Total No. of Questions : 8]

SEAT No. :

P2437

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T.E. (E & TC Engineering)

POWER ELECTRONICS

(2012 Pattern) (Semester - II)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7or Q8.***
2) ***Draw neat diagrams & waveforms wherever necessary.***
3) ***Figures to right indicate full marks.***
4) ***Use of nonprogrammable calculators is allowed.***
5) ***Assume suitable data wherever necessary.***

Q1) a) Draw and Explain steady state characteristics of IGBT. **[7]**

b) Explain two transistor analogy of an SCR. Drive anode current equation of SCR. **[6]**

c) Draw neat circuit diagram and explain single phase full bridge converter with R-L load. State different performance parameters of the same. **[7]**

OR

Q2) a) Explain with circuit diagram and waveforms three phase inverter with 120 degree conduction mode. **[7]**

b) Draw and Explain the switching characteristics of SCR. **[6]**

c) Draw the circuit diagram of three phase Half Controlled Bridge converter with R load. Explain its operation. Draw the output voltage waveform for firing angles 30 degree & 60 degree. **[7]**

Q3) a) What is DC to DC converter? Explain Step — down Chopper (highly inductive load) with circuit diagram & waveforms. Also derive output voltage equation. **[9]**

b) Draw the circuit diagram of single phase AC Voltage controller with R load. Explain its operation. Draw the waveform of output voltage. **[9]**

OR

Q4) a) Input to the step up chopper is 200 V. The output required is 600 V. If the conducting time is 200 μ sec, compute Chopping frequency. If the pulse width is halved for constant frequency of operation, find the value of new output voltage. **[9]**

b) Draw the block schematic of SMPS and explain its advantages over Linear power supply. **[9]**

P.T.O.

Q5) a) Explain OFF-line UPS with neat block-diagram. State its specifications and applications. **[6]**

b) Explain with circuit diagram working of single phase separately excited DC motor drive. Draw neat waveforms across load. **[10]**

OR

Q6) a) What are AC drives? Explain with block diagram, speed control technique of three phase Induction motor by using V/F method. **[8]**

b) Write short notes on: **[8]**

i) Electronic ballast and

ii) Battery Charger

Q7) a) Explain SLR half bridge DC/DC converter with neat circuit diagram and waveforms. **[8]**

b) Explain dv/dt di/dt and snubber circuit in detail. **[8]**

OR

Q8) a) Explain with circuit diagram and neat waveforms ZVS resonant converters. **[10]**

b) Explain overvoltage and over current protection circuits. **[6]**