Total No. of Questions : 4]

SEAT No. :

P5034

[Total No. of Pages : 2

[6187]-434
T.E. (Electrical Engineering) (Insem)
POWER ELECTRONICS
(2019 Pattern) (Semester - I) (303142)

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

Instructions to the candidates:

1) ***Solve Q.1 or Q.2, Q.3 or Q.4.***
2) ***Figures to the right indicate full marks.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Assume suitable additional data if, necessary.***
5) ***Use of non-programmable calculator is allowed.***

Q1) a) Draw and explain constructional details of SCR and GTO, specify constructional difference between them. **[7]**

b) What is commutation of SCR? Explain class 'C' and 'D' commutation with the help of necessary circuit and waveforms. **[8]**

OR

Q2) a) With the help of constructional diagram, explain construction and working of TRIAC. **[7]**

b) Draw the dynamic characteristics of SCR and define all related time spans for switching ON. **[8]**

Q3) a) Explain the working of calss 'D' chopper with appropriate waveforms to demonstrate its operation in first and fourth quadrants. Indicate the range of duty cycle for which it operates in first and fourth quadrants. **[7]**

b) What is "Duty Cycle Control" of a chopper? How PWM and FM control is used? Compare. **[8]**

OR

P.T.O.

Q4) a) A step-up chopper has an input voltage of 150V. The voltage output needed is 450V. Given that the thyristor has a conducting time of 150μseconds. Calculate the chopping frequency. If T_{ON} is halved, keeping chopping frequency constant, what will be output voltage. **[7]**

b) Draw output and transfer characteristics of MOSFEFT and explain the terms: **[8]**

i) Pinch off voltage

ii) Threshold voltage

iii) Trans conductance

iv) Turn on & turn off characteristics