

17541

11819

3 Hours / 100 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
  - (2) Illustrate your answers with neat sketches wherever necessary.
  - (3) Figures to the right indicate full marks.
  - (4) Assume suitable data, if necessary.

- |  | <b>Marks</b> |
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| <b>1. (A) Attempt any THREE :</b>  | <b>12</b>    |
| (a) Describe crowbar protection circuit with a neat diagram.   |              |
| (b) Define chopper. List the types of choppers on the basis of operation quadrants.  |              |
| (c) Draw a neat circuit diagram of McMurray Bedford Inverter and give its operation.   |              |
| (d) Distinguish between Relay type and Servo type stabilizer with respect to output, efficiency, distortion and application.   |              |
| <b>(B) Attempt any ONE :</b>   | <b>6</b>     |
| (a) Draw a neat circuit diagram of Jones Chopper and give its operation.   |              |
| (b) Draw a circuit diagram of full bridge inverter and give its operation. Also draw waveform for R load and RL load.  |              |
| <b>2. Attempt any TWO :</b>  | <b>16</b>    |
| (a) State the need of multiple connection of SCR. Draw a neat labelled circuit diagram of series equalising network and state the roll of static and dynamic equalising network. |              |

- (b) Draw a neat circuit diagram of Parallel Inverter and give its operation. Also draw its waveforms.
- (c) Draw a neat block diagram of resistance welding and give the function of each block.

**3. Attempt any FOUR :****16**

- (a) Describe how SCR can be protected from overvoltage with suitable labelled circuit diagram.
- (b) Draw a neat circuit diagram of non-isolated SMPS and give its operation.
- (c) Compare ON line UPS and OFF line UPS.
- (d) Draw a neat labelled diagram of line contactor using SCR and describe its working.
- (e) Draw a neat circuit diagram of Morgan Chopper and give its operation.

**4. (A) Attempt any THREE :****12**

- (a) Draw a neat circuit diagram of Class-B chopper and give its operation.
- (b) Draw a neat diagram of servo type stabilizer and give its operation.
- (c) Give the operating principle of MCT with suitable equivalent circuit.
- (d) Compare Series and Parallel Inverter.

**(B) Attempt any ONE :****6**

- (a) Draw the basic circuit diagram for the following and also give its operation :
  - (i)  $di/dt$  protection circuit
  - (ii)  $dv/dt$  protection circuit
- (b) Draw a neat circuit diagram of series inverter and give its operation. Also draw its waveforms.

**5. Attempt any TWO :****16**

- (a) Draw a neat circuit diagram of push-pull SMPS and give its operation.
- (b) Draw a block diagram of capacitor energy storage welding system and give its operation. State also any two advantages and two disadvantages of the system.
- (c) Draw a neat diagram of relay type stabilizer and give its operation. Also state advantages, disadvantages and applications.

**6. Attempt any FOUR :****16**

- (a) Draw the symbols of SIT, MCT and FCT. Also give the features of FCT.
  - (b) State the requirements of SMPS over linear regulator. State also any four applications.
  - (c) Describe battery parameters – backup time, power rating with its typical values.
  - (d) Draw the block diagram of sequential timer for resistance welding and give the function of each block.
  - (e) Draw the block diagram of ON line UPS and give the function of each block.
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