Total No. of Questions : 6]

SEAT No. :

P5030

[Total No. of Pages : 2

TE / Insem - 528

T.E. (Electrical)

POWER ELECTRONICS

(2012 Pattern)

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

Instructions to the candidates:

1) ***Solve Q.1 or Q.2 Q.3 or Q.4 Q.5 or Q.6.***
2) ***Neat diagram 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) Define latching and holding currents in the context of SCR. Show these currents on its static I -V characteristics. **[5]**

b) State the turn on methods of thyristor. Explain the method which is commonly used. **[5]**

OR

Q2) a) Explain the difference between an SCR and GTO. **[5]**

b) Explain the over current and thermal protection of SCR. **[5]**

Q3) a) Explain I phase fully controlled bridge converter with R load and draw output voltage waveforms for firing angle of 60 degrees. **[6]**

b) Derive the expression of output voltage of single phase fully controlled converter by taking into account the effect of source inductance. **[4]**

OR

Q4) a) Draw neat circuit diagram for a 1phase semi controlled converter feeding R-L load at $\alpha = 30°$. Draw output voltage waveform showing devices conducting during one cycle of input ac voltage. **[6]**

b) Draw neat circuit diagram and explain working of single phase fully controlled bridge converter feeding RL load with free wheeling diode **[4]**

P.T.O

Q5) For a 3 phase fully controlled bridge converter feeding resistive load

a) Draw neat circuit diagram **[1]**

b) Draw output voltage and current waveforms at $\alpha = 30°$ **[4]**

c) Write the switching sequence of SCRS clearly **[3]**

d) Derive expression for average output voltage **[2]**

OR

Q6) a) Explain application TRIAC as a light dimmer switch **[5]**

b) For a single phase full wave A.C. voltage regulator with R load

i) Draw circuit diagram **[1]**

ii) Draw output voltage waveform at firing angle 45 ° **[2]**

iii) Derive the formula for rms output voltage **[2]**

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