(Time: 3 Hours) **[Total Marks: 80]**

N.B.: (1) Question No. **1** is **compulsory.**
(2) Answer any **three** from the remaining **five** questions.
(3) **Assume** suitable **data** if necessary and justify the same.
(4) **Figures** to the **right** indicate the marks.

1. (a) What is DC-DC converter? List few applications of it. **[5]**
(b) Briefly explain Latching current and Holding current. **[5]**
(c) Two transmitter analogy of SCR. **[5]**
(d) Once SCR is triggered gate loses its control. Why? **[5]**

2. (a) Define and explain any two communication circuits of SCR. **[10]**
(b) Explain the operation of a single phase full wave rectifier with RL load for continuous and discontinuous load. **[10]**

3. (a) Draw a neat circuit and explain the working of full wave fully controlled 3phase bridge circuit with resistive load. Draw the corresponding input and output voltage waveforms. **[10]**
(b) Explain with circuit diagram and waveform of 1- phase dual converter. **[10]**

4. (a) Draw and Explain 3 phase inverter where 3 switches conduct together also do the calculation of output voltage. **[10]**
(b) Define and explain a 1-phase Inverter with RL Load along with output voltage and output current wave forms and also obtained the expression. **[10]**

5. (a) Explain the step down chopper with and without CCM Mode. **[10]**
(b) A BOOST Converter has input voltage 6V. The average output voltage E_0=18 V and the average load current I_0=0.4A. The switching frequency is 20 kHz of L=250 μH and C=420μF. Determine: (a) the duty cycle $\propto$, (b) the ripple current of inductor, ΔI, (c) the peak current of inductor, I_2, and (d) the ripple voltage of filter capacitor, ΔV_c. **[10]**

6. (a) Explain in detail with circuit diagram and waveforms, single phase step down cycloconverter. **[10]**
(b) Explain the principle of ON OFF control of AC voltage controller. **[10]**

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