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TE - SEM V - C3593 - PE

PE

11/12/15
QP Code : 5725

(3 Hours)

[Total Marks: 80]

N.B.:

- Question No. 1 is compulsory.
- Answer any **three** from the remaining five questions.
- Assume suitable data if necessary and justify the same.
- Figures to the right indicate the marks.

- 1 Each question carry four marks 20
- Briefly explain Latching current and holding current.
 - Compare the BJT and MOSFET.
 - List the merits and demerits of ON – OFF control.
 - What are the advantages of current source inverter over voltage source inverter?
 - What is the inversion mode of the converter?
- 2 a Explain the constructional details of IGBT with equivalent circuit and discuss its characteristics. 10
- b Sketch the gate characteristics of SCR and explain different regions of gate characteristics. Also indicate different regions, different voltages, and different currents on gate characteristics. 10
- 3 a With the necessary waveforms explain the single phase Full wave ac voltage controller with R-L load. Derive the expression for the rms output voltage. 10
- b Explain the operation of a single phase full bridge converter with RL load for continuous and discontinuous load currents. 10
- [TURN OVER]
- 4 a Write and explain the performance parameters of an inverter. 10
- b A single phase fully controlled full wave rectifier is connected to 220V, 50Hz. A load of $R=10\Omega$ is connected in series with a large inductance and load current is ripple free. If the firing angle of converter is 60° , 10

[TURN OVER]

determine (a) Rectification efficiency (b) Form factor (c) Input power factor.

- 5 a With the circuit diagram, and waveform, explain the principle of operation of dual converter, with and without circulating current. 10
- b Draw the circuit of a boost regulator and obtain an expression for the output voltage. What is the minimum inductance for continuous conduction? 10
- 6 a Draw and explain the two transistor model of a thyristor and derive an expression for the anode current in terms of the common base current gain of the transistor. 10
- b Explain with circuit diagram and waveforms, operating principle of three phase bridge inverter for 120° conduction mode. 10
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