

22427

21819

3 Hours / 70 Marks

Seat No.

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- Instructions* –
- (1) All Questions are *Compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.
 - (5) Assume suitable data, if necessary.
 - (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (7) 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) Define holding and latching current.
 - b) Draw the symbols of IGBT and PUT.
 - c) List different turn-on methods of SCR.
 - d) State the use of freewheeling diode in controlled rectifier.
 - e) List two applications of inverter.
 - f) Define Chopper. State its types.
 - g) 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) Describe with circuit diagram the operation of battery charger using SCR.
 - c) Name a suitable chopper to decrease the output voltage and also explain its operation with neat circuit diagram.
 - d) Explain with circuit diagram and wave form the operation of single phase centre tapped full wave controlled rectifier with R load.
- 3. Attempt any THREE of the following:** **12**
- a) Explain class B commutation with neat circuit diagram.
 - b) A single phase full wave controlled rectifier is supplied with a voltage $V = 230 \sin 314t$. If firing angle ' α ' is 30° . Find:
 - (i) Average dc output voltage
 - (ii) Load current for the load resistance of 100Ω
 - c) Draw circuit diagram of step up chopper. State its output voltage expression and draw its input output waveforms.
 - d) Explain with circuit diagram the operation of emergency lighting system.
- 4. Attempt any THREE of the following:** **12**
- a) Explain with circuit diagram the operation of Class-C commutation.
 - b) Describe the operation of single phase half wave controlled rectifier with RL load.
 - c) Explain operation of series inverter with neat circuit diagram and waveform.
 - d) Draw and explain the block diagram of SMPS.
 - e) Compare R-triggering and RC-triggering of SCR (any four points).

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

- a) Explain with sketch the operation of power MOSFET.
- b) Describe the operation of PUT as relaxation oscillator.
- c) Explain the operation of three phase half wave controlled rectifier with circuit diagram and also sketch its input and output waveform.

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

- a) Explain with a neat circuit diagram the operation of parallel inverter.
 - b) Explain with characteristics the effect of gate current on break over voltage of SCR.
 - c) Draw labelled constructional diagram for GTO and describe its working principle with V-I characteristics.
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