



Alexandria University

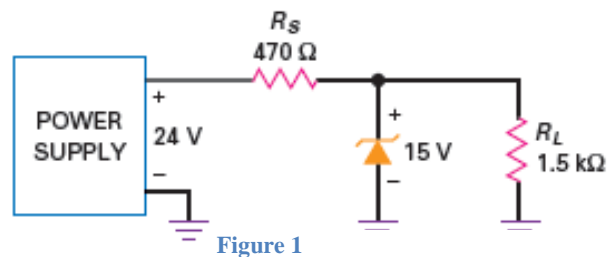
Faculty of Engineering

Electrical Engineering Department

ECE: Principles and Applications of Electronic Engineering

Sheet 3

1. An unloaded zener regulator has a source voltage of 24 V, a series resistance of 470 Ω , and a zener voltage of 15 V. What is the zener current?
2. If the source voltage in Prob.1 varies from 24 to 40 V, what is the maximum zener current?
3. If the series resistor of Prob. 1 has a tolerance of ± 5 percent, what is the maximum zener current?



4. If the zener diode is disconnected in Fig. 1, what is the load voltage?
5. Calculate all three currents in Fig. 1.
6. Suppose the supply voltage of Fig. 1 can vary from 24 to 40 V. What is the maximum zener current?
7. Draw the schematic diagram of a zener regulator with a supply voltage of 20 V, a series resistance of 330 Ω , a zener voltage of 12 V, and a load resistance of 1 k Ω . What are the load voltage and the zener current?
8. The zener diode of Fig. 1 has a zener resistance of 14 Ω . If the power supply has a ripple of 1 Vp-p, what is the ripple across the load resistor?
9. During the day, the ac line voltage changes. This causes the unregulated 24-V output of the power supply to vary from 21.5 to 25 V. If the zener resistance is 14 Ω , what is the voltage change over the foregoing range?