22427

23124

3 Hours / 70 Marks Seat No. | | | | | | | | |

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

Marks

1. Attempt any FIVE : **2 × 5 = 10**

(a) State any two applications of Power MOSFET.

(b) Draw the symbol of UJT and TRIAC.

(c) Define commutation and state its types.

(d) Sketch the circuit diagram of series inverter.

(e) Draw the block diagram of SMPS.

(f) State two advantages of Class-C commutation.

(g) Define firing angle and conduction angle.

2. Attempt any THREE : **3 × 4 = 12**

(a) Draw and explain V-I characteristics of DIAC.

(b) Describe the operation of a Emergency lighting system with neat diagram.

(c) With a neat diagram, explain the operation of step-up chopper.

(d) Draw and explain Class-C complementary commutation circuit.

3. Attempt any THREE : **3 × 4 = 12**

(a) Draw the circuit diagram of 1ϕ half wave Rectifier with 'R' Load. Explain the working with waveforms.

(b) Explain the PUT as a relaxation oscillator.

(c) Draw and explain the operation of a light dimmer circuit using TRIAC & DIAC.

(d) Name a suitable chopper to increase the output voltage and explain its operation with neat circuit diagram.

4. Attempt any THREE : **3 × 4 = 12**

(a) Draw and explain two transistor analogy of SCR.

(b) A single phase full wave controlled rectifier is supplied with a voltage V = 100 sin (314t), $\alpha = 30°$ and load resistance is 50 Ω. Find the average output, DC voltage and load current.

(c) Draw the circuit diagram of single phase centre tapped full wave Rectifier with 'R' load. Explain the working with waveforms.

(d) Draw and explain the block diagram of On-line UPS.

(e) Draw the constructional details of GTO. Explain its working principle.

5. Attempt any TWO : **2 × 6 = 12**

(a) Draw the constructional details of power transistor and explain its V-I characteristics and give its application.

(b) Explain the operation of three phase half wave controlled rectifier with circuit diagram. Draw I/p and o/p waveforms.

(c) Explain the operation of parallel inverter with neat sketch. Draw the waveforms.

6. Attempt any TWO : **2 × 6 = 12**

(a) (i) Define Chopper. State its classification.

(ii) Compare step-down and step-up Chopper (any four points).

(b) (i) Draw neat labelled diagram of V-I characteristics of SCR.

(ii) Explain the effect of gate current on turn on voltage of SCR.

(c) State the need of protection circuit of SCR. Describe the working of snubber circuit with neat diagram.