

314363

24225

3 Hours / 70 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
(2) Illustrate your answers with neat sketches wherever necessary.
(3) Figures to the right indicate full marks.
(4) Assume suitable data, if necessary.
(5) Use of Non-programmable Electronic Pocket Calculator is permissible.
(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following : 10
- a) Draw the symbols of LASCR and GTO.
 - b) Define holding and latching current.
 - c) Compare VI characteristics of LASCR and SCR.
 - d) List triggering methods of SCR.
 - e) List commutation methods of SCR.
 - f) Define firing angle and conduction angle.
 - g) Draw proximity detector using SCR.

P.T.O.

- 2. Attempt any THREE of the following :** **12**
- a) Describe the working of power MOSFET with its VI characteristics.
 - b) Describe the working of Class C commutation with waveform.
 - c) Draw the circuit diagram of single phase H.W.C. Rectifier with “R” load. Explain the working with waveforms.
 - d) Define the performance parameters of inverters.
- 3. Attempt any THREE of the following :** **12**
- a) Describe VI characteristics of IGBT with construction and symbol.
 - b) Describe R Triggering method used for SCR.
 - c) Draw full-wave controlled rectifier with R-L load with Free wheeling diode. Explain the effect of free wheeling diode on the circuit with output voltage waveforms.
 - d) Describe the working of step down chopper using IGBT with a neat circuit diagram.
- 4. Attempt any THREE of the following :** **12**
- a) Compare characteristics of DIAC and TRIAC.
 - b) Why protection circuits are required for SCR. Draw the circuits.
 - c) Explain the operation of three phase half wave controlled rectifier with circuit diagram and also sketch its input and output waveform.
 - d) Draw block diagram of SMPS and state function of each block.
 - e) Describe with circuit diagram the operation of the battery charger using SCR.

5. Attempt any TWO of the following :**12**

- a) Draw and explain VI characteristics of SCR. What is the effect of gate current on VI characteristics?
- b) Draw the circuit diagram of a semi converter with R load. A single phase full wave controlled rectifier is supplied with a voltage $V=200 \sin(314t)$, $\alpha = 60^\circ$ and load resistance is 100Ω . Find the average output DC voltage and load current.
- c) Suggest the suitable type of inverter to produce square wave output and Explain its operation with neat diagram. Define Distortion factor.

6. Attempt any TWO of the following :**12**

- a) Describe UJT relaxation oscillator used for SCR, compare it with PUT relaxation oscillator
 - b) Compare online and offline UPS systems with block diagrams.
 - c) Give classification of cyclo-converter. Describe working principle of single phase cyclo-converter with R load.
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