Total No. of Questions : 4]

SEAT No. : ____

PA-10059

[Total No. of Pages : 2

[6009]-346

T.E. (E &TC Engineering) (Insem)

POWER DEVICES & CIRCUITS

(2019 Pattern) (Semester-II) (304194)

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

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4.***
2) ***Neat diagrams and waveforms must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Use of nonprogrammable calculator is allowed.***
5) ***Assume Suitable data if necessary.***

Q1) a) With the help of construction diagram, Explain the working of SCR. Why it is called as controlled rectifier. **[8]**

b) Explain with neat diagram the turn on and turn off characteristics of SCR. Write down equation for turn on and turn off time. **[7]**

OR

Q2) a) Explain with neat diagram the working of power MOSFET. Draw steady state characteristics of it and explain same. **[8]**

b) Explain isolated gate drive circuit for MOSFET and explain its operation. **[7]**

Q3) a) Explain operation of single phase full converter for R load with neat circuit diagram and relevant waveforms. **[8]**

b) A single phase half controlled bridge rectifier supplies a ripple free load current of 10 A and operates from the 110V, 60Hz mains. If the average o/p voltage is 75V, **[7]**

Calculate:

i) Firing angle

ii) RMS o/p voltage

iii) RMS supply current

iv) RMS 7^{th} Harmonic supply current

OR

P.T.O.

Q4) a) Draw the circuit diagram of three phase fully controlled converter with R load. Draw load current and load voltage waveforms with $\alpha=60^{o}$ and 90^{o}. **[8]**

b) A three phase full converter operated from three phase star connected 208 V, 60 Hz supply with R load of 10 ohm. It is required to obtain 50% of maximum possible output voltage. **[7]**

Calculate:

i) Delay angle α

ii) rms and average currents (Technical Pg2-81 Ex 2.8.3)

❖ ❖ ❖