

17541

16172

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.

Marks

1. (A) Attempt any THREE of the following :

12

- (i) State the reason of unequal voltage distribution in case of series connection of SCR. What is remedy ?
- (ii) List different types of inverter. State any two applications of inverter.
- (iii) Describe operation of class B chopper with the help of neat diagram.
- (iv) Compare relay type and tap changing phase control type voltage stabilizers with respect to working principle, efficiency, distortion and application.

(B) Attempt any ONE of the following :

06

- (i) Describe working of class C chopper using SCRs, with circuit diagram and waveforms.
- (ii) State operating principle of basic series inverter using circuit diagram & waveforms.

2. Attempt any TWO of the following : 16

- (a) What is the need of snubber circuit for power devices ? Explain how to protect thyristor against high dv/dt and high di/dt .
- (b) With the help of neat circuit diagram and waveforms, explain Jone's chopper. Give any two applications of it.
- (c) Draw block diagram of sequential timer for resistance welding. Describe function of each block. List different signals generated.

3. Attempt any FOUR of the following : 16

- (a) Draw circuit diagram & waveforms for parallel inverter using SCRs with purely resistive load. Describe its working.
- (b) Describe operation of Morgan's chopper with neat diagram & waveforms.
- (c) Which type of UPS is used for medical applications ? Draw related block diagram & explain operation of each block.
- (d) What are different PWM techniques to control output voltage & harmonics of a inverter ? Explain any one of them.
- (e) Draw circuit diagram & explain working of non-isolated SMPS.

4. (A) Attempt any THREE of the following : 12

- (i) What do you mean by Resonant inverter ? State any two advantages and disadvantages.
- (ii) Describe working principle of MCT with the help of neat constructional diagram.
- (iii) Compare class A and class B choppers w.r.t. position of chopper switch, output voltage, quadrant of operation, application.
- (iv) Define following battery parameters :
 - (a) Backup time
 - (b) Power rating
 - (c) Transfer time
 - (d) Typical value of each

(B) Attempt any ONE of the following :**06**

- (i) Draw symbol, construction and characteristics of SIT and FCT. Why they are called as normally ON devices ?
- (ii) With the help of neat diagram & waveforms, describe operation of mid-point cycloconverter.

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

- (a) Describe operation of isolated SMPS with the help of neat diagram. State any two advantages & disadvantages of it.
- (b) State the working principle of resistance welding. Draw block diagram of capacitor energy storage welding waveforms. State advantages & disadvantages.
- (c) Explain operating principle of servo type AC voltage stabilizer. Give any two advantages, disadvantages & applications.

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

- (a) Describe operation of line interactive UPS with help of block diagram.
 - (b) What are different types of Resistance welding ? Draw neat sketch of each type.
 - (c) Compare online and offline UPS w.r.t. output voltage waveform, transfer time, static switch & applications.
 - (d) Draw circuit diagram of McMurray full bridge inverter. Draw voltage & current waveforms across commutating capacitor.
 - (e) What is SMPS ? How is it different from linear power supplies ? State any two advantages of SMPS over linear power supplies.
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