

22527

11920

3 Hours / 70 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) Use of Non-programmable Electronic Pocket Calculator is permissible.

Marks

1. Attempt any FIVE of the following :

10

- (a) State the applications of IGBT.
- (b) Draw symbol and V-I characteristics of power MOSFET.
- (c) Draw V-I characteristics of SCR.
- (d) List four switching components used in inverters.
- (e) List the different types of inverter.
- (f) State any two applications of dual converters.
- (g) State the applications of power electronics.

2. Attempt any THREE of the following :

12

- (a) With a neat circuit diagram, explain the working principle of Jones Chopper.
- (b) Explain with a neat labelled sketch the working principle of the single phase series inverter.
- (c) Explain the operation of cyclo converter with a neat diagram.
- (d) Draw a schematic of step up-chopper and explain it.

- 3. Attempt any THREE of the following : 12**
- (a) Draw a neat circuit diagram of class D chopper and give its operation with waveform.
 - (b) Draw a neat circuit diagram of single phase full bridge inverter with R-L load and give its operation.
 - (c) Explain with circuit diagram the working principle of the circulatory current free mode converters.
 - (d) Draw the diagram of electric welding control and describe its operation.
- 4. Attempt any THREE of the following : 12**
- (a) Differentiate between class A and class B chopper (any four points).
 - (b) Explain the control techniques of a chopper with a neat waveform.
 - (c) Explain the operation of class C chopper with neat circuit diagram. Also draw the waveform.
 - (d) Draw the circuit diagram of single phase to three phase cyclo-converter and sketch the input/output waveforms.
 - (e) Draw input and output waveforms of cycloconverter to produce $\frac{1}{4}$ th of input frequency. Show the firing sequence of thyristors in the relevant waveform.
- 5. Attempt any TWO of the following : 12**
- (a) Explain the operation of Battery charger control with a neat diagram.
 - (b) Describe the operation of close loop speed control method for AC servo motor with the help of diagram.
 - (c) Explain the operation of static VAR compensation system with a neat diagram.
- 6. Attempt any TWO of the following : 12**
- (a) With neat diagram, explain the operation of MCT and state two applications of MCT.
 - (b) Explain the operation of McMurray half bridge inverter with circuit diagram.
 - (c) Explain operation of basic parallel inverter with waveform.
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