

313335

12425

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 :
 - (i) Latching current
 - (ii) Holding current
- (b) Draw the symbol of IGBT and MOSFET.
- (c) List the turn-ON methods of SCR.
- (d) Define :
 - (i) Firing angle
 - (ii) Conduction angle
- (e) Define :
 - (i) Duty cycle
 - (ii) Chopping period w.r.t. chopper



- (f) State the applications of photovoltaic cell (any 2).
- (g) List any two applications of chopper.

2. Attempt any THREE of the following : 12

- (a) Describe the constructional details of power MOSFET with a neat diagram.
- (b) Explain the operation of R triggering with neat circuit diagram.
- (c) Explain the operation of single phase fully controlled bridge rectifier with R-load.
- (d) Describe light triggering method of SCR.

3. Attempt any THREE of the following : 12

- (a) Explain $\frac{dv}{dt}$ protection circuit for SCR.
- (b) Compare Half and Full converter (any 4 points).
- (c) Explain class A commutation with suitable circuit diagram.
- (d) Draw a neat circuit diagram of 1ϕ half controlled rectifier with R-L load. Write its operation.

4. Attempt any THREE of the following : 12

- (a) Explain with neat circuit operation of 1ϕ full bridge inverter with R-L load.
- (b) Draw the circuit diagram of pulse width modulator. Explain the working principle and draw the output waveforms.
- (c) Explain operation of step-up chopper with neat circuit diagram.
- (d) Describe the working of speed control of ceiling fan using TRIAC.
- (e) Describe a solar power system with block diagram.

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

- (a) Draw the symbol and labelled V-I characteristics of following devices :
 - (i) SCR
 - (ii) TRIAC
 - (iii) IGBT
- (b) Explain with neat circuit diagram and waveforms RC triggering method of SCR.
- (c) Draw a neat circuit diagram and waveforms for half converter with R-L load and free wheeling diode. Explain its working.

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

- (a) Draw and explain V-I characteristics of SCR. List any two applications of SCR.
 - (b) Describe with neat circuit and waveforms of 1- ϕ Half bridge inverter with R-load.
 - (c) Describe working of step-down chopper with neat circuit diagram and waveforms. Also write formula for O/P voltage.
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