BE LAB TASK # 10

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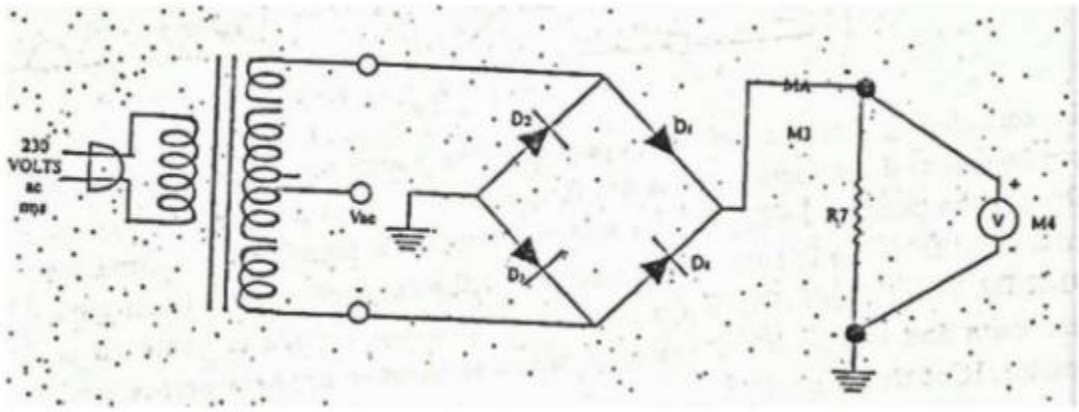
Topic: Full Wave Rectifier

Objectives:-

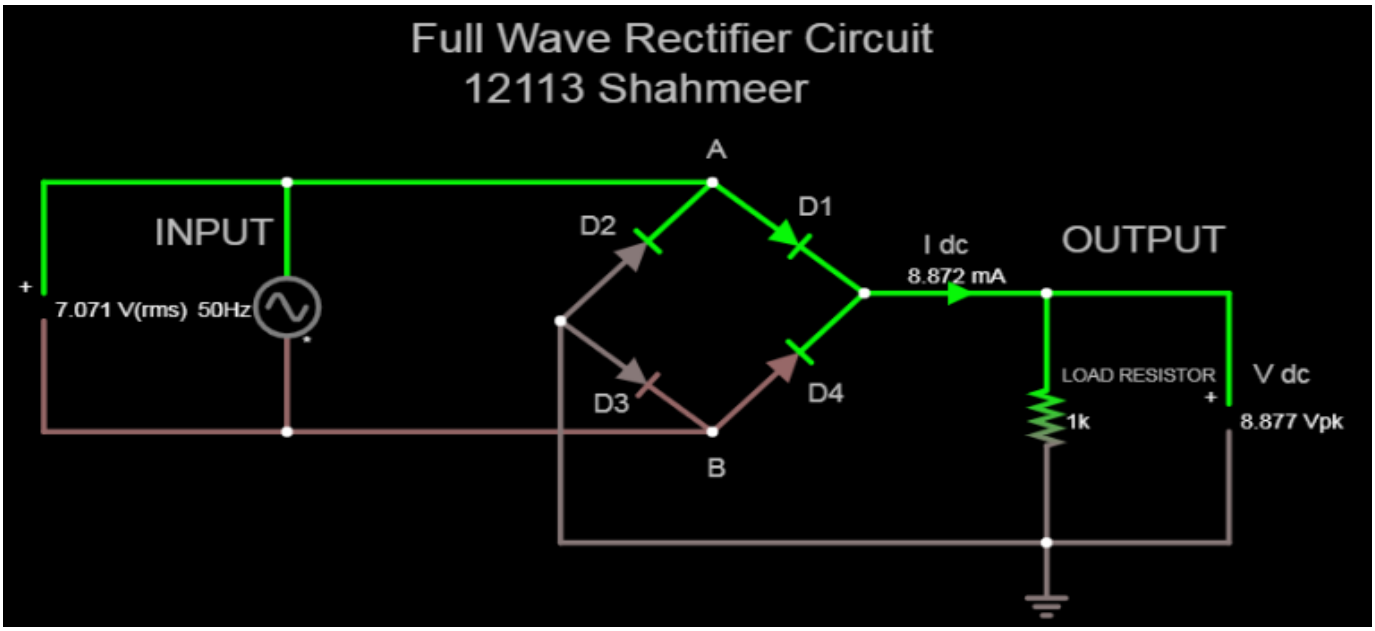
- **To study the use of four Diodes in a bridge as a Full Wave Rectification.**

Lab Task:

- **Connect the circuit as shown in fig-2:**



- **SCREENSHOT of Circuit as asked:**



5. Use the function of Voltmeter at 10 volts ac.

6. Use UT55 to measure the Ac Voltage, Vac across the Output terminals of the Voltage transformer. Voltmeter will read the Rms value of the Ac voltage.
   Vac = **7.071** volts

7. Measure the dc current, indicated on Ampere meter DC. This will be equal to the average value of full wave rectified current, lav, through the load resistor, R1.
   Idc = **8.872** m Amp.

8. Measure the dc voltage Vdc, across the load resistor, R1, indicated by the dc voltmeter, o the trainer.
   Vdc = **8.877** volts.

9. Calculate the peak value, Vp of the Ac input voltages measured in Step 6.
   Since Formula:
   Vp = Vac/ 0.707

   7.071 / 0.707

   Vp = **10.00** volts.

10. Calculate the peak current Ip, through the load resistor R1, from the current measured in Step 7.
    Since Formula:
    Ip = Vdc/ R

    8.877 / 1000

    Ip = **8.877** m Amp.

11. Calculate the average value of the full wave rectified output voltage across the load resistor R1, also check that this value is corresponds wit the value of Vdc obtained in step 8, this is given by Vav = Idc * R1.
    Since Formula:
    Vav = Idc * R

$(8.872 \times 10^{-3}) \times 1000$

Vav (out) = **8.877** volts.

12. Calculate the dv value (half cycle average) of the input voltage from the maximum value Vp by using.
    Vdc = 0.636 * Vp
    Vdc = 0.636 * 10
    Vdc (in) = **6.36** volts.

13. Refer to step 8 for the average value of the Output dc voltage developed across R1, Subtract this value from the dc value of the input voltage Vdc obtained in step 12.
    (Step 12 – Step 8)

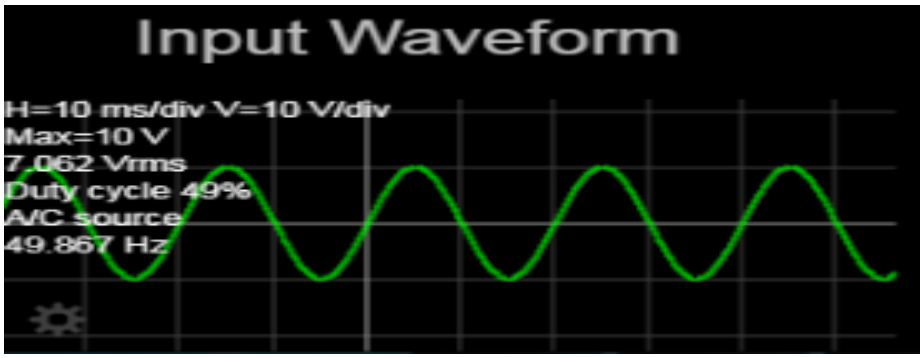
    6.36 – 8.77

    V(diff) = **-2.41** volts.

14. Refer to the V-I characteristics obtained in diode experiment. Determine the voltage drop across the diode which corresponds to the dc current through the diode, obtained in Step 7.
    (Step 9 – Step 8)
    10.00 – 8.87
    Vdiode = **1.123** volts

15. While the coupling switch is in DC Position. Draw the waveforms displayed on the oscilloscope in Scope Chart shown below.
    Indicate the peak, rms, and the average of the full-wave rectified output voltage waveform as well as the input voltage waveform.

- **SCREENSHOT of input waveform:**



Voltage Sensitivity = **10** volts/div

Time Per Division = **10** msec/div

* INPUT VOLTAGE WAVEFORM

Since: Vp =**10** volts

Peak to Peak Voltages

Vp-p = Vp x 2

Vp-p = **10 x 2 = 20** volts

Vrms = 0.707 x Vp

0.707 x 10

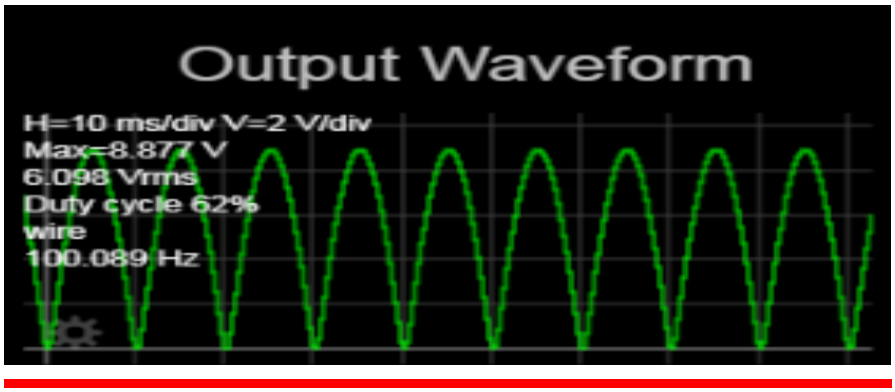
Vrms = **7.07** volts

Vav = Vp(output) * 0.636

10 x 0.636

Vav =**6.36** volts

- **SCREENSHOT of Output WaveForm:**



- **OUTPUT VOLTAGE WAVEFORM**

Vp = **8.877** volts

Vav = **5.645** volts

Vrms = **8.877** volts

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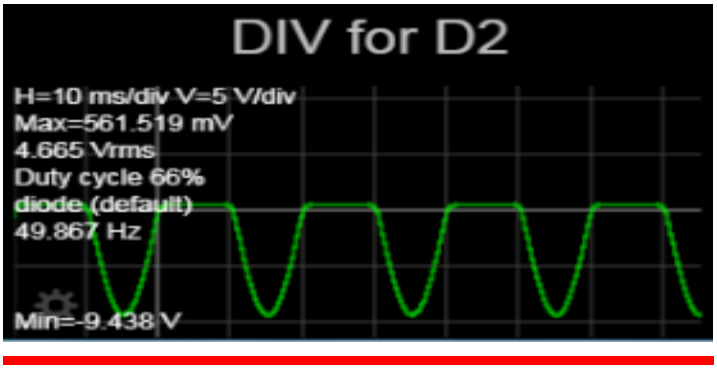
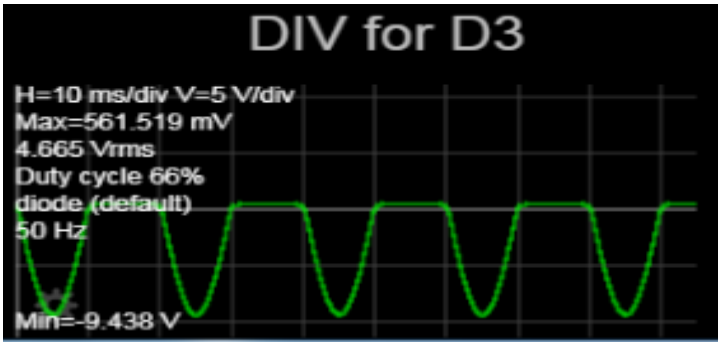
16. Connect the probes of the oscilloscope at the nodes between D1 & D2 and b/w D3 and D4. Connect the ground lead of one probes the nodes b/w D3 and D2. Draw the wave from and measure peak values. These are the PIV values across the diodes.

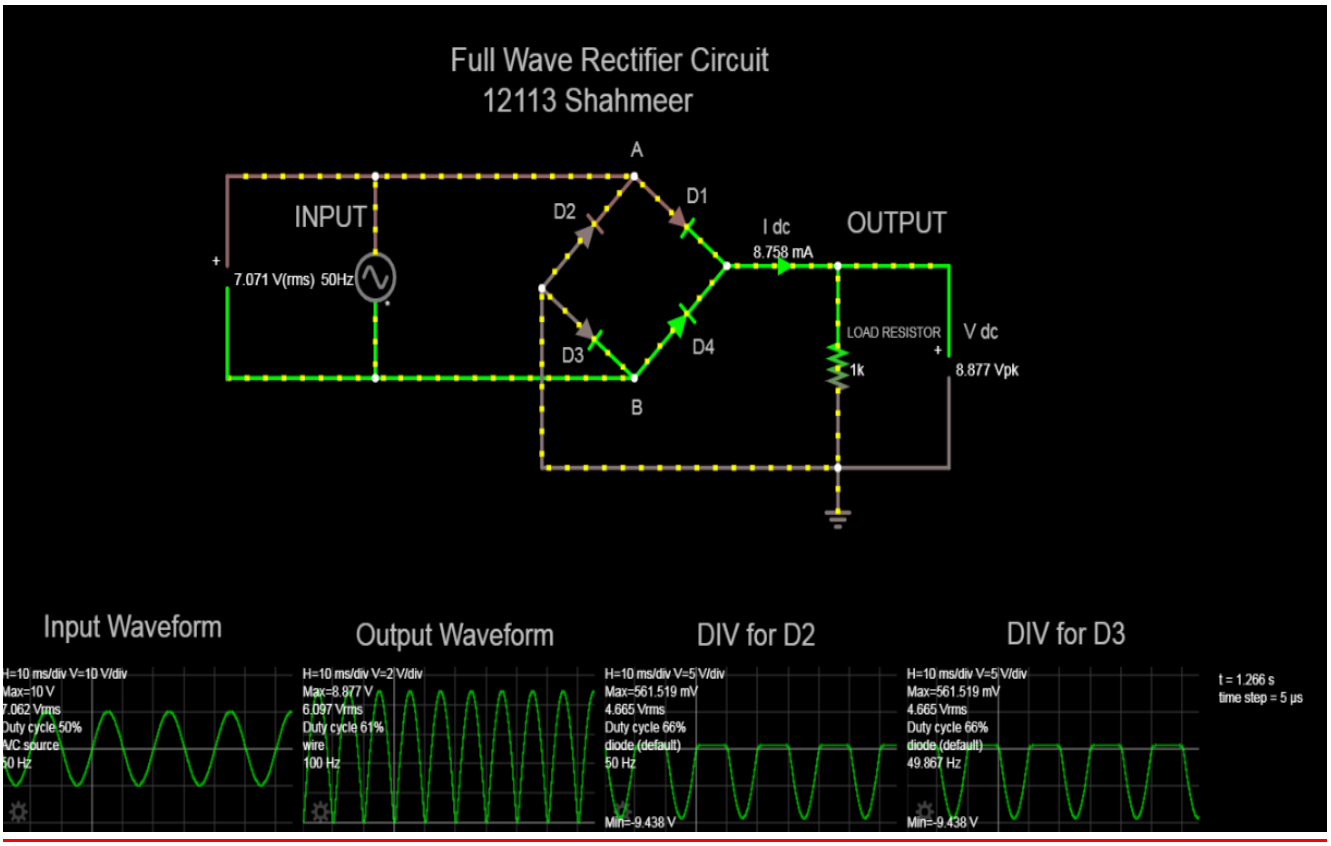


PIV (D2) = **561.519** m volts



PIV (D3) = **561.519** m volts

- **Screenshot of whole circuit:**



- ***Link of Simulator:***

https://tinyurl.com/yhqpsbub