



17584

16117

3 Hours / 100 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**.*

Marks

1. Attempt **any ten** :

20

- Define holding current and latching current of SCR.
- Draw the symbols of GTO, SUS, LASCR, IGBT.
- State the applications of SCR.
- Classify controlled converters.
- State the need of inverters.
- List different type of choppers.
- State the basic principle of SMPS.
- List the various triggering methods of SCR.
- State the function of freewheeling diode in converters.
- List the applications of converters.
- State different methods of commutation of choppers.
- Define firing angle and conduction angle.

2. Attempt **any four** :

16

- Draw the two transistor analogy of SCR and explain.
- Describe gate triggering of SCR with neat diagram.
- Draw the VI characteristics of IGBT. Explain the working principle.
- State methods of reducing harmonics in inverter circuit. Describe OTT filter method.
- Draw circuit diagram of automatic street lighting.
- List types of batteries used for UPS. Write any four applications of UPS.

P.T.O.

**3. Attempt any two :**

- a) Draw the circuit diagram of single phase fully controlled half wave converter with RL load. Explain with waveforms.
- b) Draw the circuit diagram of bridge inverter and explain its working.
- c) Draw the three phase fully controlled bridge converter with R load. Explain with waveforms.

4. Attempt any four :**16**

- a) Draw the VI characteristics of TRIAC and explain.
- b) Explain the pulse triggering of SCR.
- c) Explain the effect of source impedance on converter operation.
- d) Draw the basic series inverter and explain.
- e) Draw the circuit diagram of class B chopper and explain.
- f) Draw the block diagram of SMPS and explain.

5. Attempt any four :**16**

- a) Draw the circuit diagram of parallel inverter and explain.
- b) Explain the necessity of control of output voltage w.r.t. inverters.
- c) Differentiate between series and parallel inverter (any 4 points).
- d) Give the selection criteria for single phase inverters.
- e) Give the selection criteria for UPS.
- f) Explain electric welding control and explain with diagram.

6. Attempt any four :**16**

- a) Draw the circuit diagram of Class D chopper and explain.
 - b) Explain induction heating control with diagram.
 - c) Draw the circuit diagram of battery charger and explain.
 - d) Draw the circuit diagram of load commutation technique of chopper and explain.
 - e) Draw the block diagram of UPS and explain.
 - f) Explain the types of UPS with diagrams.
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