

22427

12526

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) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

- 1. Attempt any FIVE of the following :** **10**
- Define holding and latching current.
 - List different turn off methods of SCR.
 - Define chopper. State its types.
 - Draw the symbol of IGBT and PUT.
 - State the use of freewheeling diode in controlled rectifier.
 - List two application of inverter.
 - Draw the basic block diagram of UPS.

P.T.O.

- 2. Attempt any THREE of the following :** **12**
- a) Describe with neat sketch the V-I characteristics of TRIAC.
 - b) Name the suitable chopper to decrease the output voltage and also explain its operation with neat circuit diagram.
 - c) A single phase full wave controlled rectifier is supplied with a voltage $V = 230 \sin 314 t$. If firing angle ' α ' is 30° .
Find –
 - i) Average dc o/p voltage.
 - ii) Load current for the load resistance of 100Ω .
 - d) Explain with circuit diagram the operation of emergency lighting system.
- 3. Attempt any THREE of the following :** **12**
- a) Compare R-triggering and RC-triggering of SCR.
(Any four points)
 - b) Explain with circuit diagram and waveform the operation of single phase center tapped full wave controlled rectifier with R load.
 - c) Describe with circuit diagram the operation of battery charger using SCR.
 - d) Suggest the suitable type of inverter to produce square wave output and Write its operation with neat diagram.
- 4. Attempt any THREE of the following :** **12**
- a) List different turn on method of SCR and Explain any one in details.
 - b) Draw circuit diagram of three phase half-wave controlled rectifier with resistive load.
 - c) Draw circuit diagram of step up chopper. State its output voltage expression and draw its input output waveforms.
 - d) Describe the working of light dimmer using DIAC-TRIAC.
 - e) Explain class-B commutation with neat circuit diagram.

- 5. Attempt any TWO of the following :** **12**
- a) Explain with sketch the operation of power MOSFET.
 - b) State the need of protection circuit of SCR describe the working of snubber circuit with neat diagram.
 - c) Draw half-wave controlled rectifier with R-L load with free-wheeling diode. Explain the effect of freewheeling diode on the circuit with output voltage waveforms.
- 6. Attempt any TWO of the following :** **12**
- a) Explain the working of series inverter with labelled circuit diagram. Draw its Input-Output waveforms and state its two applications.
 - b) Explain with the characteristics the effect of gate current on break over voltage of SCR. Draw two transistor analogy circuit diagram of SCR.
 - c) Suggest a suitable two terminal power device having 1st and 3rd quadrant symmetrical characteristics and describe it's operation with modes.
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