

Total No. of Questions : 4]

SEAT No. :

PD125

[Total No. of Pages : 1

[6410]-447

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

- Q1)** a) Explain steady state characteristics of IGBT. [6]
b) Draw & explain operation 2 transistor analogy of SCR? [6]
c) Compare power MOSFET with IGBT. [3]

OR

- Q2)** a) Explain any 4 requirements of gate triggering circuit for SCR. [4]
b) Draw and explain gate drive circuit for power MOSFET. [5]
c) Draw & explain switching characteristics of power MOSFET? [6]

- Q3)** a) Draw & explain single phase semi-converter for R load with voltage & current waveforms? Derive an expression for its average output voltage? [9]
b) Draw single phase full converter for R-L load, also draw output voltage & current waveforms for $\alpha < 90^\circ$ & $\alpha > 90^\circ$. [6]

OR

- Q4)** a) Draw & explain three phase fully controlled converter with R load with circuit diagram & waveforms. [9]
b) A single phase full converter is operated from the 120V, 60Hz AC input supply. Converter supplies an inductive load. Output current is continuous and ripple free. If the firing angle is 30 degree. Calculate: [6]
i) Average o/p voltage
ii) rms o/p voltage
iii) If a freewheeling diode (FWD) is connected across inductive load in above full converter, calculate new average o/p voltage.

