Ex. No. 6 **Date:25.10.2020**

Design of Single phase Half wave and Full wave Rectifiers

Aim:

To design a circuit to perform single-phase half wave and full wave rectifier using OrCAD Pspice software.

Apparatus/Tool required:

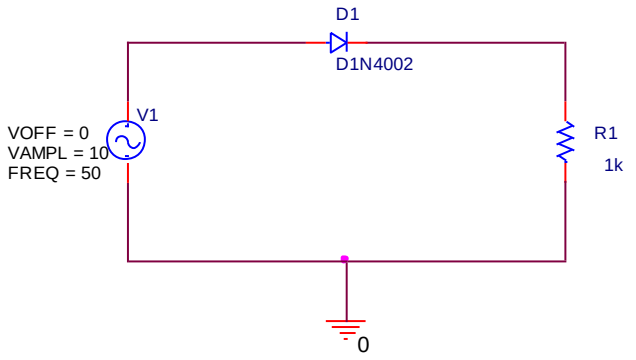
ORCAD / PSpice simulator -> **Diode Library - D1N4002/4007,**
Source Library – Vsin & Ground (GND) – 0(zero)
Analog Library – R

Simulation Settings: **Analysis Type - Time Domain**

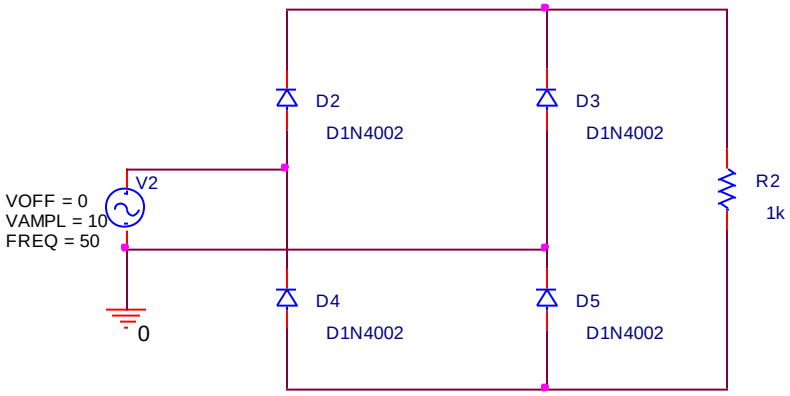
Run to time: 40ms (for 2 cycles)

Circuit Diagram:

Single phase Half – wave Rectifier



Single phase Full – Wave Rectifier



Theory:

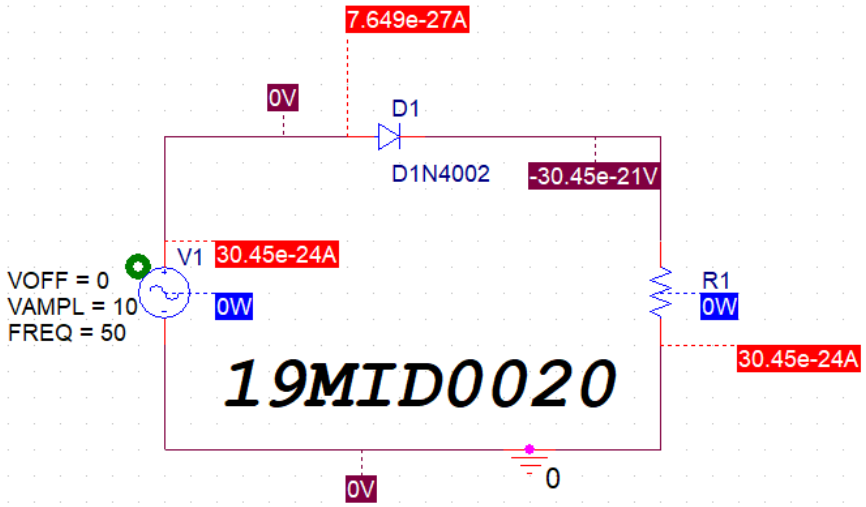
Half – wave Rectifier:

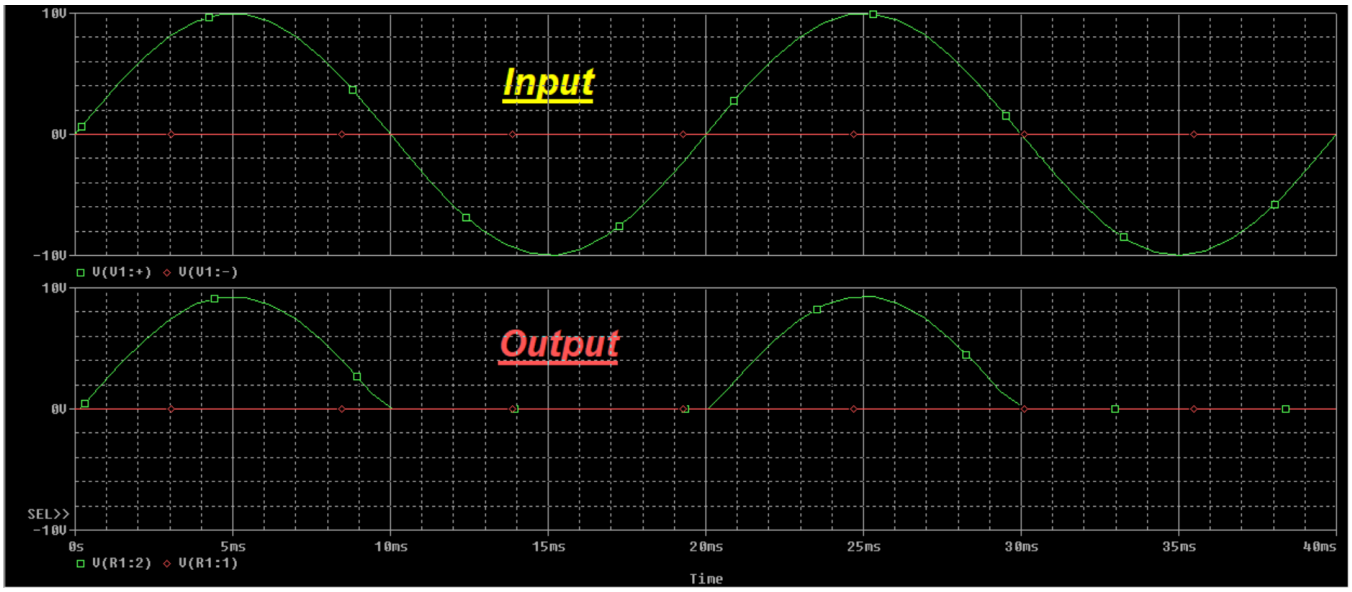
A half wave rectifier is defined as a type of rectifier that only allows one half-cycle of an AC voltage waveform to pass, blocking the other half-cycle.

Full – wave Rectifier:

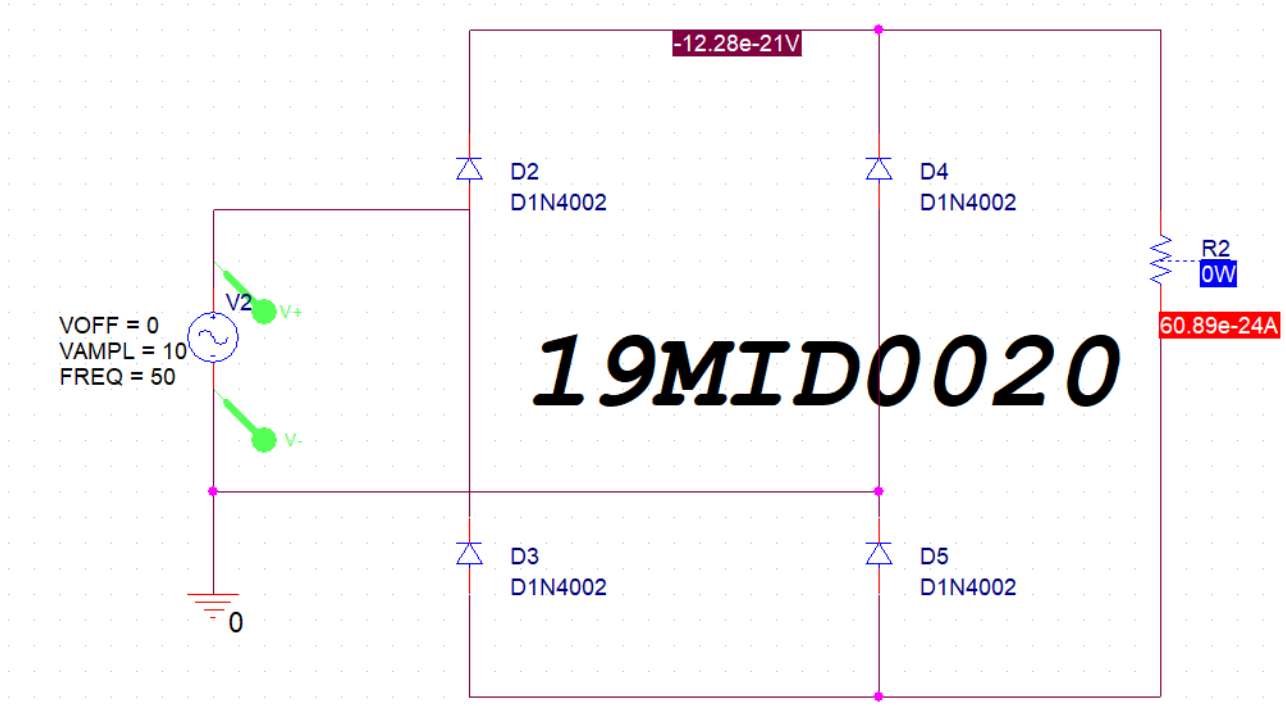
The circuits which rectify both the positive and negative half cycles of an input alternating waveform, the rectifiers are referred as full wave rectifiers.

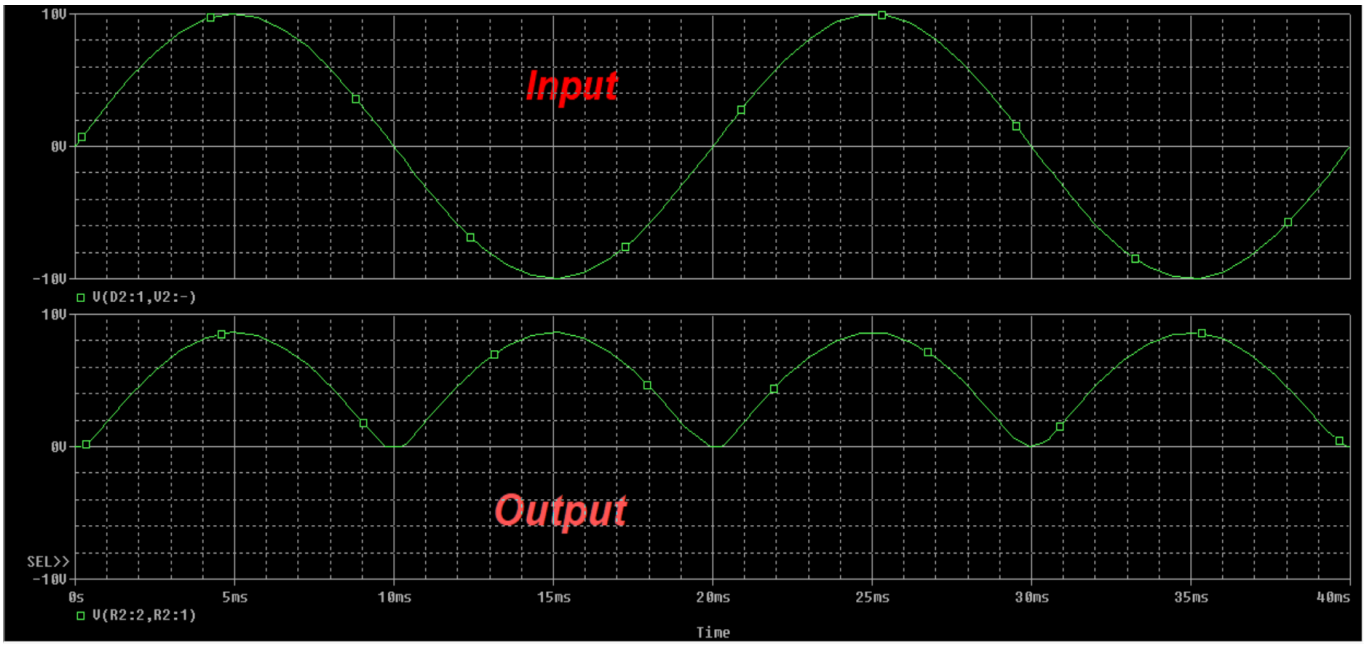
Circuit and Output of a Half-wave Rectifier:





Circuit and Output of Full-wave rectifier:





Procedure:

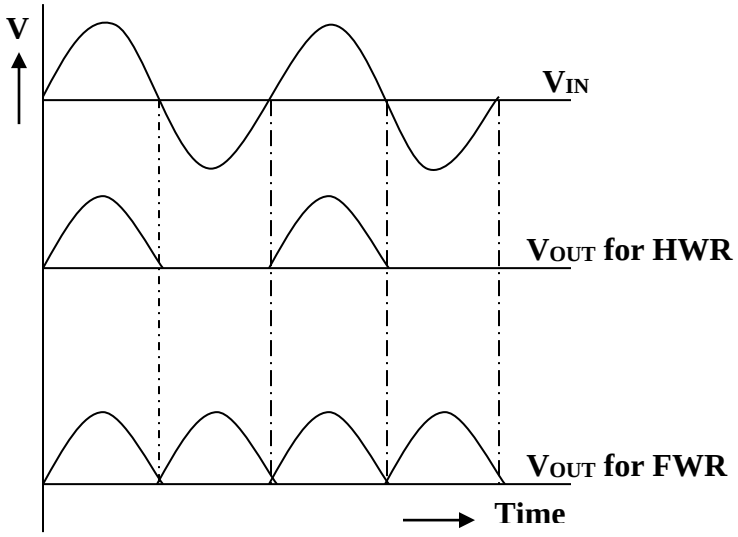
✓ Design the circuit using the software

✓ Create simulation profile of type "Time Domain" and set the value of Run time as 40ms

✓ Place the Voltage differential marker before and after the source to get the input AC wave simulated graph

✓ Similarly place it before and after the Load Resistor and run it to get the output DC wave graph.

Model Graph:



Result:

The simulation of Single-phase Half wave and Full wave rectifier is performed using OrCAD Pspice software.

Inference:

✓ Rectifier coverts a AC source to DC form.

✓ Half wave rectifier converts the positive half cycles of the AC to DC form

✓ Full wave rectifier converts both the positive and negative half cycles of the AC source to DC source.

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