



17541

21415

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.
(5) **Assume** suitable data, **if necessary**.
(6) Preferably, write the answer in sequential order.

MARKS

1. A) Attempt **any three** : **12**
- a) Draw circuit symbol of SIT, FCT and MCT. List any one advantage of each.
 - b) Classify choppers on the basis of operation of quaderent. Explain how to obtain variable dc voltage from fixed dc.
 - c) Draw circuit of parallel inverter using SCRs, with RL load. Draw load current and load voltage waveforms.
 - d) Distinguish between solid state and servo stabilizer with respect to operating principle, efficiency and application.
- B) Attempt **any one** : **6**
- a) Describe working of four quadrant chopper with circuit diagram. List its applications.
 - b) Draw series inverter circuit using SCRs. What are its disadvantages ? Draw modified series inverter and explain its working.
2. Attempt **any two** : **16**
- a) State the need of series and parallel connections of SCR. Draw neat labeled circuit of three SCR's connection in series. Describe the roll of static and dynamic equalization network.
 - b) With the help of circuit diagram and waveforms, explain Mc-Murray Bed Ford full bridge inverter.
 - c) Draw block diagram of sequential timer for resistance welding. Describe function of each block. List different signal generated.

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3. Attempt **any four** : 16
- a) Describe Crobar protection circuit with neat diagram.
 - b) Draw block diagram of SMPS and explain operation of each block.
 - c) State necessity of UPS. What is meaning of the term Backup time and transfer time.
 - d) Draw and explain Morgan's chopper.
 - e) Draw and describe synchronous weld control circuit.
4. A) Attempt **any three** : 12
- a) Draw circuit of Jone's chopper and describe its operation.
 - b) Draw block diagram of Line Interactive UPS. Explain its operation, when mains is ON and OFF.
 - c) Explain with circuit RC polarised snubber for protection of SCR.
 - d) Draw and explain circuit of single phase cycloconverter with neat i/p and o/p waveforms.
- B) Attempt **any one** : 6
- a) How voltage suppression are achieved by selenium diode and MOV, explain with suitable circuit diagram.
 - b) What are the different types of PWM technique used to control output voltage and harmonics of inverter ? Explain it with waveforms.
5. Attempt **any two** : 16
- a) Explain need of AC voltage stabilizer. Draw block diagram of Tap changing stabilizer, describe its operation. List its applications.
 - b) State principle of resistance welding. Explain magnetic energy storage welding with wave-forms. State two advantages and disadvantages.
 - c) What are various types of non-isolated switching regulators ? Explain any one with circuit and list any two advantages and disadvantages.
6. Attempt **any four** : 16
- a) Draw and describe working of class D-chopper.
 - b) Draw and explain block diagram of phase control AC voltage stabilizer.
 - c) Draw block diagram of ON-Line UPS. Explain function of each block.
 - d) Draw circuit of line contractor using SCR, describe its operation.
 - e) Distinguish between ON Line and OFF line UPS with reference to parameter power rating, efficiency, transfer time and applications.
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