

Total No. of Questions : 6]

SEAT No :

P187

[Total No. of Pages :2

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°, 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 $R = 2.4\Omega$. Find its rms o/p voltage at fundamental frequency. [2]

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

OR

Q6) a) Compare 180° mode and 120° mode in three phase inverters for balanced star R load. [6]

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

