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SECTION C

3. Attempt any *one* part of the following: 10x1=10

a.	Describe the working of a single phase fully controlled bridge converter in the rectifying and inversion mode with the help of relevant waveform. Derive the expressions for average output voltage and rms output voltage
b.	Describe the basic working principle of single phase to single phase step down cyclo converter for both continuous and discontinuous conduction.

4. Attempt any *one* part of the following: 10x1=10

a.	A 3-phase bridge inverter is fed from a dc source of E_{dc} volts. The inverter is operated in 180° conduction mode and it is supplying a purely resistive star connected load with $R \Omega$ /phase. Determine the ratings of the transistor.
b.	Explain the working principle of mid-point converters for following loads: i. R-load ii. L-load with proper waveforms.

5. Attempt any *one* part of the following: 10x1=10

a.	Describe step down chopper? A dc chopper circuit connected to a 100V dc source supplies an inductive load having 40mH in series with a resistance of 5Ω . A freewheeling diode is placed across the load. The load current varies between the limits of 10A and 12 A. Determine the time ratio of the chopper.
b.	Explain the working principle of type-E chopper with proper circuit diagram. A four-quadrant chopper is driving a separately excited dc motor load. The motor parameters are $R=0.1 \Omega$, $L=10\text{mH}$. The supply voltage is 200V dc. If the rated current of the motor is 10A and if the motor is driving the rated torque. Determine i. Duty cycle of the chopper if $E_b=150 \text{ V}$ ii. Duty cycle of the chopper if $E_b=-110 \text{ V}$

6. Attempt any *one* part of the following: 10x1=10

a.	A single-phase full converter is feeding to a RLE load, the source voltage is 230V, 50Hz and avg. load current is 10A. For $R=0.4$ and $L=2\text{mH}$, compute i. Firing angle delay for $E=120\text{V}$ ii. Firing angle delay for $E=-120\text{V}$ iii. (I/P power factor for both parts (i) and (ii).
b.	Describe the principle of single phase a.c. voltage controller with: i. R-load ii. RL- load

7. Attempt any *one* part of the following: 10x1=10

a.	A three-phase cyclo converter feeds a single-phase load of 190 V, 45 A at a power of 0.7 lagging. Determine i. the required supply voltage ii. thyristor rating iii. power factor of the supply current
b.	Describe the dynamic turn-on and turn-off characteristic of SCR.