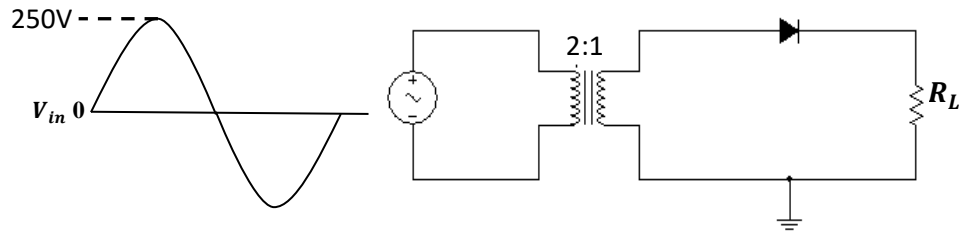**Example**: Determine the peak value of the output voltage of figure below:

$$V_2 = \left(\frac{N_2}{N_1}\right) V_1$$

$$= \left(\frac{1}{2}\right) (250V)$$
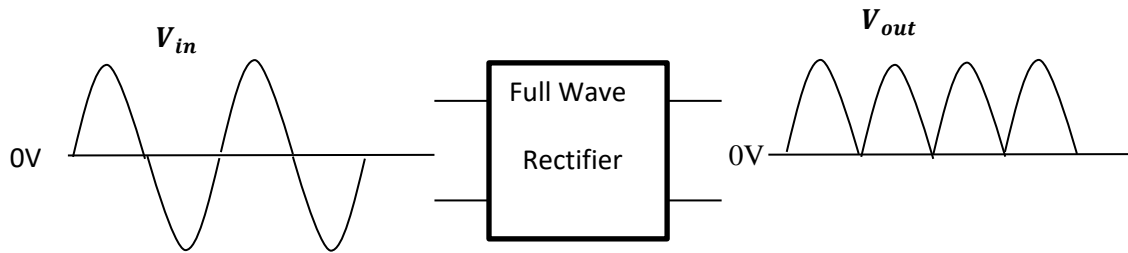
$$= 125V$$

Peak Value of Output Voltage

$$V_{p(out)} = V_{p(in)} - 0.7V$$

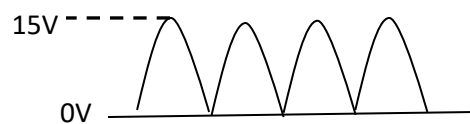$$= 125V - 0.7V$$

$$= 124.3V$$

2-3 Full-Wave Rectifier

- The average value for a full-wave rectified voltage is twice that of the half-wave.

$$V_{AVG} = \frac{2V_p}{\pi}$$

Example: Find the average value of the full-wave rectified voltage in Figure below:
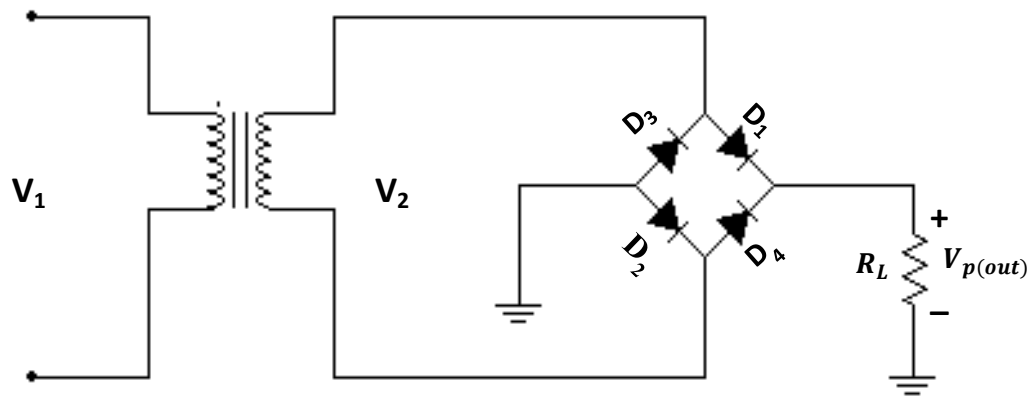
$$V_{AVG} = \frac{2V_p}{\pi} = \frac{2(15V)}{\pi} = 9.55V$$
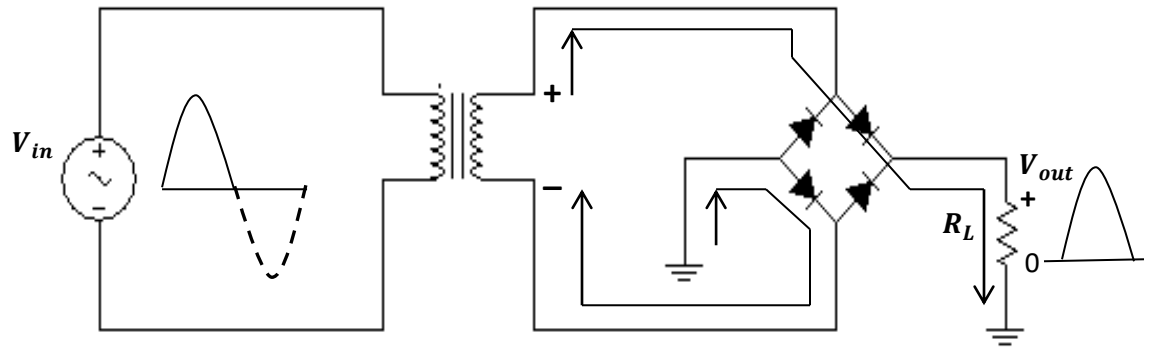
2-3.1 Center-Tapped Full-Wave Rectifier

Full-Wave Bridge rectifier is discussed below instead of Center-Tapped rectifier.
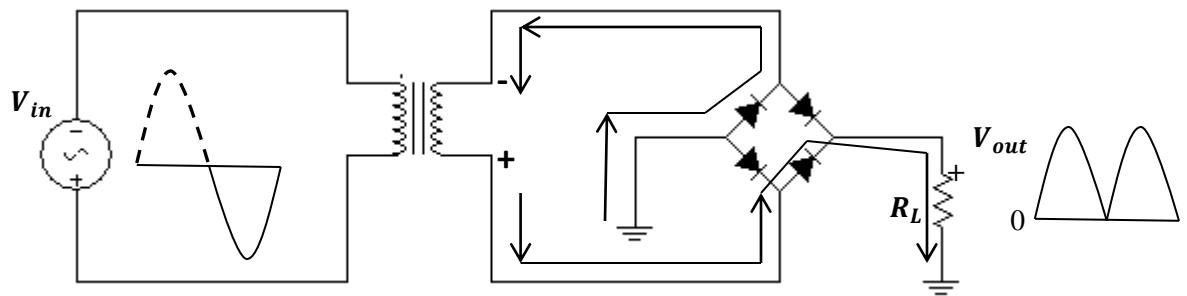
2-3.2 Full-Wave Bridge Rectifier

This type of full-wave rectifier uses four diodes as shown:

When the input cycle is positive, Diodes D_1 and D_2 are forward biased, while D_3 and D_4 are reverse biased.
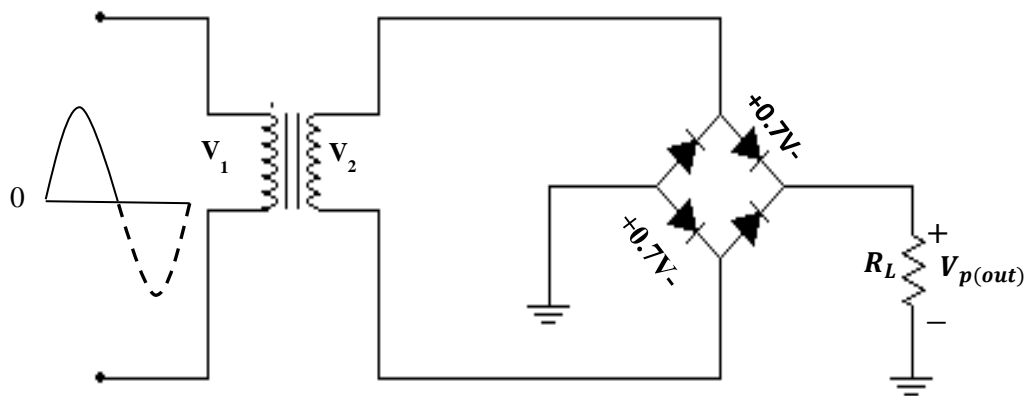

- When the input cycle is negative, Diodes D_3 and D_4 are forward biased, while D_1 and D_2 are reverse biased.

Bridge Output Voltage

A bridge rectifier with transformer-coupled input is shown, during the positive half-cycle of the secondary voltage.

$$V_{p(out)} = V_2 - 2V_B$$

Peak Inverse Voltage

Let us assume D_1 and D_2 are forward biased, D_3 and D_4 are reverse biased,

PIV = $V_{p(out)}$