

22326

11920

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.

	Marks
1. Attempt any FIVE of the following :	10
(a) Define (i) Holding current, (ii) Latching current of SCR.	2
(b) Draw circuit diagram of Class B commutation.	2
(c) State classification of Phase controlled rectifiers.	2
(d) Define (i) Conduction angle, (ii) Firing angle.	2
(e) Draw circuit diagram of symmetrical configuration of bridge converter.	2
(f) State the advantages of SMPS. (any two)	2
(g) State the need of UPS.	2
2. Attempt any THREE of the following :	12
(a) Describe with neat sketch the constructional details of IGBT.	4

- (b) Explain two transistor analogy of SCR with neat diagram. 4
- (c) With neat diagram explain synchronized UJT triggering circuit. 4
- (d) Explain working of static A.C. circuit breaker. 4
- 3. Attempt any THREE of the following : 12**
- (a) Give comparison of SCR & TRIAC. (any four points) 4
- (b) Explain the thermal triggering method of SCR. Enlist different triggering methods of SCR. 4
- (c) Draw single phase full wave mid-point converter for inductive load. Draw input and output waveforms for it. 4
- (d) Draw the circuit diagram of battery charger using SCR and explain it's working. 4
- 4. Attempt any THREE of the following : 12**
- (a) Draw I-V characteristics of power transistor. Show different regions. 4
- (b) With reference to GTO answer the following : 4
- (i) State advantage of GTO over SCR.
- (ii) Draw construction of GTO.
- (c) Explain triggering of SCR using opto-coupler. State its advantages. 4
- (d) Describe the operation of single phase fully controlled bridge converter with R-load. 4
- (e) Explain the working principle of SMPS with neat diagram. 4

- 5. Attempt any TWO of the following : 12**
- (a) With neat sketch explain four modes of operation of a TRIAC. 6
 - (b) Explain with neat circuit diagram and input output waveforms, single phase half wave converter with R-L load. Give significance of freewheeling Diode. 6
 - (c) Describe working of online UPS. List any two applications of UPS. 6
- 6. Attempt any TWO of the following : 12**
- (a) Draw symbols and V-I characteristics of the following devices : 6
 - (i) LASCR (ii) DIAC
 - (iii) PUT (iv) SCS
 - (b) For a class D commutation, answer the following : 6
 - (i) Explain the operation with a circuit diagram.
 - (ii) Interpret with waveforms.
 - (c) A 1- ϕ half controlled rectifier supplied with voltage $V = 300 \sin 314 t$, and load resistance is 100Ω . Find : 6
 - (i) Average output DC voltage.
 - (ii) Load current.(For $\alpha = 60^\circ$ and $\alpha = 100^\circ$)
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