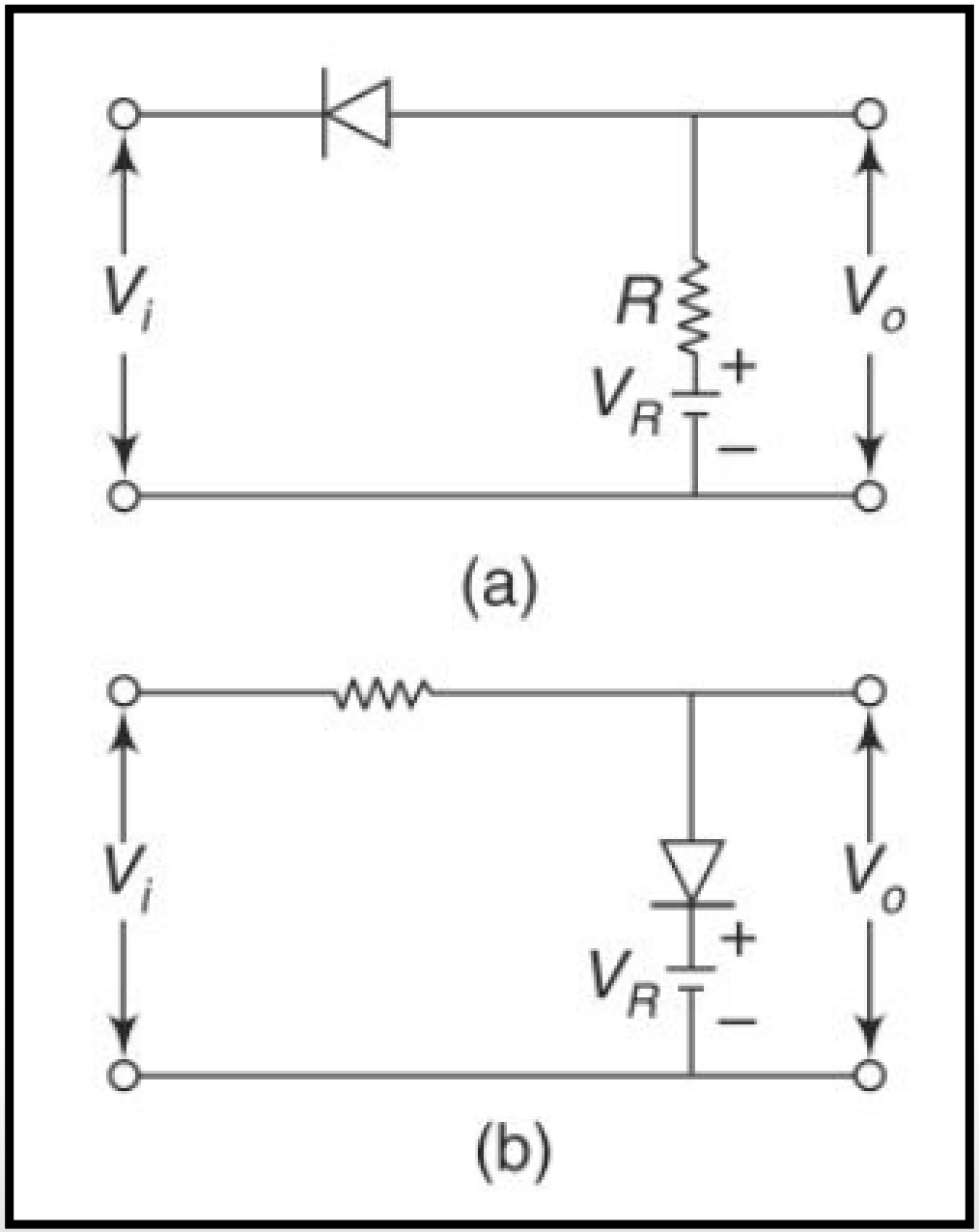
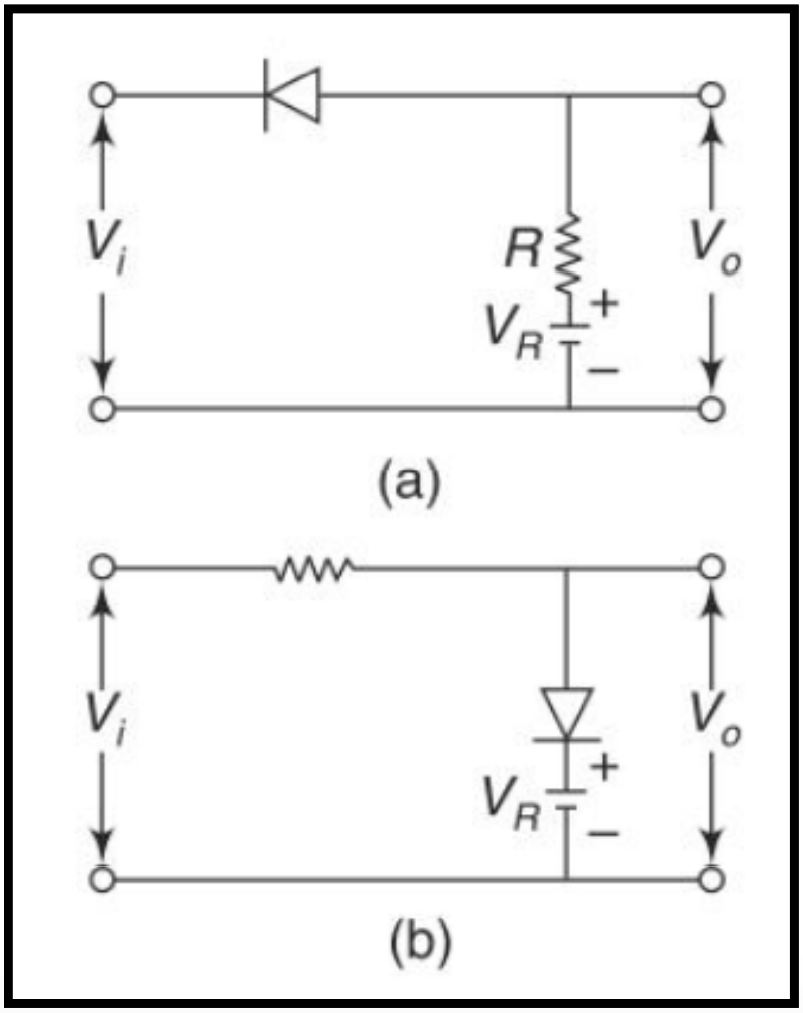
DELD – Tutorial 2

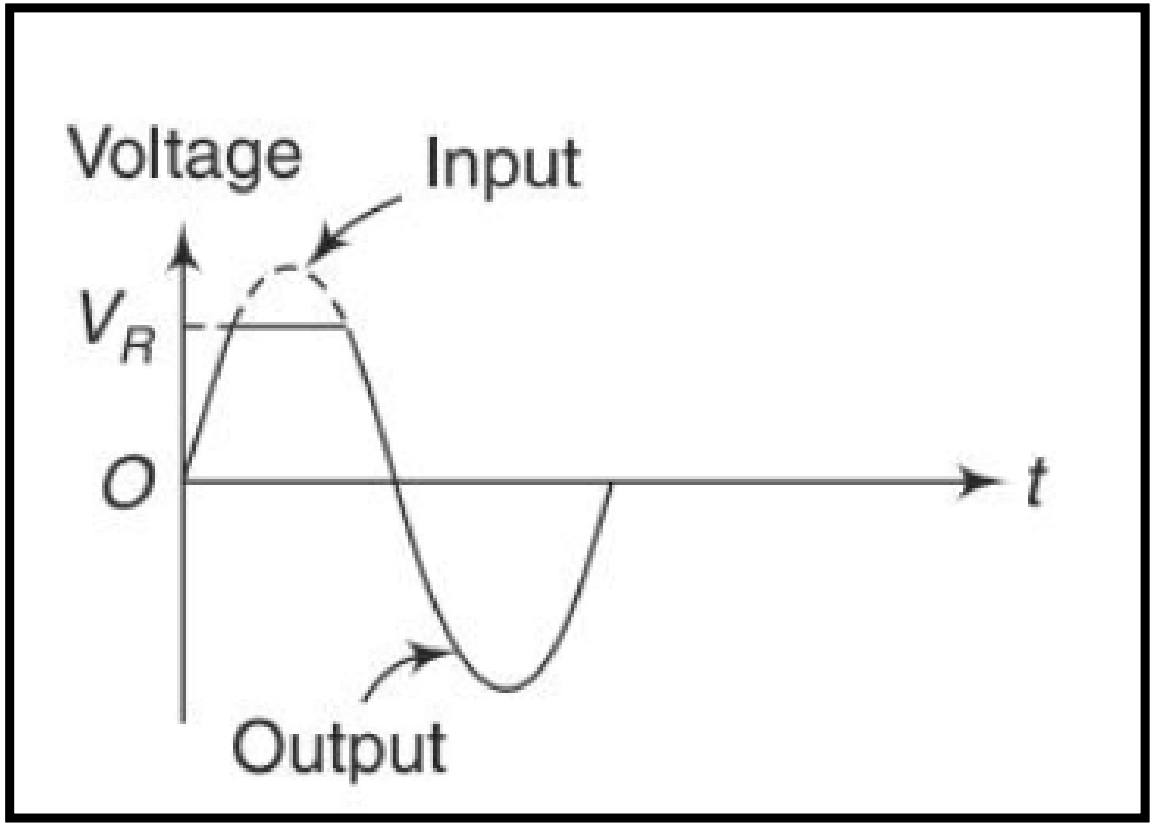
ECED SVNIT

Question



Solution





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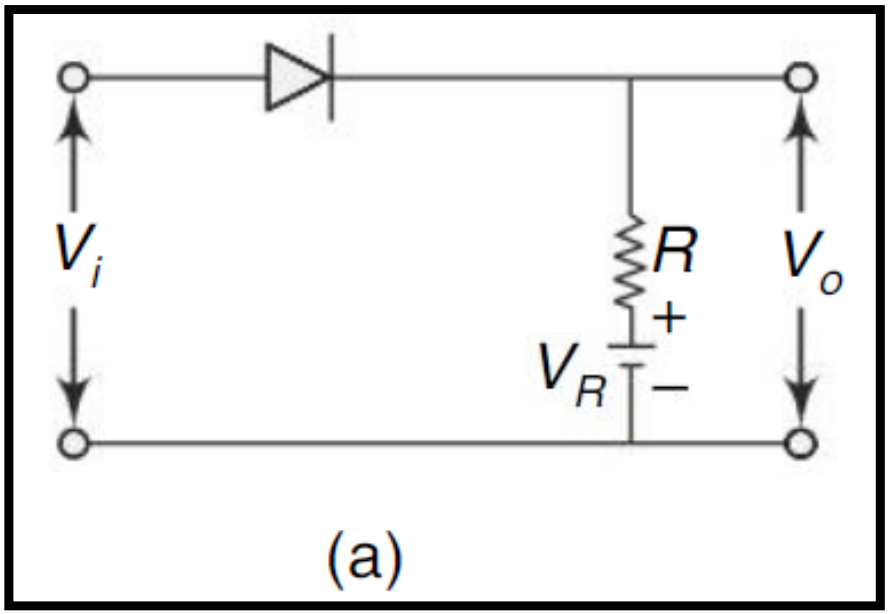

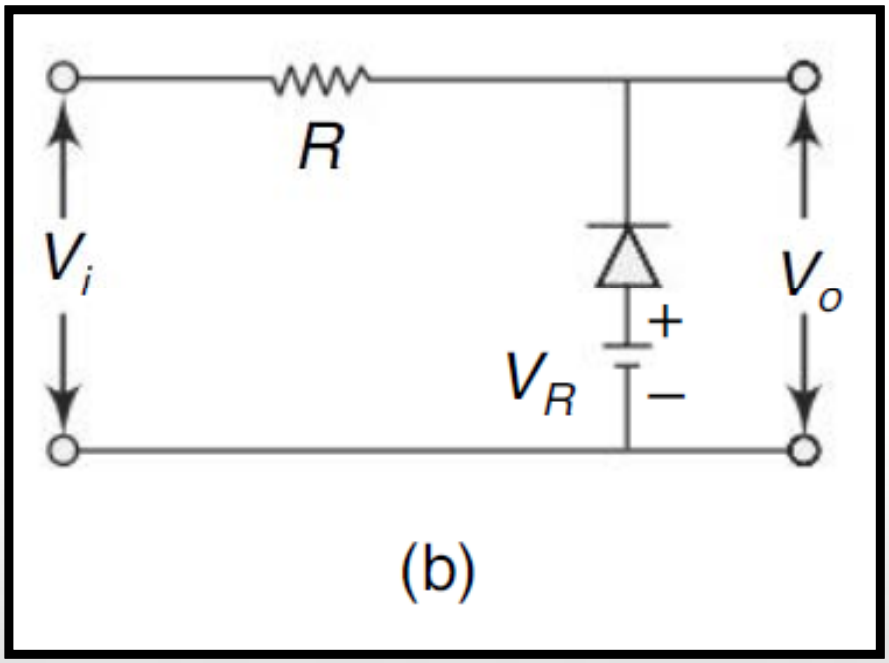

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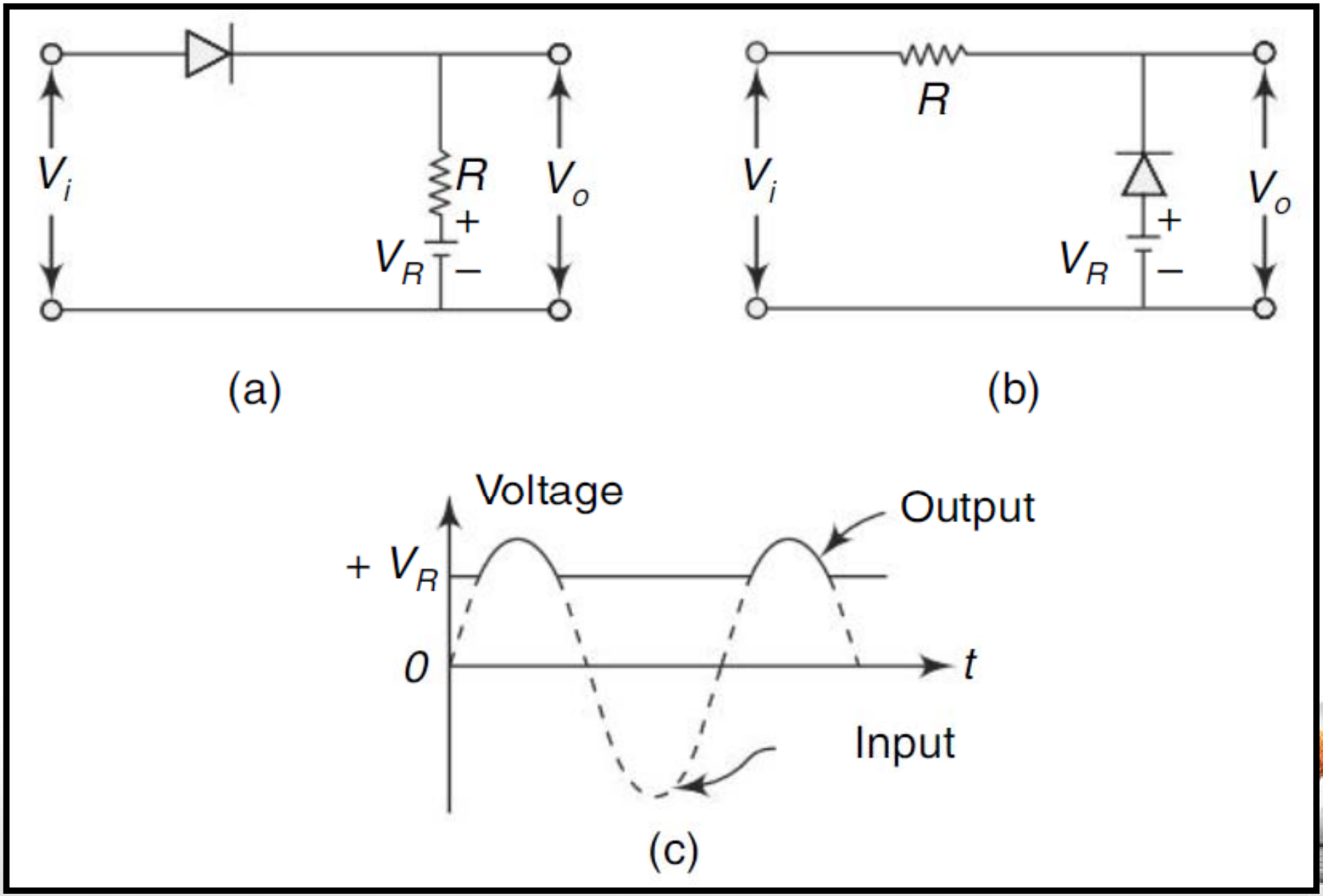
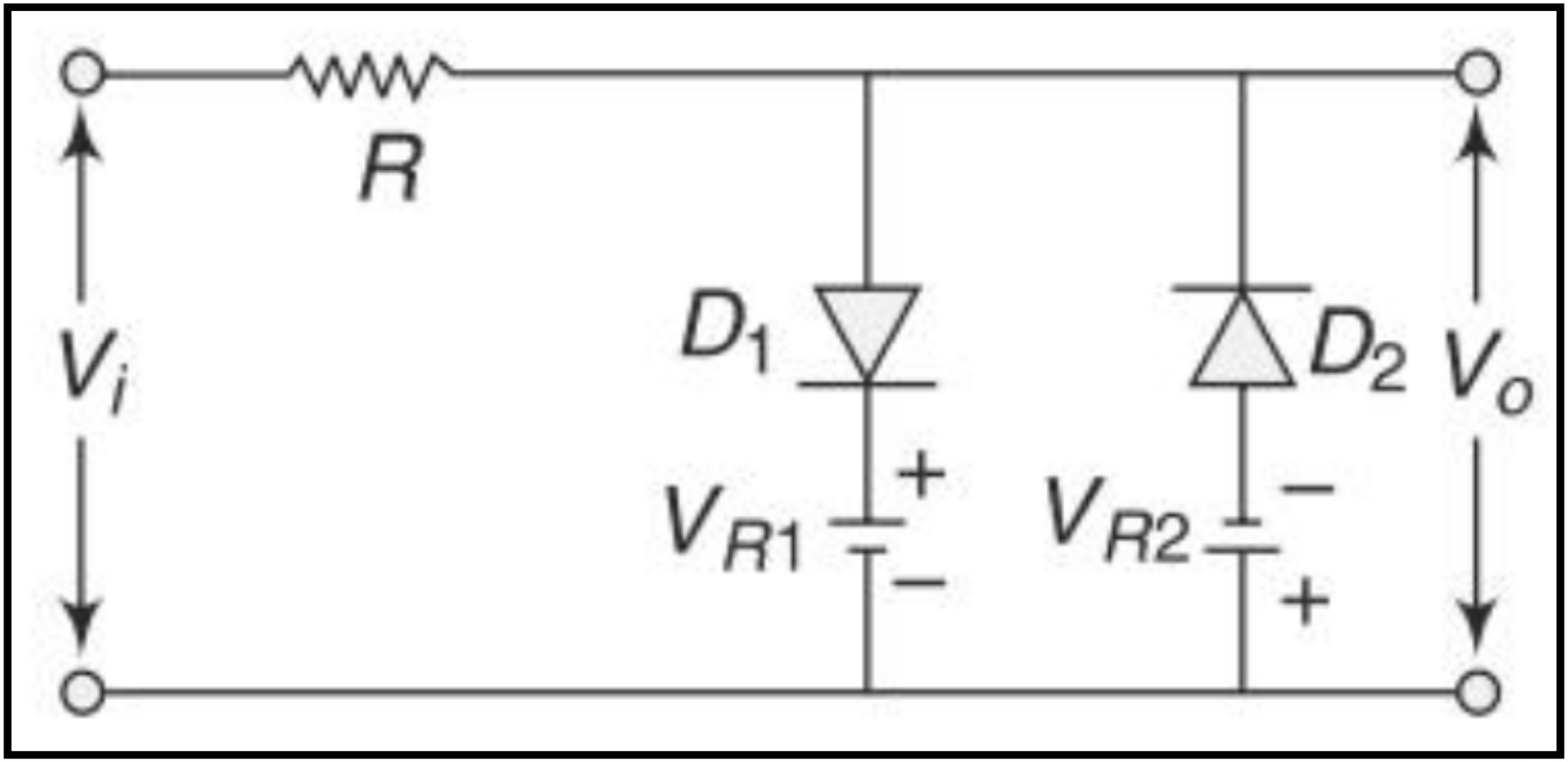


Two Level Clipper Circuit



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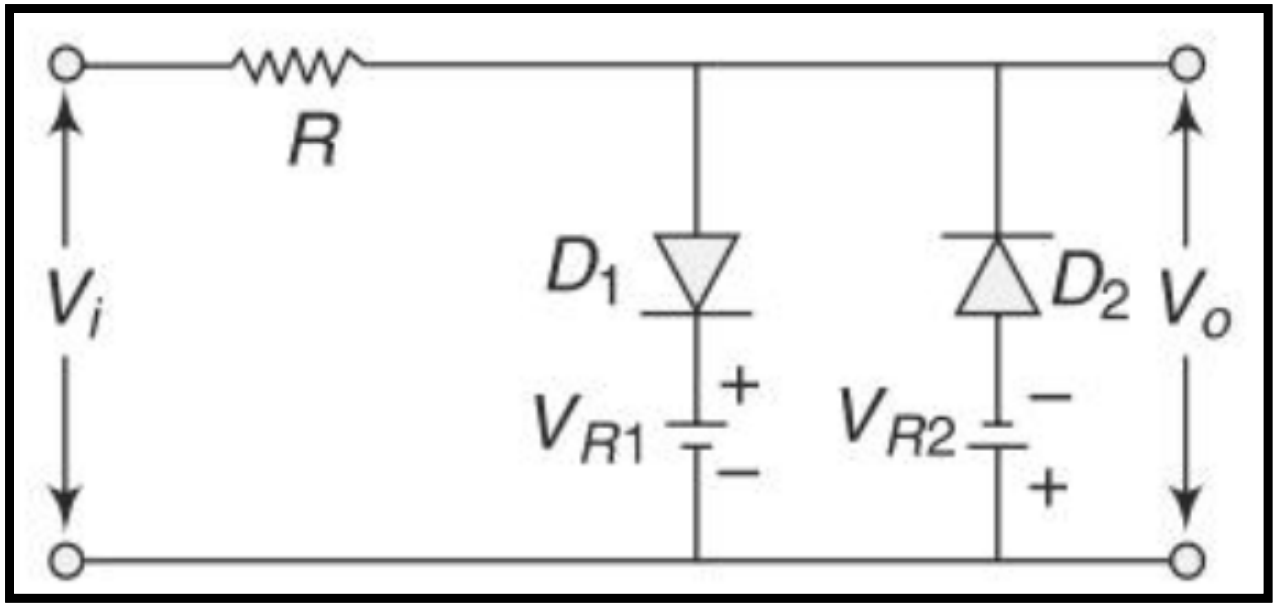

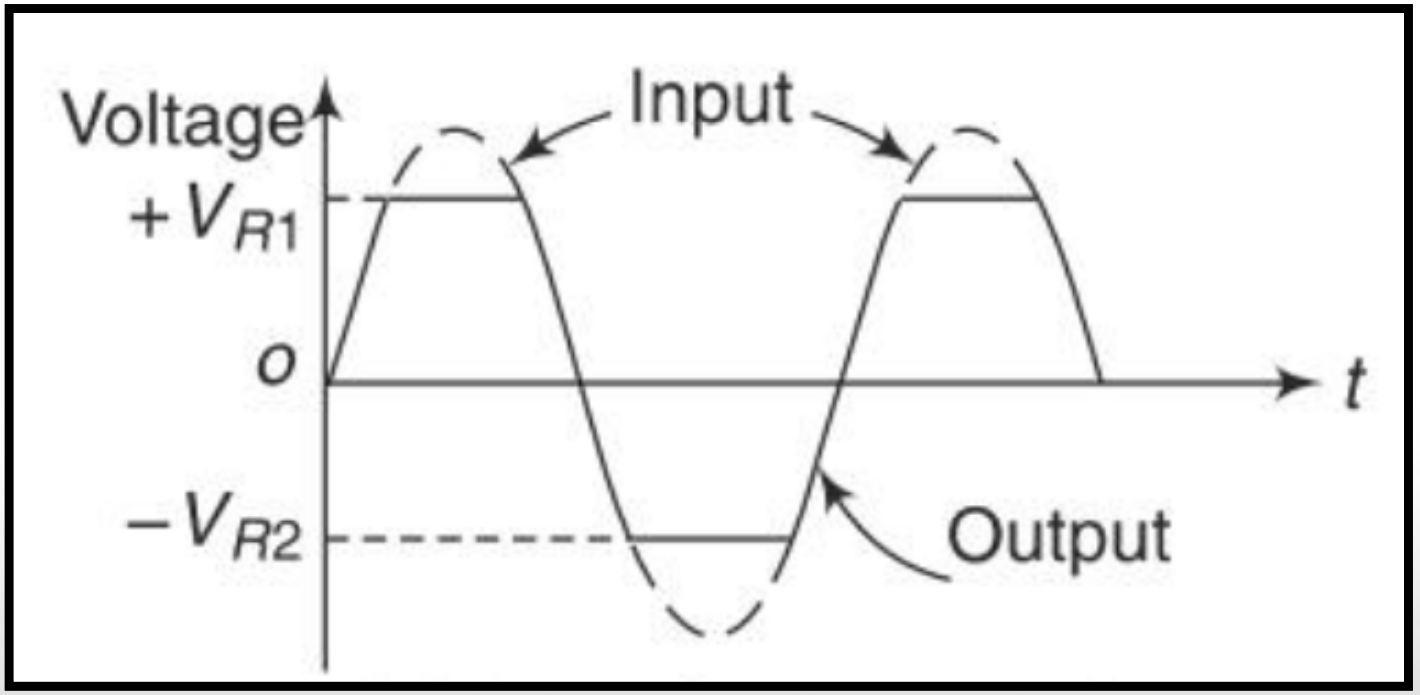

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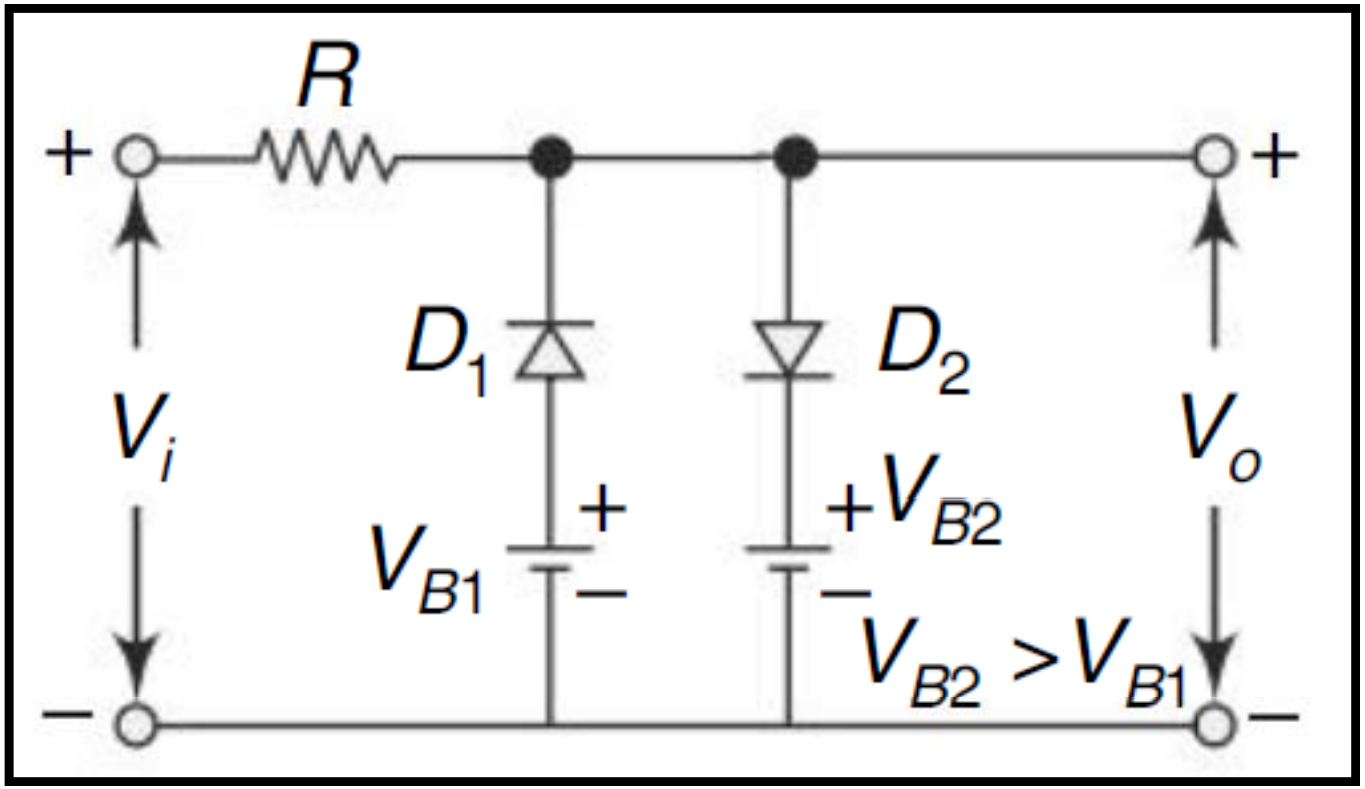

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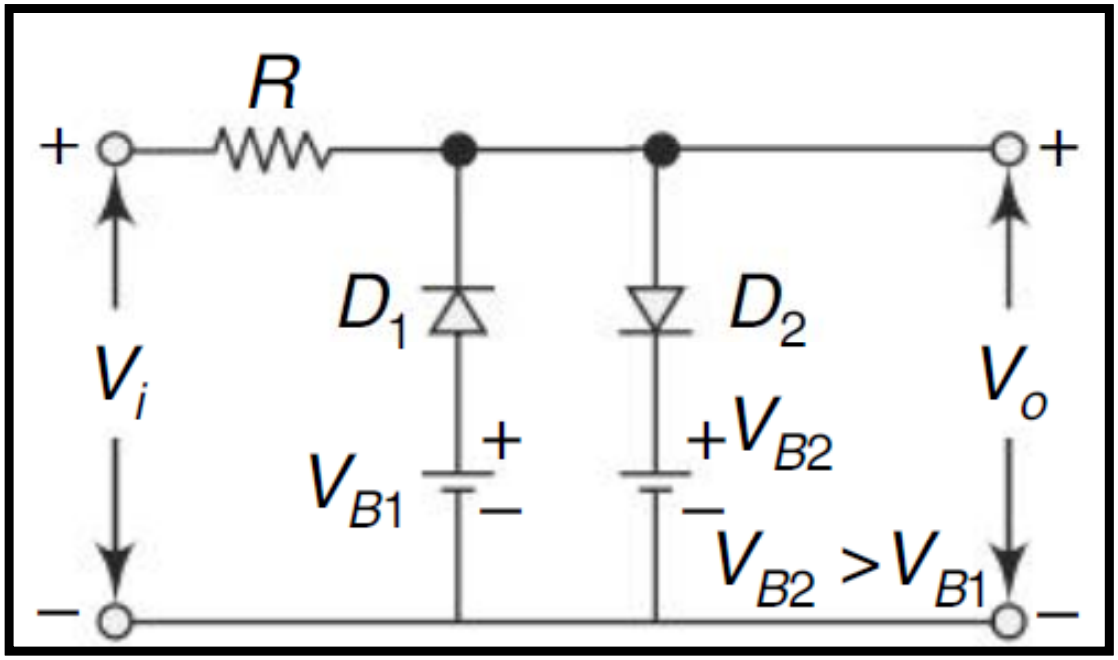
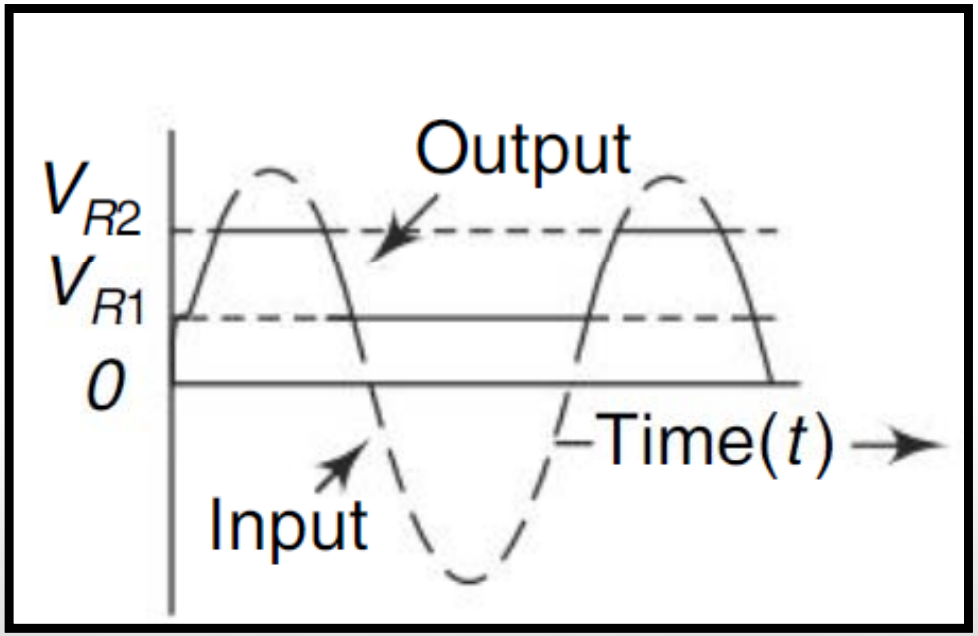
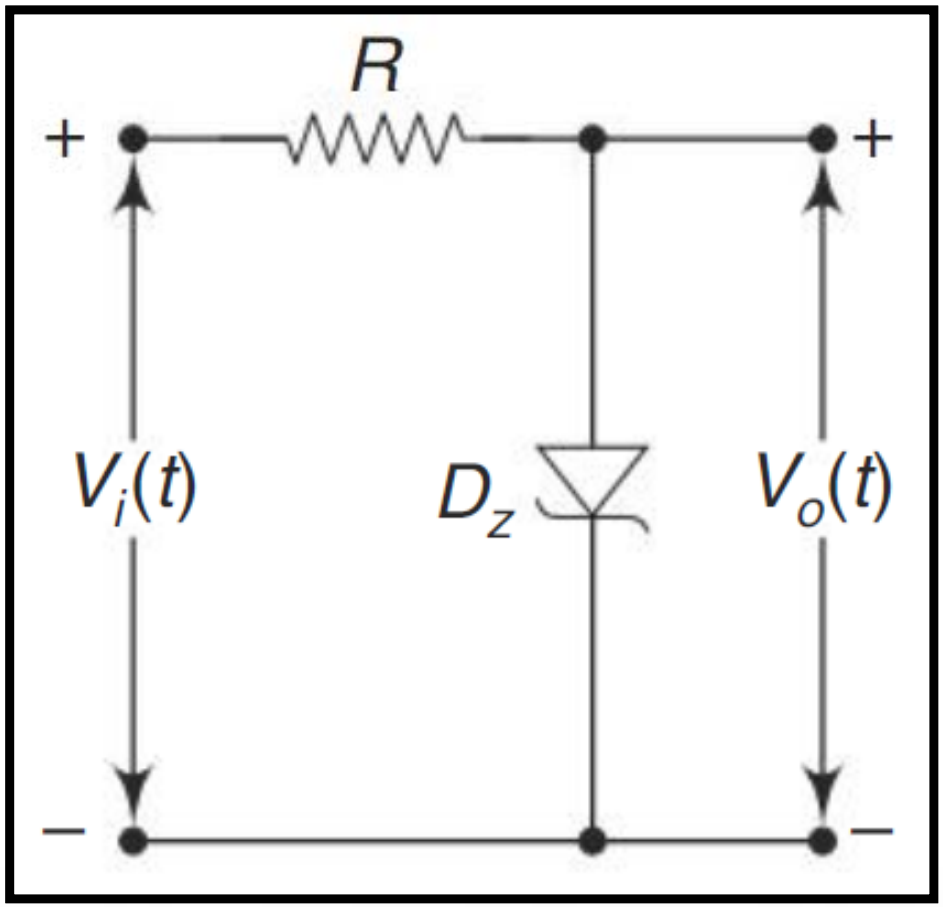
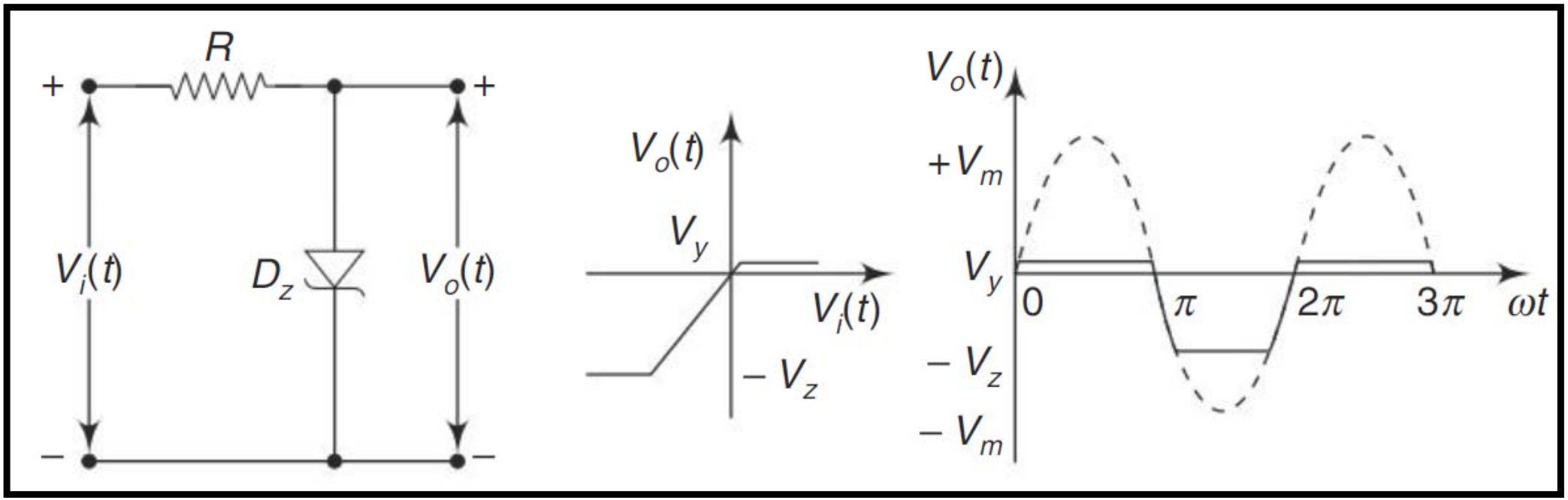




Zener Diode Clipper Circuits

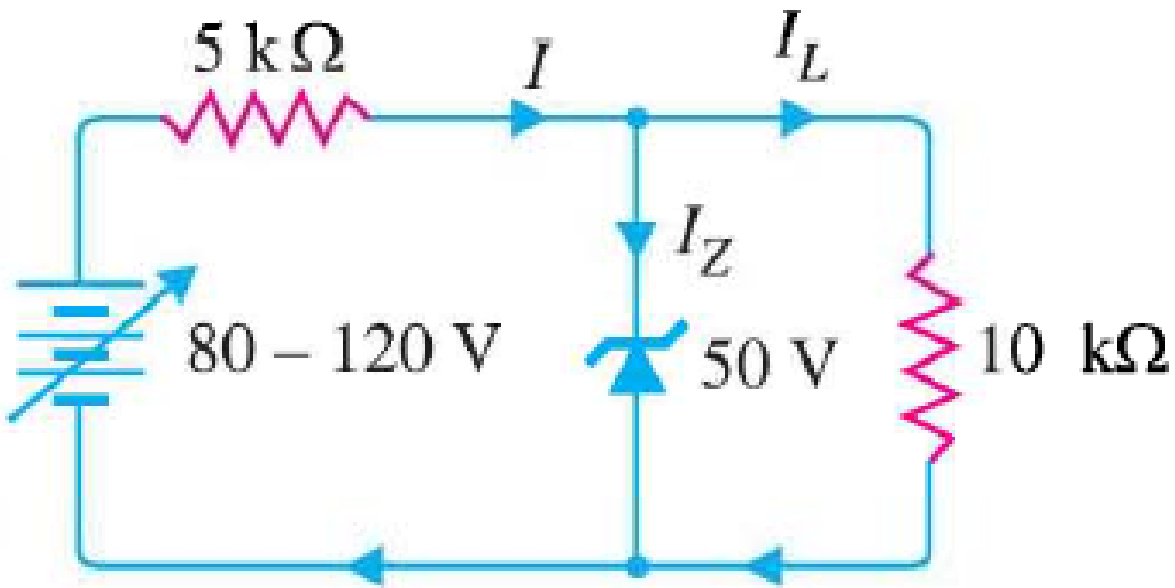


Solution

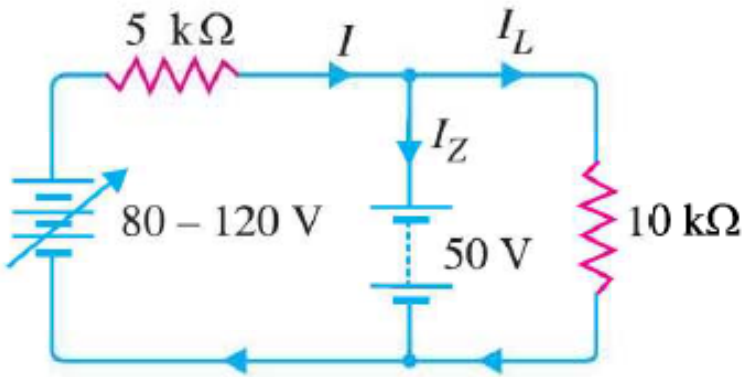


Question

- Determine the maximum and minimum values of Zener Current.



Solution



Voltage across 5 kΩ = 120 – 50 = 70 V

Current through 5 kΩ, $I = \frac{70\text{ V}}{5\text{ k}\Omega} = 14\text{ mA}$

Load current, $I_L = \frac{50\text{ V}}{10\text{ k}\Omega} = 5\text{ mA}$

Applying Kirchhoff's first law, $I = I_L + I_Z$

$\therefore$ Zener current, $I_Z = I - I_L = 14 - 5 = \mathbf{9\text{ mA}}$

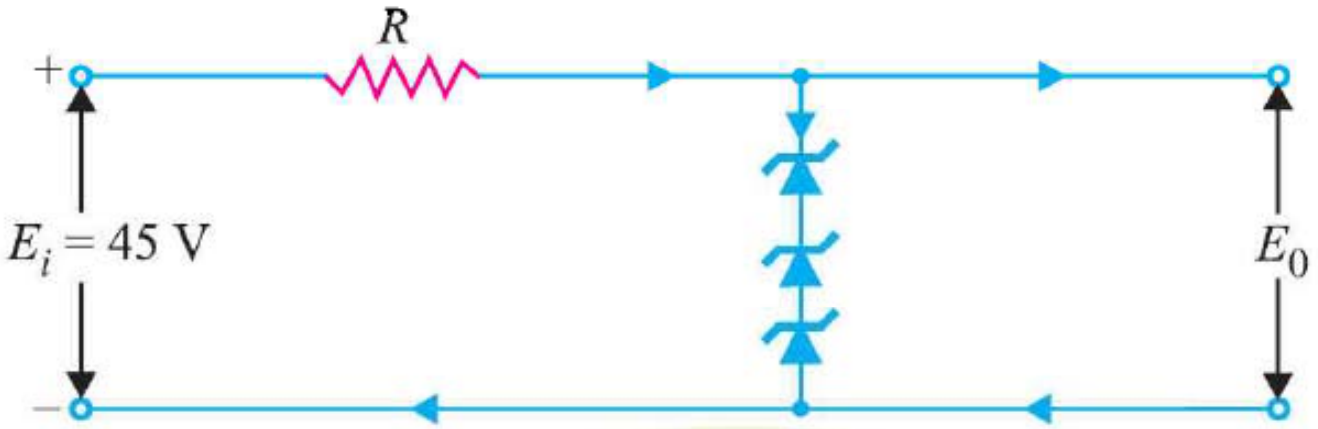
Voltage across 5 kΩ = 80 – 50 = 30 V

Current through 5 kΩ, $I = \frac{30\text{ V}}{5\text{ k}\Omega} = 6\text{ mA}$

Load current, $I_L = 5\text{ mA}$

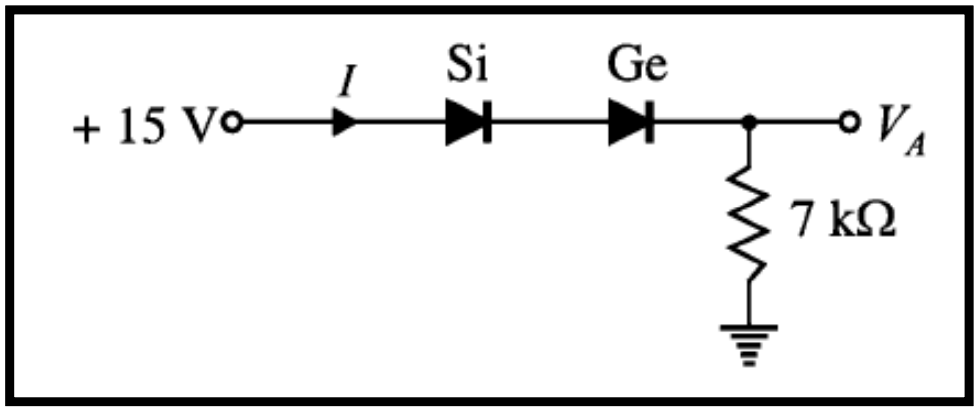
Zener current, $I_Z = I - I_L = 6 - 5 = \mathbf{1\text{ mA}}$

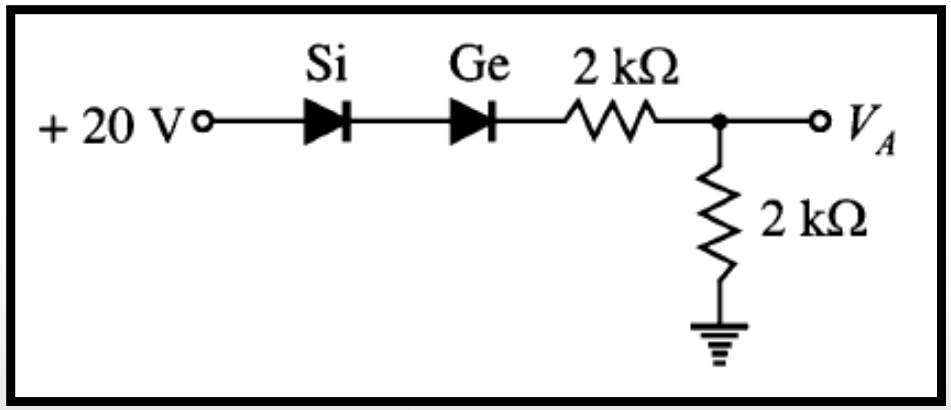
- What value of series resistance is required when three 10 W, 10 V, 1000 mA Zener diodes are connected in series across a 45 volts DC power source?



Question

- Determine Va:





Question

- In a CB connection, current amplification factor is 0.9. If the emitter current is 1 mA, determine the value of base current.
- In a CB connection has same emitter current as above. If the emitter is open, the collector current is measured to be 50 μA. Find the total current. Given $\alpha=0.92$.

- Determine the values β for 1) α=0.9 2) α=0.98 3) α=0.99
- The collector leakage current in a transistor is 300 μA in CE arrangement. If now the same transistor is connected in CB arrangement, what will be the leakage current? Given β=120.

To Be Continued...