

22527

22232

3 Hours / 70 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.

Marks

1. **Attempt any FIVE of the following :** **10**
 - (a) Draw labelled transfer characteristics of Power MOSFET.
 - (b) Define Latching current of SCR.
 - (c) List any two applications of SIT.
 - (d) Write the different types of Inverter.
 - (e) State need of Inverter.
 - (f) List any two applications of cyclo converter.
 - (g) List the types of high frequency heating.

2. **Attempt any THREE of the following :** **12**
 - (a) Explain with circuit diagram the working principle of type E chopper.
 - (b) Describe the operation of three phase bridge inverter with circuit diagram.
 - (c) Explain with circuit diagram the working principle of the circulatory current free mode dual converter.
 - (d) Define duty cycle of a chopper. Explain various control techniques used in chopper.



- 3. Attempt any THREE of the following :** **12**
- (a) Explain the operation of Jones Chopper with circuit diagram.
 - (b) Describe the operation of McMurray half bridge inverter with circuit diagram.
 - (c) Describe the operation of three phase to single phase cycloconverter with neat circuit diagram.
 - (d) Explain principle of dielectric heating.
- 4. Attempt any THREE of the following :** **12**
- (a) Differentiate between type A and type B choppers.
 - (b) Identify the role of the saturable reactor in Morgan chopper. Explain with its circuit diagram.
 - (c) A DC chopper (step-down) has a resistive load $R = 10 \Omega$ and input voltage $V_S = 200 \text{ V}$. Calculate the average output voltage if duty cycle is 0.6.
 - (d) Draw input and output waveform of cycloconverter to produce $1/4^{\text{th}}$ of input frequency. Show the firing sequence of thyristors in the relevant waveform.
 - (e) Describe the operation of single phase circulatory current mode dual converter with labelled diagram.
- 5. Attempt any TWO of the following :** **12**
- (a) Describe the working of closed loop speed control method for AC servomotor.
 - (b) Identify a suitable AC voltage stabilizer that uses solid state. Describe its operation with diagram.
 - (c) Explain with neat sketch the working of DC static circuit breaker.
- 6. Attempt any TWO of the following :** **12**
- (a) Justify IGBT as a voltage controlled device with characteristics.
 - (b) Identify a suitable inverter in which load is connected in parallel with commutating components. Explain its operation with circuit diagram.
 - (c) Explain the operation of McMurray Bedford inverter with circuit diagram.
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