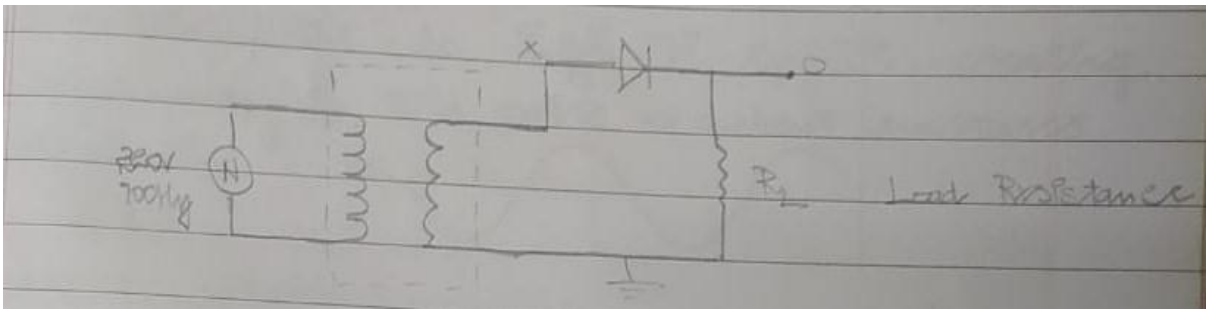
EXPERIMENT-3

HALF-WAVE RECTIFIER

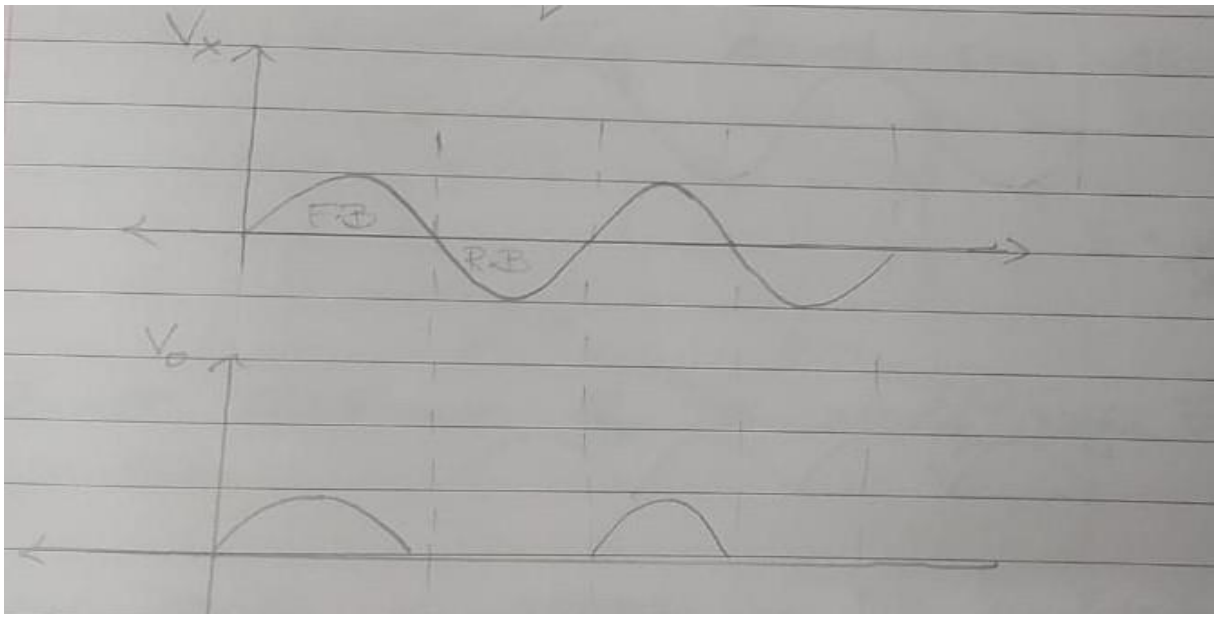
AIM:

To represent a half-wave and bridge wave rectifier and explain the working.

CIRCUIT:



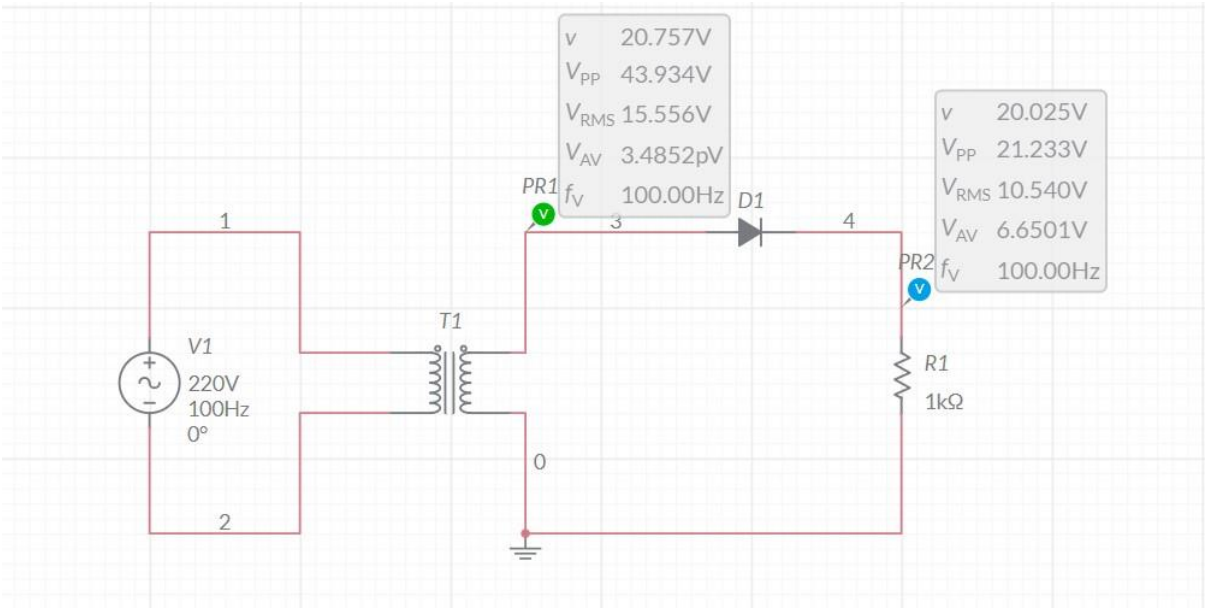
GRAPH:

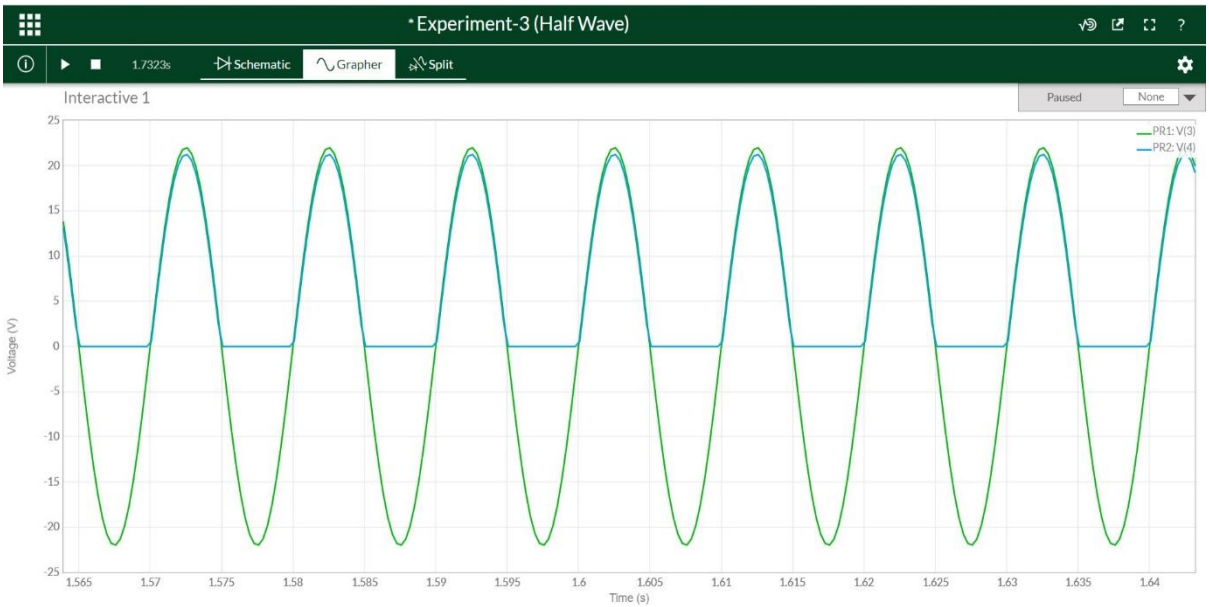


PROCEDURE:

- The diode is under the forward bias condition during the positive half cycle. And, the current is conducted to the load resistance.
- So, the voltage is established across the diode.
- And, the diode is under the reverse bias condition during the negative half cycle. And, so there is no movement in the circuit and current flow equals zero.
- So, only the voltage which was established in the diode is there; which is the net result of the positive half cycle of the circuit.
- And, the generated output voltage is responsible for pulsing the Dc voltage from the rectifier circuit.

MULTISIM:

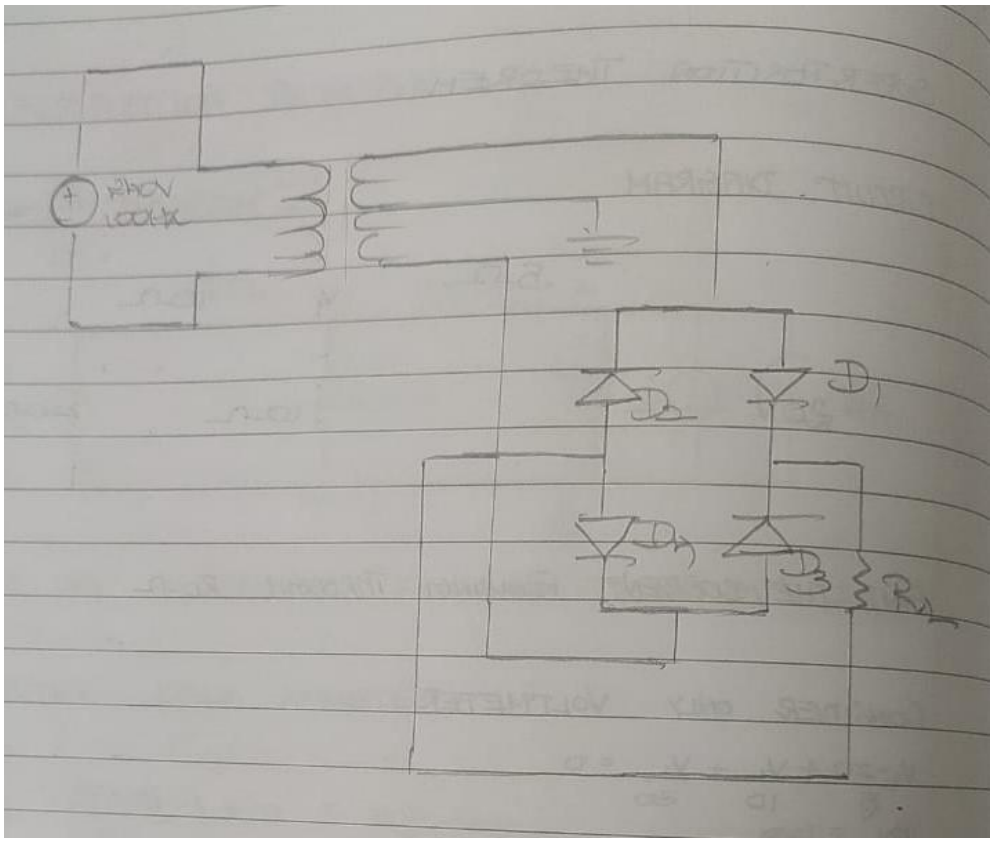




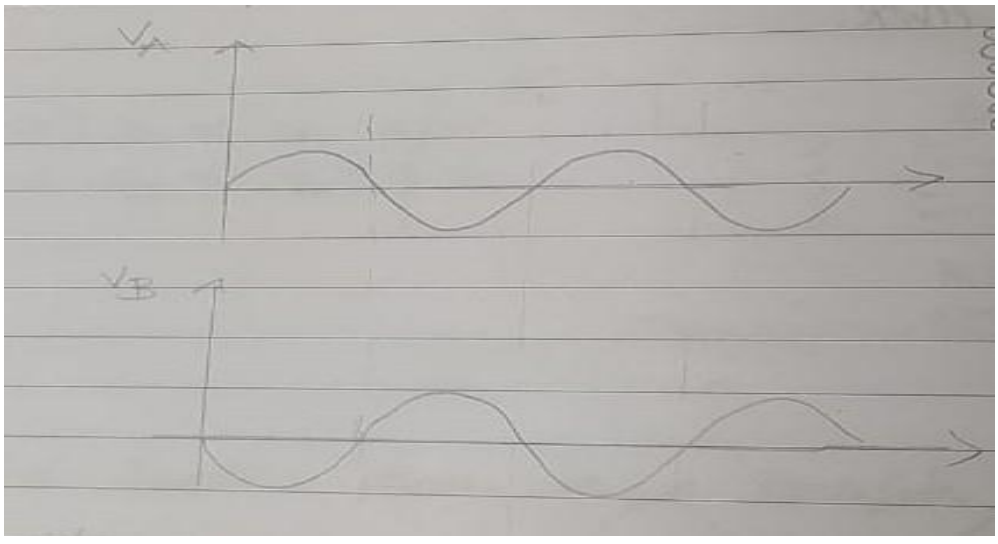
V_{DC} = 11.199 V
I_{DC}= 10.483 mA
V_{RMS}= 15.556 V
I_{RMS} = 10.540 mA
Ripple Factor = 1.21

FULL-WAVE RECTIFIER

CIRCUIT:



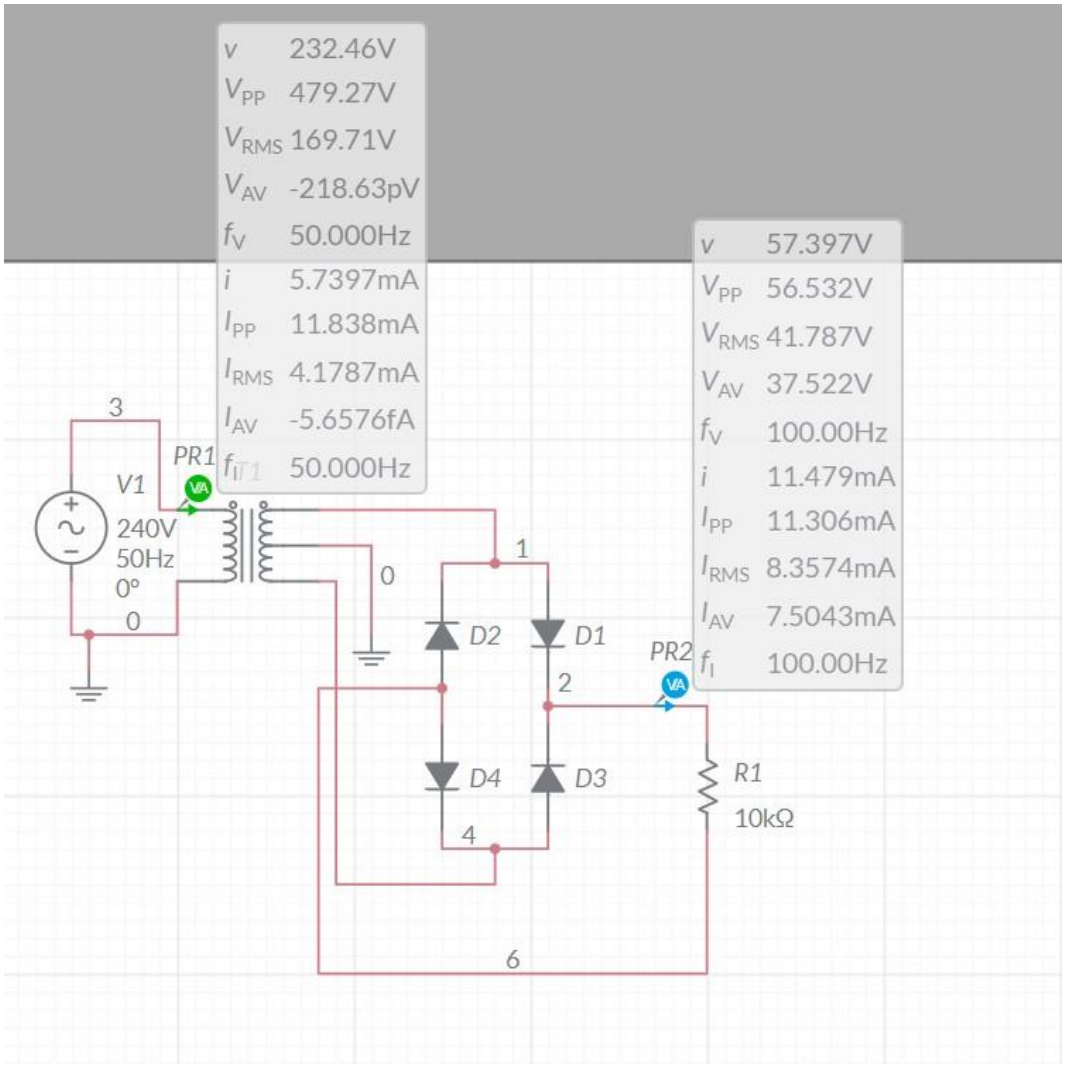
GRAPH:



PROCEDURE:

- In the first positive half cycle of the AC signal, the diodes D1 and D3 become forward biased and start conducting. At the same time, the diodes D2 and D4 will be reverse biased and will not conduct.
- Current will flow through the load resistor via the two forward biased diodes.
- Now, during the negative half cycle of the AC signal, the diodes D2 and D4 will be forward biased and diodes D1 and D3 will become reverse biased.
- The positive voltage will appear on the anode of D4, and negative voltage will be applied to the cathode of D2. The current that will be flowing through the load resistor will have the same direction as it has with the positive half cycle.
- Therefore, no matter the polarity of the input signal, the output polarity will always be the same. We can also say that the negative half cycle of the AC signal has been inverted and is appearing as a positive voltage at the output.

MULTISIM:



V_{DC} = 232.46 V
I_{DC}= 5.739 mA
V_{RMS}= 1169.74 V
I_{RMS} = 4.178 mA
Ripple Factor = 0.48

NAME: G R NITIN

ROLL NO: CB.EN.U4CYS21017