

BE LAB TASK # 09

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Topic: Half-Wave-Rectifier.

OBJECTIVES:-

- To demonstrate the use of Semi-Conductor DIODE as Half Wave Rectifier.

LAB TASK:

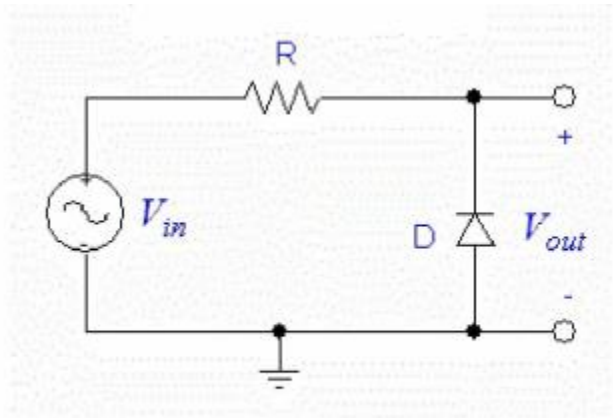
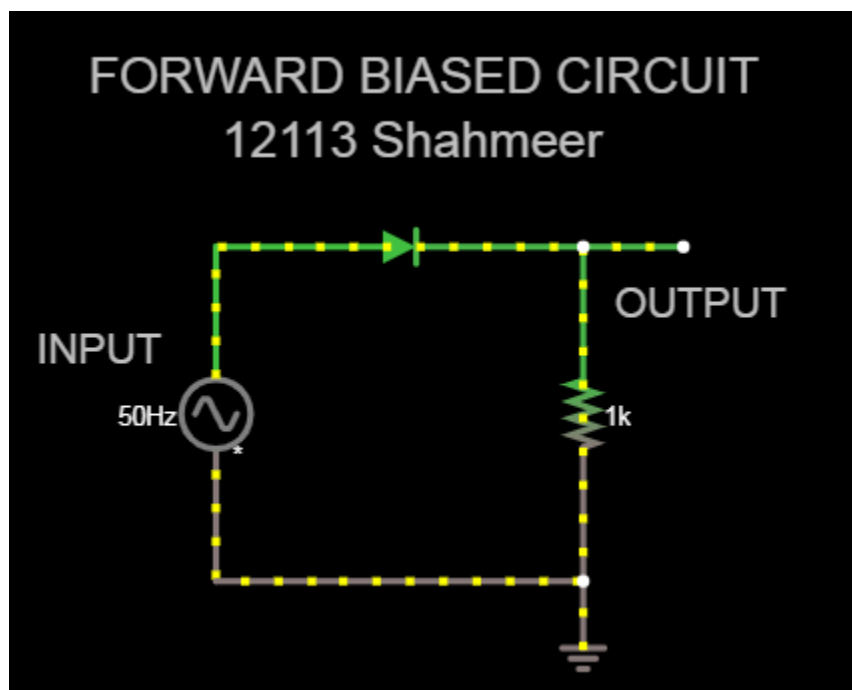
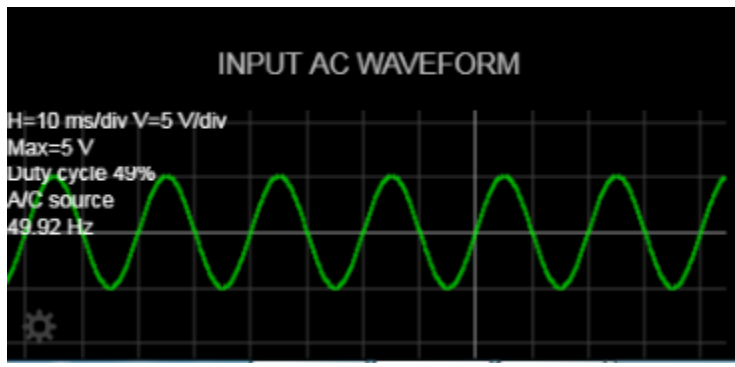


Fig-3

CONNECT THE CIRCUIT AS SHOWN IN FIG-3



- **GENERATE PEAK-TO-PEAK VOLTAGE FROM FUNCTION GENERATOR OF $V_{\text{input}} = 10\text{V}_{\text{p-p}}$**



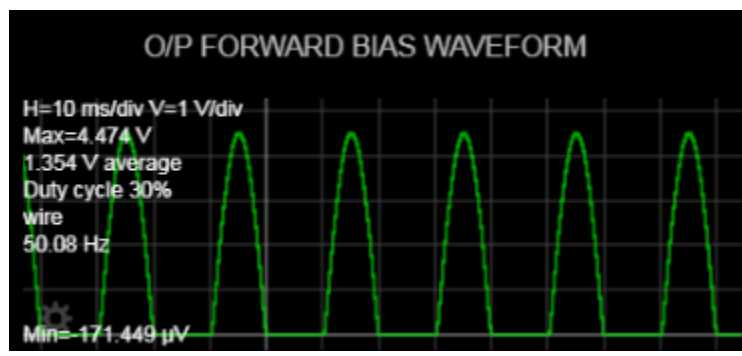
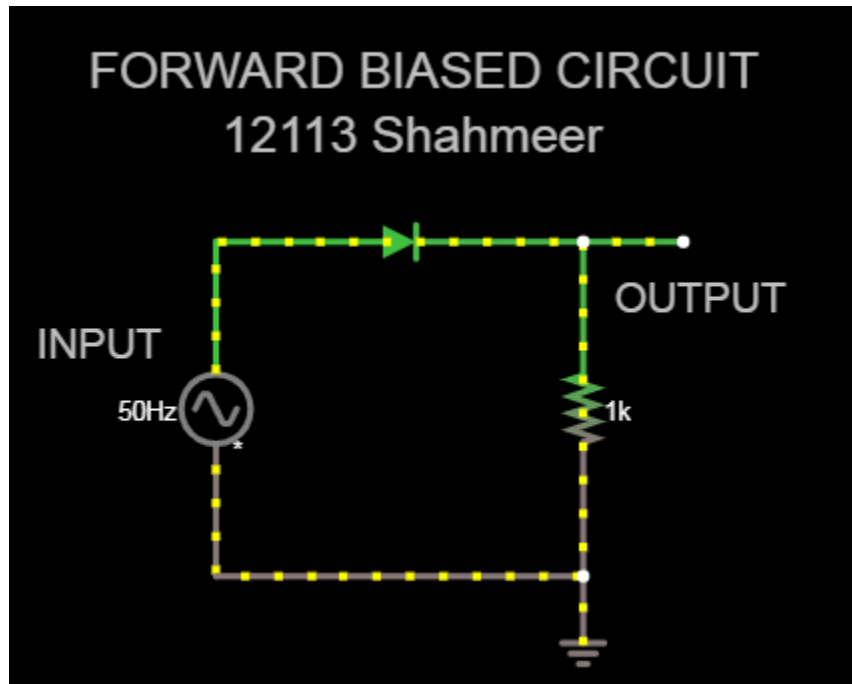
- **CALCULATE PEAK VALUE OF V_{input} ? ($V_{\text{p-p}}/2$)**

***Since:**

- **$V_{\text{input}} = 5 \text{ volts}$**
- **CALCULATE $I_{\text{input(peak)}} = V_{\text{input(peak)}} / R$**
- **$I_{\text{input(peak)}} = 5/1000$**
- **$I_{\text{input(peak)}} = 5 \text{ mA}$**
- **CALCULATE $V_{\text{rms}} = V_{\text{peak}} \times 0.707$**
- **$V_{\text{rms}} = 5 \times 0.707$**
- **$V_{\text{rms}} = 3.535 \text{ V}$**
- **CALCULATE $V_{\text{avg}} = V_{\text{peak}} \times 0.636$**
- **$V_{\text{avg}} = 5 \times 0.636$**
- **$V_{\text{average}} = 3.18 \text{ V}$**

*** Now:**

CALCULATE V_p , V_{rms} and V_{avg} of V_{out} when diode is forward biased.



***Since:**

- $V_p = V_{out}$
- $V_p = 4.474 \text{ v}$
- $V_{out} = 4.474 \text{ v}$
- $V_{rms} = 0.707 \times V_p$

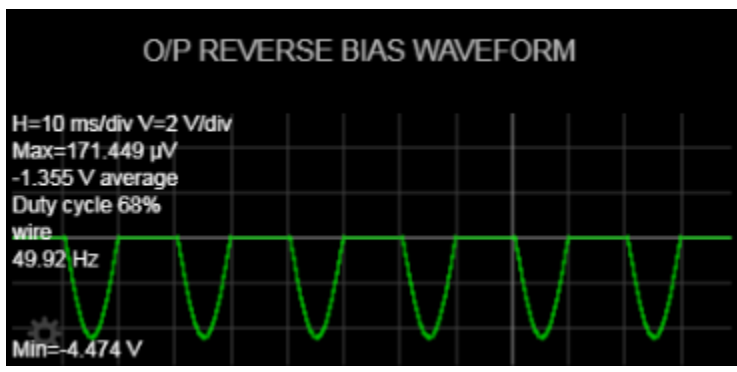
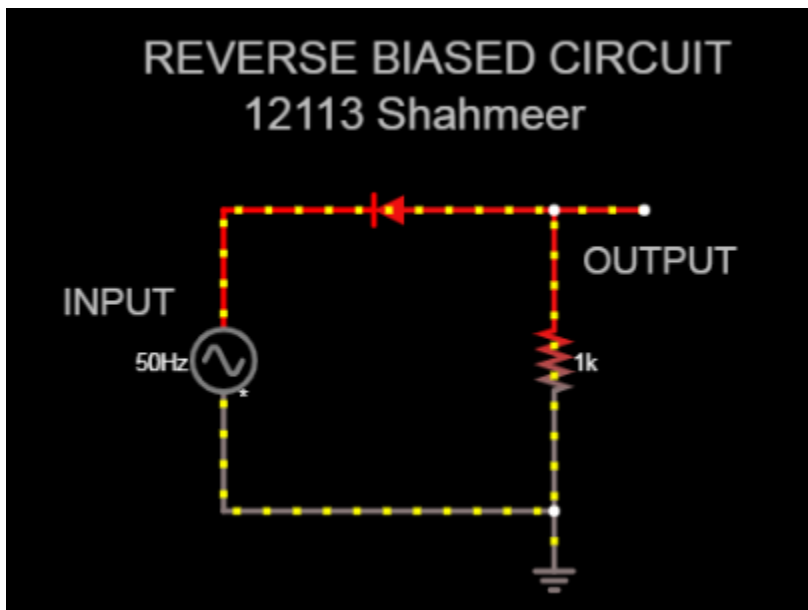
$$V_{rms} = 0.707 \times 4.474$$

$$V_{rms} = 3.163 \text{ v}$$

- $V_{avg} = 0.318 \times V_p$
-
- $V_{avg} = 0.318 \times 4.474$
- $V_{avg} = 1.422 \text{ v}$

Now:

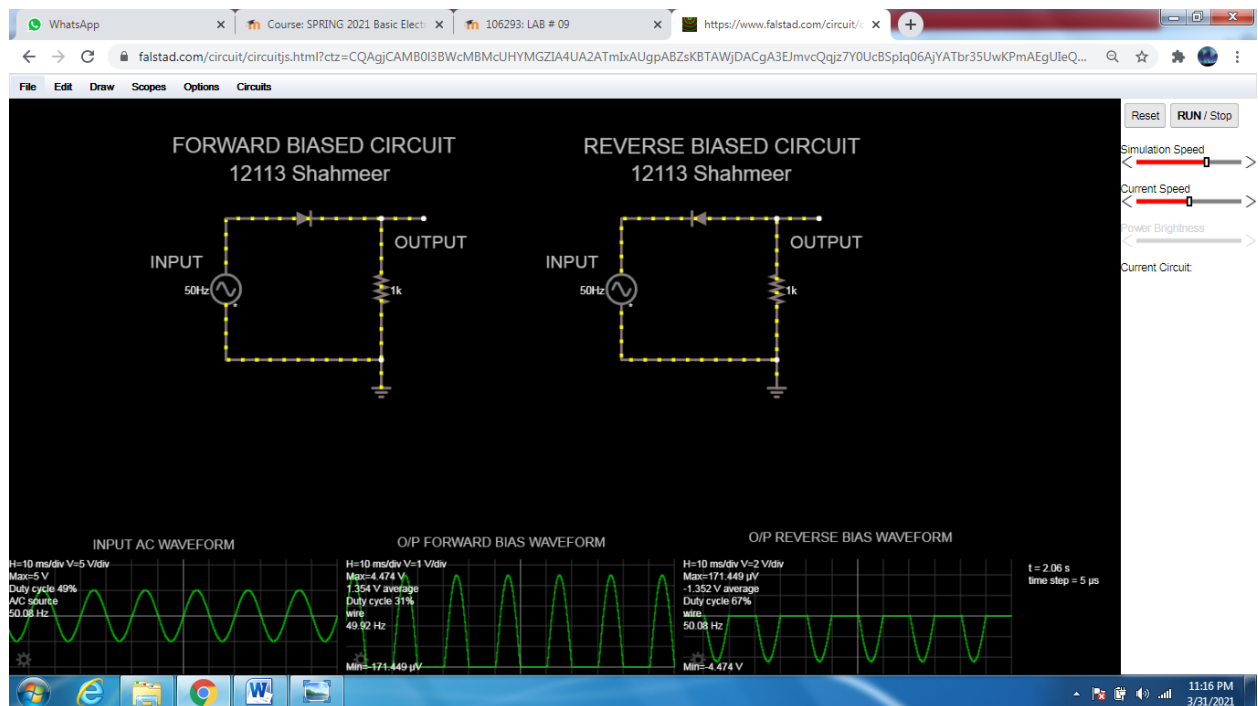
- **CALCULATE V_p , V_{rms} and V_{avg} of V_{out} when diode is reverse biased.**



***Since:**

- $V_p = V_{out}$
- $V_p = 4.474 \text{ v}$
- $V_{out} = 4.474 \text{ v}$
- $V_{rms} = 0.707 \times V_p$
- $V_{rms} = 0.707 \times 4.474$
- $V_{rms} = 3.163 \text{ v}$
- $V_{avg} = 0.318 \times V_p$
- $V_{rms} = 0.318 \times 4.474$
- $V_{rms} = 1.422 \text{ v}$

Whole Circuit SS:



Link of the Simulator:

<https://tinyurl.com/yk5fayyw>