
b) Explain sinusoidal pulse PWM technique for single phase VSI [8]

- Q9)** a) Explain working of three phase inverter in 120° mode of operation. For star connected load draw output voltage waveforms. Show devices conducting in each step. [12]
b) Compare between 120 deg and 180 deg mode of operation of 3 phase inverters. [6]

OR

- Q10)** a) Explain the concept of multilevel inverter. State its different types. [6]
b) Draw Cascaded bridge Multilevel inverter and explain its working. State applications. [12]

