Total No. of Questions : 6]

SEAT No :

P187

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APR -17/ TE/Insem.-23
T.E. (E&TC Engineering)
POWER ELECTRONICS
(2012 Course) (Semester-II)

Time : 1 Hour] *[Max. Marks : 30*

Instructions to the candidates:

1) ***Answer Q1 or Q2, Q3 or Q4, Q5 or Q6.***
2) ***Neat diagrams and waveforms must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Use of non programmable Calculator is allowed.***
5) ***Assume suitable data, if necessary.***

Q1) a) Explain construction & steady state characteristics of SCR. **[6]**

b) For an SCR, the gate triggering circuit has a source voltage of 15V and load line slope of - 120 V/A. The minimum gate current to turn on the SCR is 25mA. If average gate power dissipation is 0.4W, calculate triggering voltage & triggering current. **[4]**

OR

Q2) a) Draw & explain synchronized UJT triggering circuit for SCR with waveforms. **[6]**

b) Compare power MOSFET with IGBT. **[4]**

Q3) a) Draw & explain single phase fully controlled bridge converter for R-L load with various o/p voltage waveforms. **[6]**

b) A single phase semi converter is operated from 230V, 50Hz AC supply. The load is resistive having resistance of 10Ω. If the firing angle (α) is 60^o, calculate

i) Average o/p voltage

ii) Rms o/p voltage. **[4]**

OR

P.T.O.

Q4) a) Draw & explain three phase fully controlled bridge converter for R load with o/p voltage waveforms. **[7]**

b) What is commutation? Explain natural commutation with forced commutation for SCR. **[3]**

Q5) a) Draw & explain single phase full bridge inverter for R-L load with o/p voltage & current waveforms. **[5]**

b) Single phase full bridge inverter is operated from 48V dc supply, it has a resistive load of R = 2.4Ω. Find its rms o/p voltage at fundamental frequency. **[2]**

c) Compare free wheeling diode & feedback diode? **[3]**

OR

Q6) a) Compare 180^{o} mode and 120^{o} mode in three phase inverters for balanced star R load. **[6]**

b) Write a note on PWM inverters. **[4]**