

22427

23242

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.
 - (8) Use of steam tables, logarithmic, Mollier's chart is permitted.

Marks

1. Attempt any FIVE of the following :

10

- (a) Draw the symbols of SUS & SCS.
- (b) Define holding current and latching current w.r.t. SCR.
- (c) List turn ON methods of SCR.
- (d) Give two functions of freewheeling diode used in controlled rectifier.
- (e) Define converter and state its types.
- (f) List the types of choppers.
- (g) Draw light dimmer circuit using DIAC and TRIAC.



- 2. Attempt any THREE of the following : 12**
- (a) Draw the constructional diagram and VI characteristics of power MOSFET.
 - (b) Explain with block diagram the concept of SMPS.
 - (c) Describe the working of step up chopper with circuit diagram.
 - (d) Describe the working of half wave controlled rectifier with RL load circuit diagram and waveform.
- 3. Attempt any THREE of the following : 12**
- (a) Describe PUT relaxation oscillator used in triggering of SCR. How it is different from UJT relaxation oscillator ?
 - (b) Draw the circuit diagram and waveform of three phase half wave controlled rectifier.
 - (c) Describe with circuit diagram the working of series inverter.
 - (d) Describe the working of battery charger with circuit diagram.
- 4. Attempt any THREE of the following : 12**
- (a) Describe the working of RC triggering circuit with circuit diagram and waveform.
 - (b) Describe the working of full wave controlled rectifier with R load.
 - (c) Describe the working of step down chopper using power MOSFET.
 - (d) Describe with circuit diagram, emergency lighting system using SCR.
 - (e) Describe the working of Class C commutation with circuit diagram and waveform.

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

- (a) Compare SUS and SBS w.r.t. construction, working principle and VI characteristics.
- (b) State the need of protection circuit of SCR. Describe the working of snubber circuit with circuit diagram.
- (c) Define firing angle and conduction angle.

A single phase half wave controlled rectifier supplied with voltage

$$V = 200 \sin 314 t$$

$$\alpha = 30$$

load resistance is 100Ω

Find Average output DC voltage and load current.

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

- (a) Describe the working of parallel inverter with neat circuit diagram and waveform.
 - (b) Describe VI characteristics of SCR. What is the effect of gate current on break-over voltage.
 - (c) Describe with constructional details bidirectional working of TRIAC. Draw its VI characteristics.
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