

- 6 a. Explain the working of single phase dual converter with neat circuit diagram. Draw relevant waveforms. (08 Marks)
- b. For the single phase bidirectional AC voltage controller, delay angles of thyristors T_1 and T_2 are equal to $\alpha_1 = \alpha_2 = \frac{2\pi}{3}$. The input is $V_s = 120\sqrt{2} \sin 314t$, 50Hz. Calculate :
- rms output voltage
 - input power factor
 - average current through thyristors I_A and
 - rms current of thyristors. (Fig. Q6(b)).

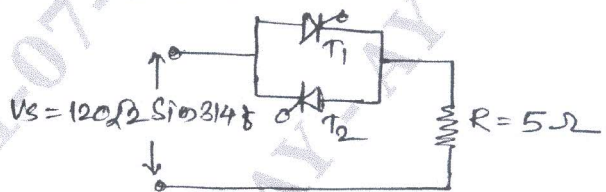


Fig.Q6(b)

(08 Marks)

- 7 a. Explain the working of stepdown chopper for resistive load with circuit diagram and waveform. Drive the expressions for average output voltage $V_{0(av)}$, rms output voltage $V_{0(rms)}$ and output power. (08 Marks)
- b. With the help of circuit diagram and waveforms explain the working of boost regulator. Derive the expression for peak to peak ripple output current and peak to peak ripple output voltage. (08 Marks)
- 8 a. Briefly explain the classification of choppers with circuit diagram, waveforms and quadrant diagram. (08 Marks)
- b. Input to the step-up chopper is 200V. The output required is 600V. If the conduction time of thyristor is $200 \mu\text{sec}$. Compute :
- Chopping frequency
 - If pulse width is halved of for constant frequency find the new output voltage. (08 Marks)
- 9 a. Explain the operation of single phase full bridge invertors supplying resistive load. Derive an expression for output RMS voltage. (08 Marks)
- b. Explain voltage control in inverter by single pulse width modulation and sinusoidal pulse width modulation. (08 Marks)
- OR**
- 10 a. With neat circuit diagram and waveforms explain transistorized current source inverter. (08 Marks)
- b. Write short note on solid state relays, and microelectronic relays. (08 Marks)
