17444

16117

3 Hours / 100 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) 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. a) **Attempt any SIX of the following:** **12**

(i) Draw symbols of SCS and SUS.

(ii) State any two advantages of power MOSFET.

(iii) Define holding current (I_H) and Latching current (I_L) of SCR.

(iv) Give classification of Inverter.

(v) State the importance of pulse transformer in triggering circuit.

(vi) List any two applications of chopper.

(vii) State the need of Polyphase Rectifier.

(viii) Draw circuit diagram of light dimmer using DIAC-TRIAC.

Marks

b) **Attempt any TWO of the following:** **8**

(i) Compare single phase half wave and three phase half wave uncontrolled Rectifiers based on.

1) No. of diodes

2) Output power

3) Ripple present in output

4) Output voltage waveform

(ii) Define four performance parameters of an inverter.

(iii) With the help of neat diagram explain operation of temperature controller using SCR.

2. Attempt any FOUR of the following: **16**

a) Describe working of single phase centre tapped full wave controlled Rectifier with Resistive load.

b) With the help of circuit diagram and waveforms explain step down chopper using power MOSFET.

c) Draw block diagram of UPS. Explain each block in detail.

d) Draw VI characteristics of SCR. State the effect of increasing gate current of SCR.

e) What are different Turn ON methods of SCR? Explain dv/dt triggering.

f) Describe working of single phase half bridge inverter with help of neat circuit diagram and waveforms.

3. Attempt any FOUR of the following: **16**

a) Compare UJT and DIAC w.r.t.

(i) symbol

(ii) layer diagram

(iii) operating quadrant

(iv) application

Marks

b) Draw circuit diagram, input and output waveforms for single phase half controlled Rectifier with RL load.

c) Define following w.r.t. GTO.

(i) Maximum controllable Anode current

(ii) Turn off gain.

d) Draw neat labeled characteristics of power transistor. Show its regions.

e) Define firing angle (α) and conduction angle (θ). State effect of changing firing angle (α) on output voltage of Rectifier.

f) A single phase full wave controlled Rectifier is supplied with a voltage V_S = 300 sin (314 t). Find average output voltage and current if firing angle is 60° and load resistance is 500Ω.

4. Attempt any FOUR of the following: **16**

a) With the help of circuit diagram and waveform explain set-up chopper.

b) Explain four modes of operation of TRIAC with neat constructional diagram.

c) Draw block diagram of SMPS. State its advantages over linear regulators.

d) What is commutation? Explain class C commutation with neat diagram.

e) Describe working of emergency lighting system with neat circuit diagram.

f) Compare step up and step down chopper based on

(i) Position of chopper switch

(ii) Output voltage

(iii) Expression of output voltage

(iv) Application

Marks

5. Attempt any FOUR of the following: **16**

a) Draw circuit diagram of low power DC flasher. List any two applications.

b) Describe constructional details of PUT. Why it is called programmable?

c) Draw circuit diagram of three phase half wave controlled Rectifier. Draw its input and output voltage waveforms.

d) Explain RC triggering of SCR with neat circuit diagram.

e) Draw neat labeled construction of IGBT. State any two advantages.

f) Compare Uncontrolled and Controlled Rectifiers (Any four points)

6. Attempt any FOUR of the following: **16**

a) Explain operation of Electronic timer using SCR. Give any two applications.

b) Describe working of fully controlled bridge rectifier with RL load.

c) What is class B commutation? Explain its operation with neat diagram.

d) Draw layered diagram of LASCR. What is the effect of increasing intensity of light? State any two applications.

e) Compare power transistor and power MOSFET w.r.t.

(i) symbol

(ii) switching speed

(iii) $S10_2$ layer

(iv) on state loss

f) Draw circuit digram of UJT Relaxation oscillator. Draw output waveform and give expression for frequency of oscillation.
