Total No. of Questions : 8]

SEAT No. :

**P2584**

[Total No. of Pages : 2

# [5153]-560
# T.E. (E & TC Engineering)
# POWER ELECTRONICS
## (2012 Pattern) (Semester-II)(End Semester)

*Time : 2½ Hours]* *[Max. Marks : 70*

***Instructions to the candidates:***

1) ***Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.***
2) ***Draw neat diagrams & must be drawn wherever necessary.***
3) ***Figures to right indicates full marks.***
4) ***Use of nonprogrammable calculators is allowed.***
5) ***Assume suitable data wherever necessary.***

***Q1)*** a) Draw steady state characteristics of SCR. Explain IL, $I_H$ $V_{BO}$, $V_{BR}$, & show them on the characteristics. **[7]**

b) Explain two transistor analogy of an SCR. Drive anode current equation of SCR. **[7]**

c) Draw the circuit diagram of Gate Drive circuit for IGBT. Explain its operation. **[6]**

OR

***Q2)*** a) Draw the construction of Power MOSFET and explain steady state characteristics of Power MOSFET. Compare it with SCR and IGBT. **[7]**

b) Explain 180 degree conduction method of three phase Voltage Source Inverter for balanced star connected resistive load. **[6]**

c) Draw the circuit diagram of single phase Full Controlled Bridge rectifier with R-L load. Explain its operation. Draw the waveform of output voltage and Current. **[7]**

***Q3)*** a) What is DC to DC converter? Explain different methods for controlling the output voltage of Chopper. **[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) In a dc chopper, the average load current is 30 Amps, chopping frequency is 250 Hz, supply voltage is 110 volts. Calculate the ON and OFF periods of the chopper if the load resistance is 2 ohms. **[9]**

***P.T.O.***

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

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

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

OR

***Q6)*** a) Compare ON-Line & OFF-Line UPS. Justify why ON-Line UPS is better. **[8]**

b) Explain electronic ballast. What are the advantages of fluorescent lamp over conventional lamp? **[8]**

***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 ZCS resonant converters. **[10]**

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

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