22527

12425

3 Hours / 70 Marks Seat No. | | | | | | | | |

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) List any two applications of SIT.

(b) Classify inverter based on the connection.

(c) Draw symbol and VI characteristics of FCT.

(d) List the types of high frequency heating.

(e) List types of Dual converter.

(f) List the control strategies used in chopper.

2. Attempt any THREE of the following : **12**

(a) Compare step up and step down chopper (any four points).

(b) Draw circuit diagram of three phase to single phase cycloconverter and draw the input/output waveform.

(c) Describe working principle of dielectric heating with suitable block diagram.

(d) Explain the operation of basic parallel inverter with circuit diagram.

3. Attempt any THREE of the following : **12**

(a) Compare Class A and class B Chopper (any four points).

(b) Identify a suitable chopper for producing the output in first and second quadrant and explain its operation.

(c) Explain the operation of single phase to single phase cycloconverter with neat diagram.

(d) Draw circuit diagram of single phase full bridge inverter with RL load and explain its operation.

4. Attempt any THREE of the following : **12**

(a) The applied DC voltage of Class A chopper is 200 V and load resistance of 50 Ω. Calculate average output voltage if duty cycle is 0.4.

(b) Explain the working principle of single phase dual converter with circulating current mode.

(c) Explain the operation of McMurray half bridge inverter with circuit diagram.

(d) Explain working principle of single phase series inverter with circuit diagram.

5. Attempt any TWO of the following : **12**

(a) Explain the operation of battery charger control with neat circuit diagram.

(b) Explain the operation of Jone's chopper with neat circuit diagram.

(c) Draw input and output waveform of cycloconverter to produce $1/5^{th}$ of input frequency. Show the firing sequence of thyristors in the relevant waveform. Also list the application of cycloconverter.

6. Attempt any TWO of the following : **12**

(a) Justify IGBT as a voltage controlled device with characteristics.

(b) Draw the circuit diagram of DC static circuit breaker and explain its operation.

(c) Explain the operation of static VAR compensation system with neat diagram.
