

Total No. of Questions : 6]

SEAT No. :

P3713

[Total No. of Pages :2

**Engg. - 24**

**T. E. (Electrical) (Semester-I)**

**POWER ELECTRONICS (In Sem.)**

**(2012 Pattern)**

*Time :1 Hour]*

*[Max. Marks :30*

*Instructions to the candidates :*

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

**Q1) a) Draw and explain VI/Static characteristic of SCR. [6]**

**b) Define the following terms in SCR. [4]**

- i) Forward break over voltage
- ii) Latching current
- iii) Holding current
- iv)  $I^2t$  rating

**OR**

**Q2) a) Draw two transistor analogy of SCR and derive equation of anode current. [6]**

**b) What are the different turns on method of SCR? Explain any two. [4]**

**Q3) For fully controlled bridge converter with RL load without freewheeling diode**

- a) Draw circuit diagram [1]
- b) Draw output voltage is waveform assuming inductor is sufficient to maintain constant current at firing angle  $30^\circ$  and  $120^\circ$  [3]
- c) Derive average output voltage and current [2]
- d) Derive rms output voltage and current [2]
- e) Derive rectification efficiency and power factor [2]

**OR**

**P.T.O.**

- Q4)** a) Explain effect of source inductance on output voltage of converter. [6]  
b) Explain difference between half wave converter, half controlled converter and fully controlled converter. [4]

- Q5)** a) Draw construction of TRIAC. Explain its four modes of operation. [6]  
b) Draw circuit diagram of three phase fully controlled bridge converter. Also draw output voltage waveform for firing angle  $0^\circ$  and  $60^\circ$ . [4]

**OR**

- Q6)** For single phase AC voltage regulator with R load.  
a) Draw circuit diagram [1]  
b) Draw output voltage waveform at firing angle  $30^\circ$  and  $120^\circ$  [3]  
c) Derive average output voltage and current [3]  
d) Derive rms output voltage and current [3]

