1. Vin is 40 V, R_1 is 50 Ω, R_L is 100 Ω and the breakdown voltage of the zener diode 12V
   (a) What is the voltage drop across the load resistance R_L?
   (b) Calculate the current through the load resistor R_L.
   (c) What is the voltage drop across R_1?
   (d) Calculate the current through R_1.
   (e) What is the current through the zener diode?

2. For the circuit shown in Fig. 2 (i),find the maximum and minimum values of zener diode current.

3. The zener diode shown in Fig. 3 has VZ = 18 V. The voltage across the load stays at 18 V as long as IZ is maintained between 200 mA and 2 A. Find the value of series resistance R so that E0 remains 18 V while input voltage Ei is free to vary between 22 V to 28V.

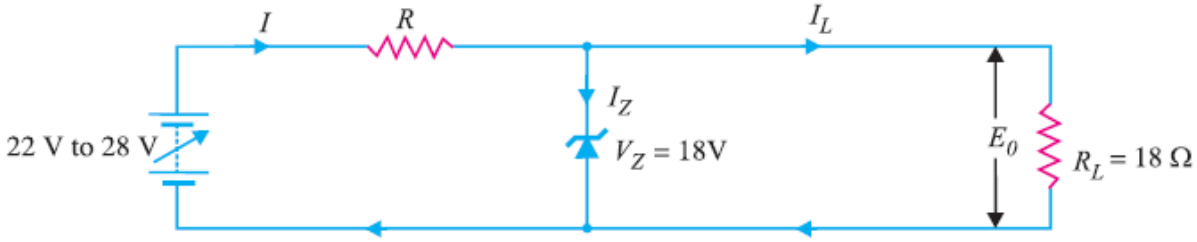


Fig. 3

4. The circuit of Fig. 6 uses two zener diodes, each rated at 15 V, 200 mA. If the circuit is connected to a 45-volt unregulated supply, determine :(i) The regulated output voltage (ii) The value of series resistance R.

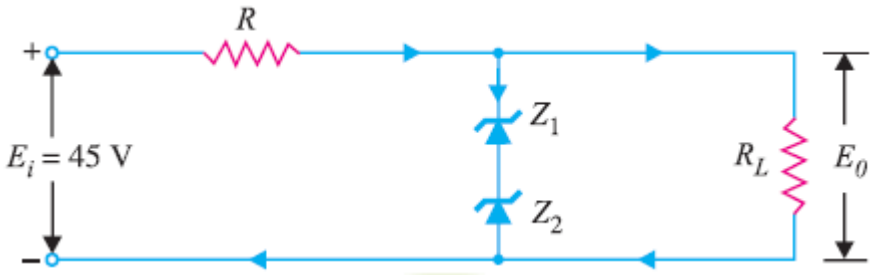
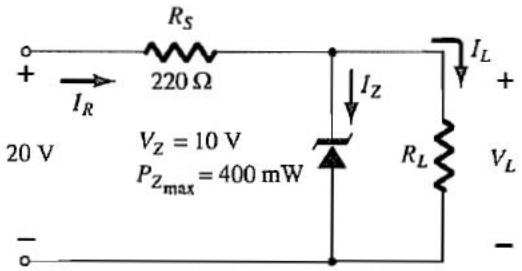


Fig. 4

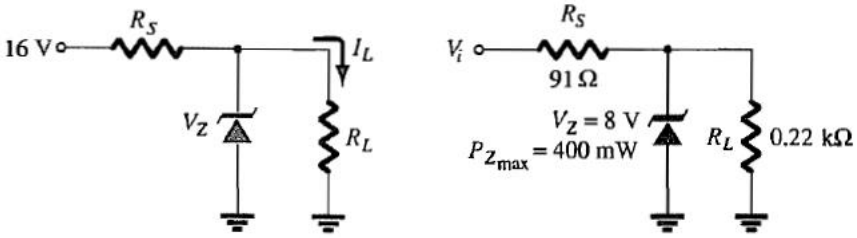
a. Determine V_L, I_L, I_Z, and I_R for the network Fig. 2.181 if $R_L = 180\ \Omega$.
b. Repeat part (a) if $R_L = 470\ \Omega$.
c. Determine the value of R_L that will establish maximum power conditions for the Zener diode.
d. Determine the minimum value of R_L to ensure that the Zener diode is in the "on" state.

5.



For the network of Fig. 2.183, determine the range of V_i that will maintain V_L at 8 V and not exceed the maximum power rating of the Zener diode.

6.



7. (a) Design the network to maintain VL at 12 V for a load variation (IL) from 0 to 200 mA. That is, determine Rs and VZ. (b) Determine P_{Zmax} for the Zener diode of part (a).