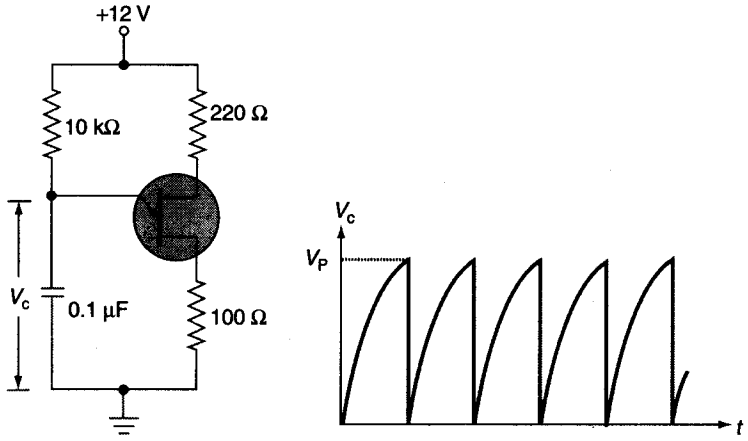

Figure 6.41 | Problem 1.

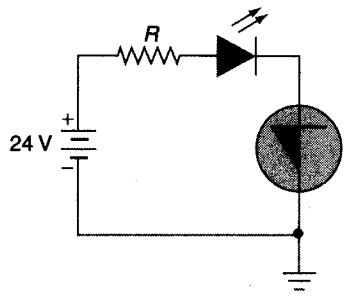

Figure 6.42 | Problem 2.

3. The PNPN diode circuit of Figure 6.43 has break-over voltage and holding current specifications of 18 V and 5 mA, respectively. The variable voltage source is set in such a way that the LED is glowing. If the knee voltage of the PNPN diode is taken to be 1.0 V and the forward-biased LED voltage drop to be 1.5 V, determine the applied voltage at which the LED will turn OFF.

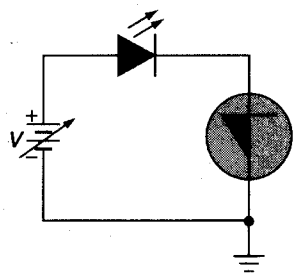

Figure 6.43 | Problem 3.

4. Refer to the relaxation oscillator circuit of Figure 6.44. The PNPN diode used in the circuit has break-over voltage and holding current specifications of 12.5 V and 5 mA, respectively. Determine the peak value and frequency of the sawtooth voltage waveform appearing across the capacitor. Assume the ON-resistance of the PNPN device to be negligible.

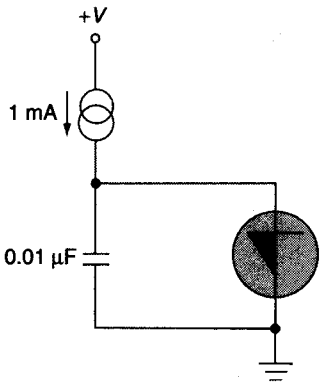

Figure 6.44 | Problem 4.

5. Refer to the SCR crowbar circuit of Figure 6.45. Determine the required breakdown voltage of the Zener diode if the load voltage could at the most be allowed to increase to 30 V. Take V_{GT} of SCR to be equal to 0.8 V.

6. Refer to the SCR-based half-wave power control circuit of Figure 6.46. The 230 V AC source of supply feeds a 200 Ω load through a controlled rectifier. If the trigger circuit of the SCR was so adjusted as to start conduction at 60° after the start of each cycle, determine (a) the RMS value of the load current and (b) the total power delivered to the load by the AC supply. Assume holding voltage of the SCR to be zero.

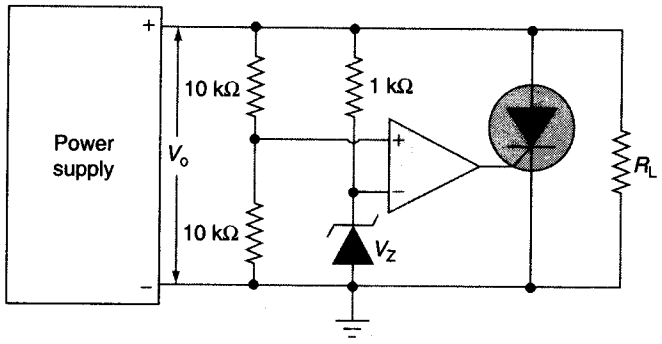

Figure 6.45 | Problem 5.

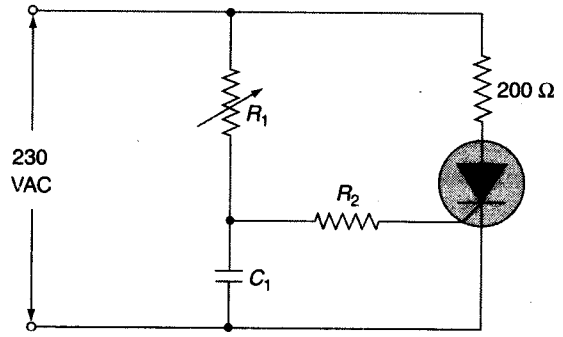

Figure 6.46 | Problem 6.

ANSWERS

Multiple-Choice Questions

1. (b)	**4.** (a)	**7.** (a)	**10.** (b)	**13.** (b)
2. (c)	**5.** (c)	**8.** (a)	**11.** (b)	**14.** (d)
3. (b)	**6.** (c)	**9.** (c)	**12.** (a)	**15.** (c)

Match the Following

(1–2–4)
(2–1–3)
(3–6–1)
(4–5–2)
(5–4–6)
(6–3–5)

Problems

1. 5.45 V
2. (a) ON; (b) OFF
3. 7.5 V
4. Peak value = 12.5 V; frequency = 8 kHz
5. 15 V
6. (a) 0.73 A, (b) 107 W