

Q1)

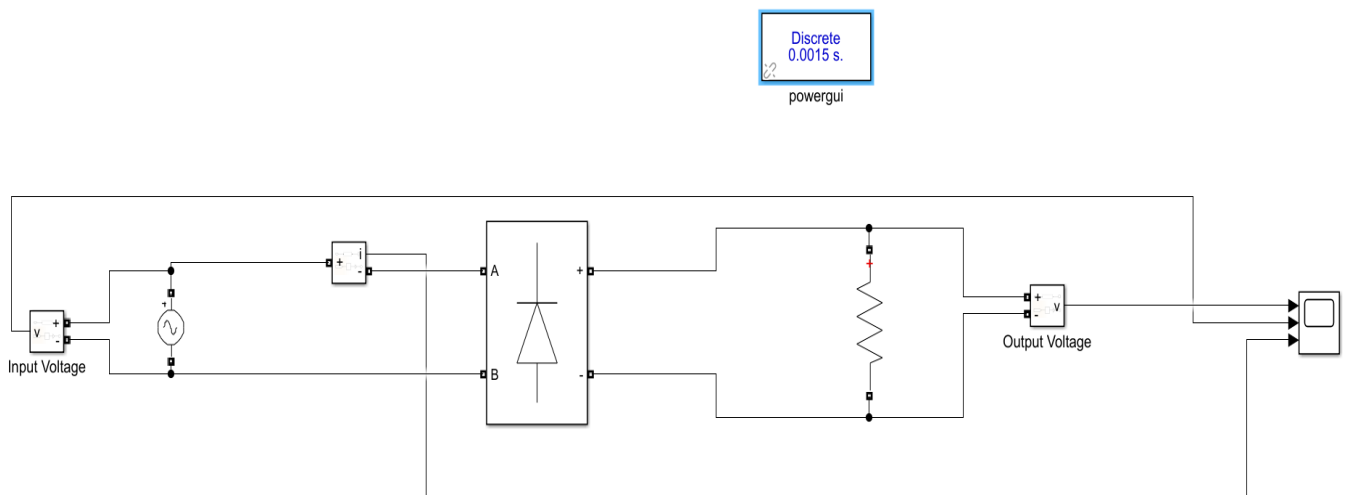


Figure 1: The circuit schematic of a single-phase diode rectifier feeding a resistive load of $R = 100\ \Omega$

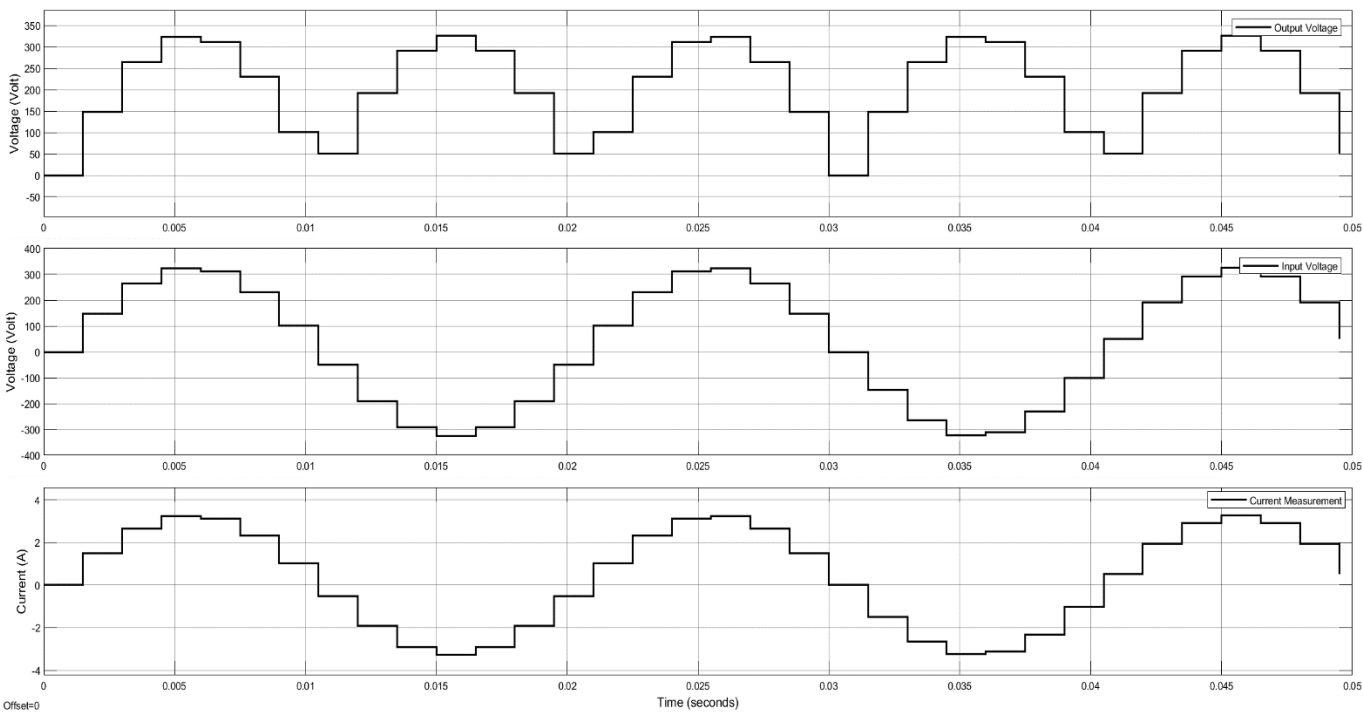


Figure 2: The simulation results for a single-phase diode rectifier when step size is 1.5 msec

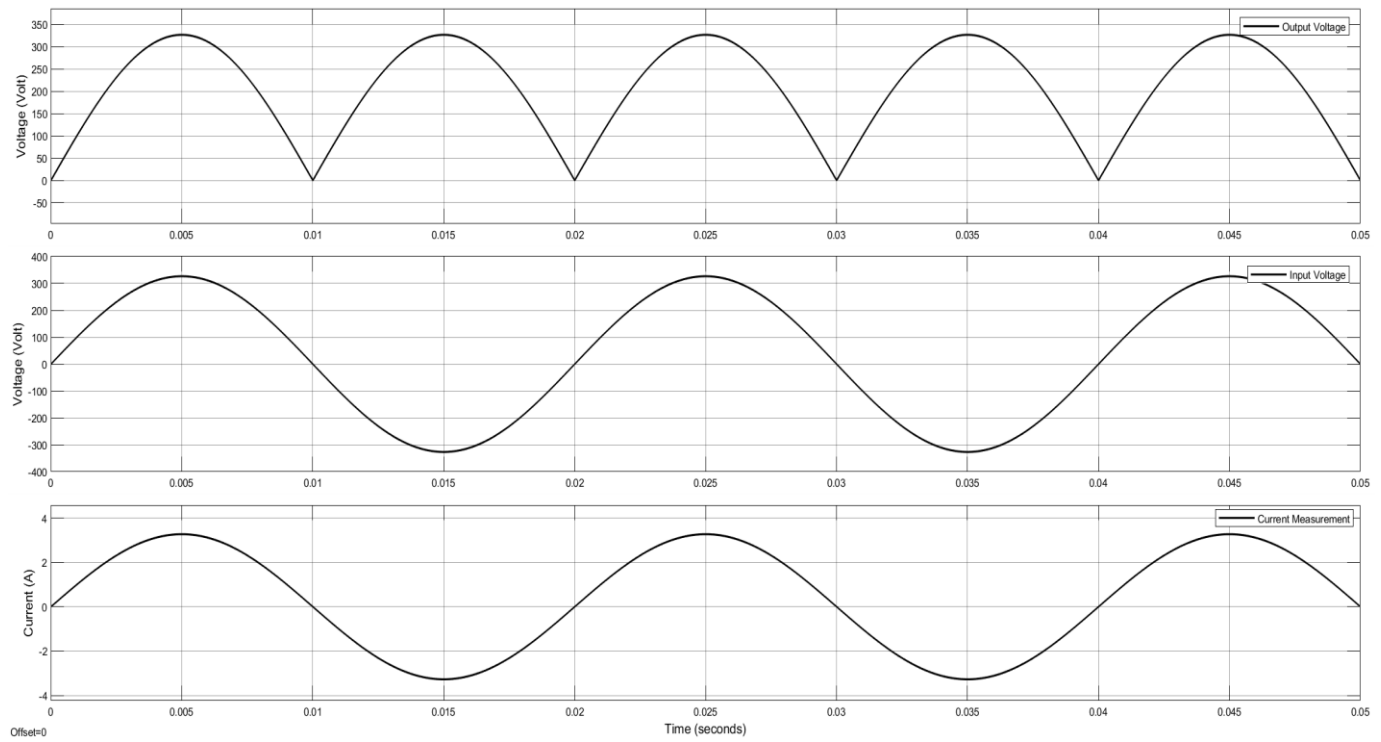


Figure 3: The simulation results for a single-phase diode rectifier when step size is 10 μsec

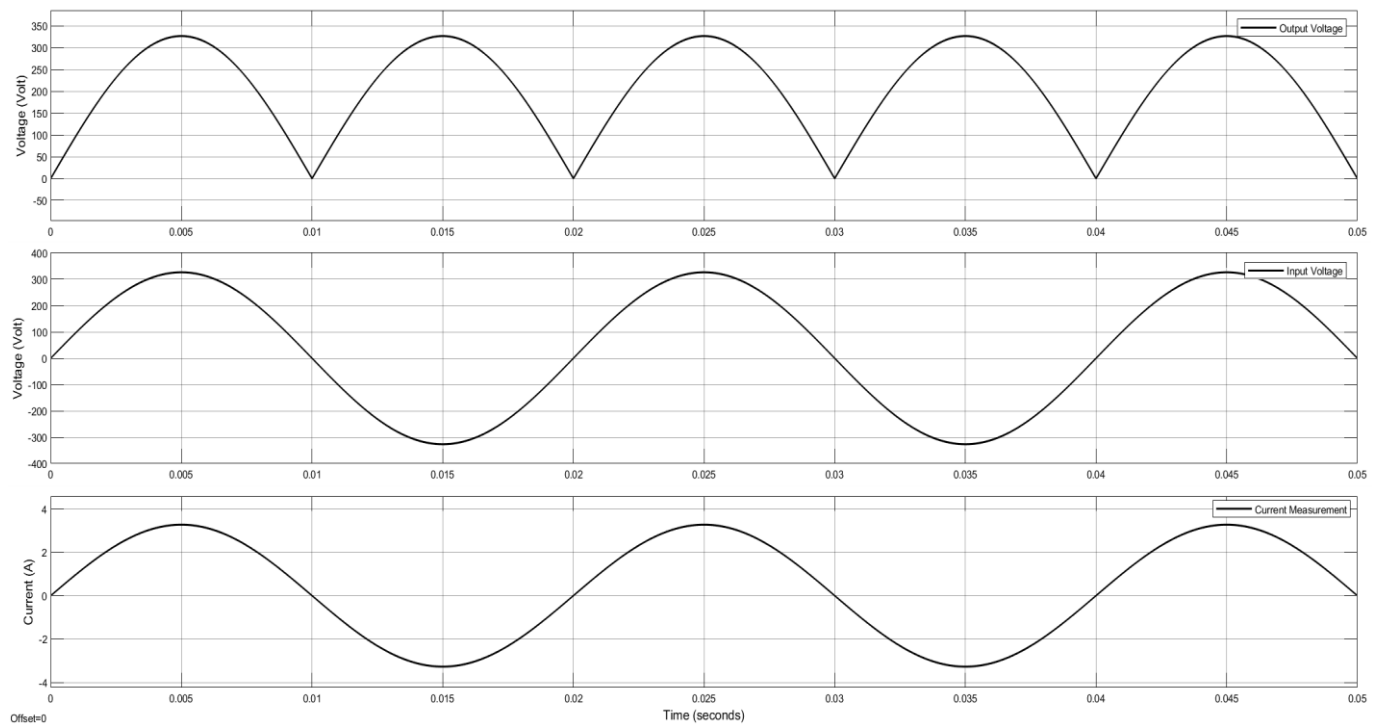


Figure 4: The simulation results for a single-phase diode rectifier when step size is 1 μsec

Step size is the time interval when computation happens for solver. Step size is the important property of solver because simulation results are affected by step size. A high step size will run quickly but take few data points and conversely a low step size will take many data points but take longer to run as a result. Whenever time step is not enough small, it can affect the consistency. In our question, when step size is selected to 1.5 msec, simulation takes shorter time, but waveforms are distorted as you can see Figure 2. On the other hand, for 10 μ sec and 1 μ sec step sizes simulation results are more accurate and nearly same which can be seen in Figures 3 and 4, respectively. Difference is that simulation for 10 μ sec takes a little bit longer time compared to 1 μ sec, but this is acceptable with respect to results.