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ECE101-1L – FUNDAMENTALS OF ELECTRONIC CIRCUITS (LAB)

Preliminary Course Assessment

General Instructions:

- Read the questions/instructions carefully (there might be trick questions)
- Communicate within your group only
- Answer the questions/problems honestly

Procedures:

1. Identify the Anode and Cathode of the component shown below (Label each terminal)

   a. left side: Anode , right side: Cathode
   b. left side: Anode , right side: Cathode
   c. left side: Cathode , right side: Anode

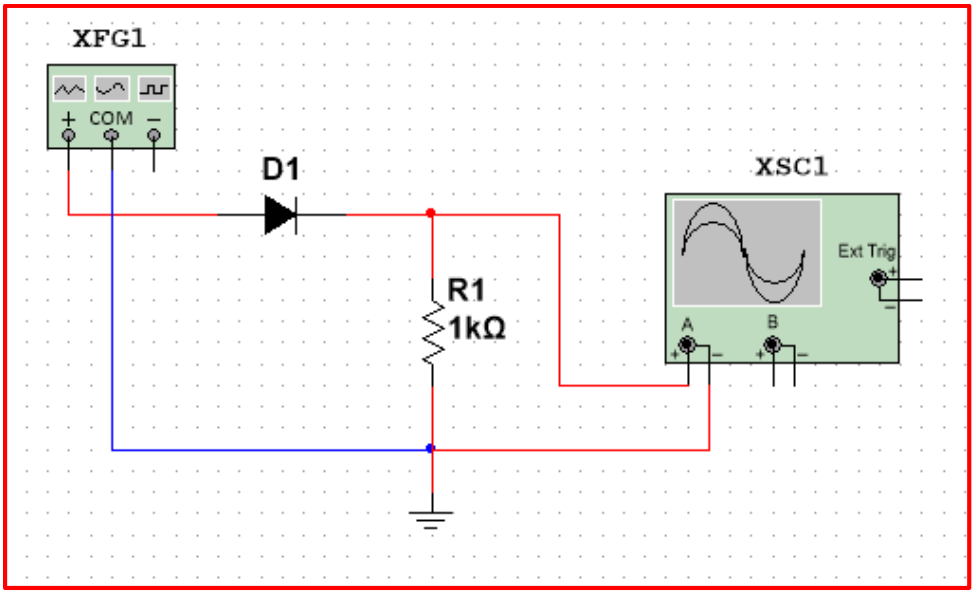
2. Identify if the diode is forward or reverse biased

   a. Forward Biased

b. Reversed Biased

3. Using components shown below (Function generator, Diode, Resistor)

a. Complete the Circuit that will produce a waveform shown below and



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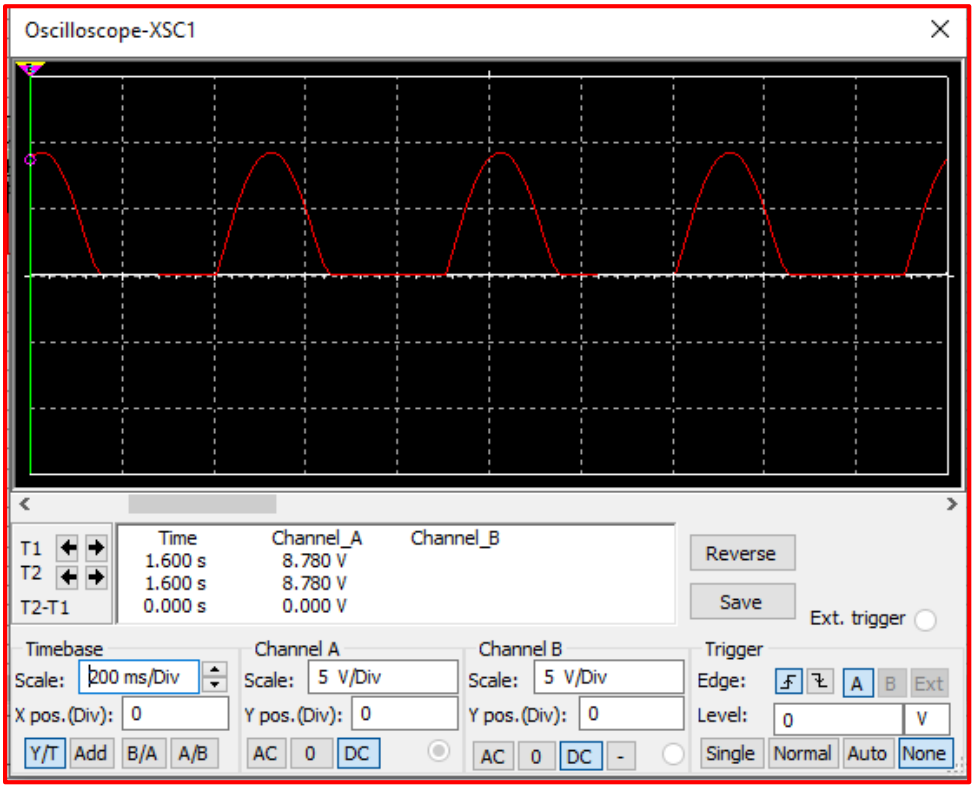
b. Obtain the waveform shown below

Vp = 10V and f = 2kHz



c. Identify what type of circuit in #3.a

Positive Half wave Rectifier

4. Given the diagram shown below

a. Complete the Circuit to Obtain a Full-Wave Pulsating Waveform at the Output

b. Using the values f = 2kHz, Vp = 10V, Use an Oscilloscope to obtain the waveform at the Output R1

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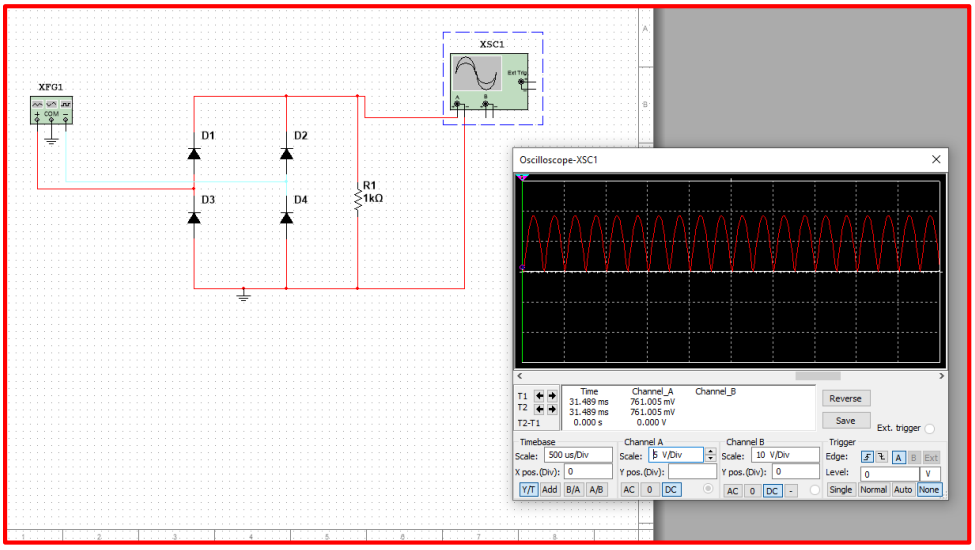
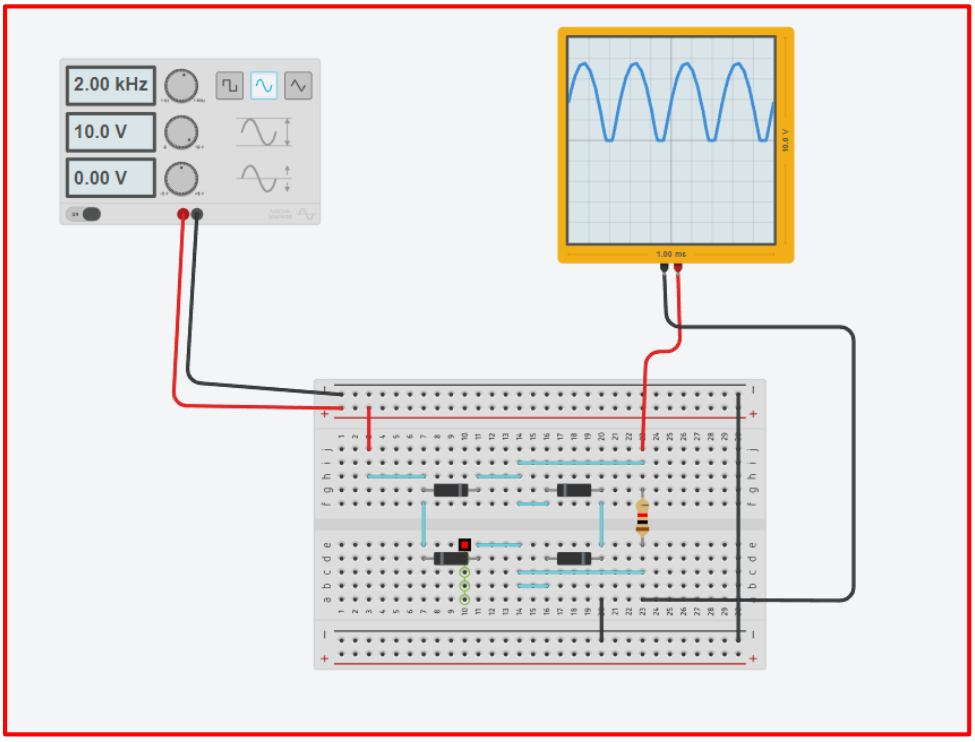


5. Using TinkerCAD

a. Create the similar circuit in #4.a (Screenshot your Circuit)



b. Screenshot the Oscilloscope Output Waveform

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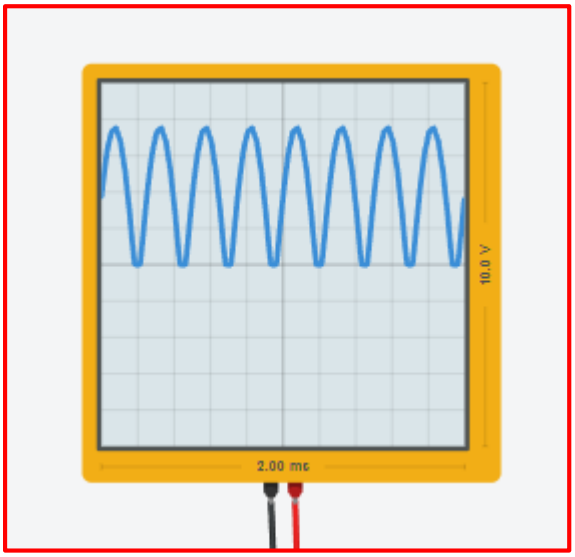
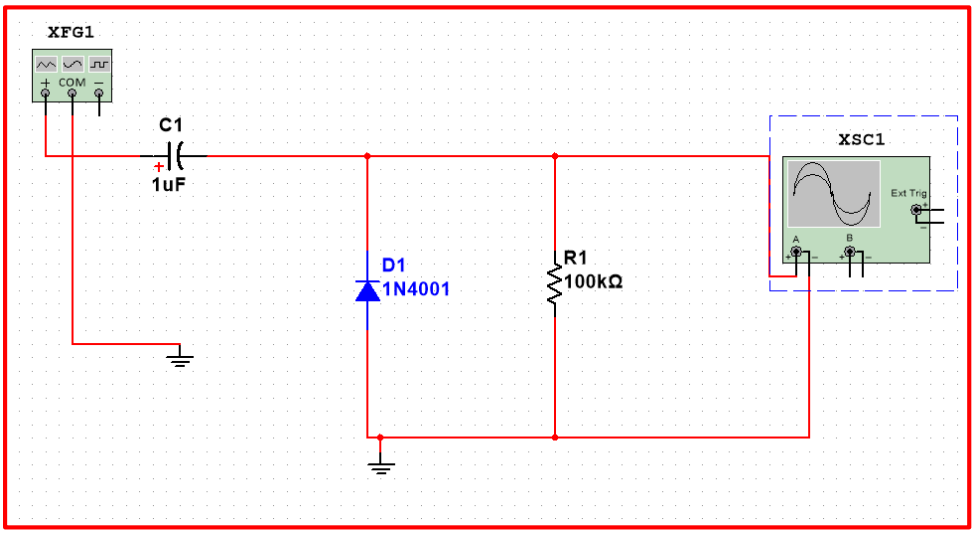


6. Using Multisim

a. Create a Positive Clamper Circuit and screenshot the schematic and Output waveform



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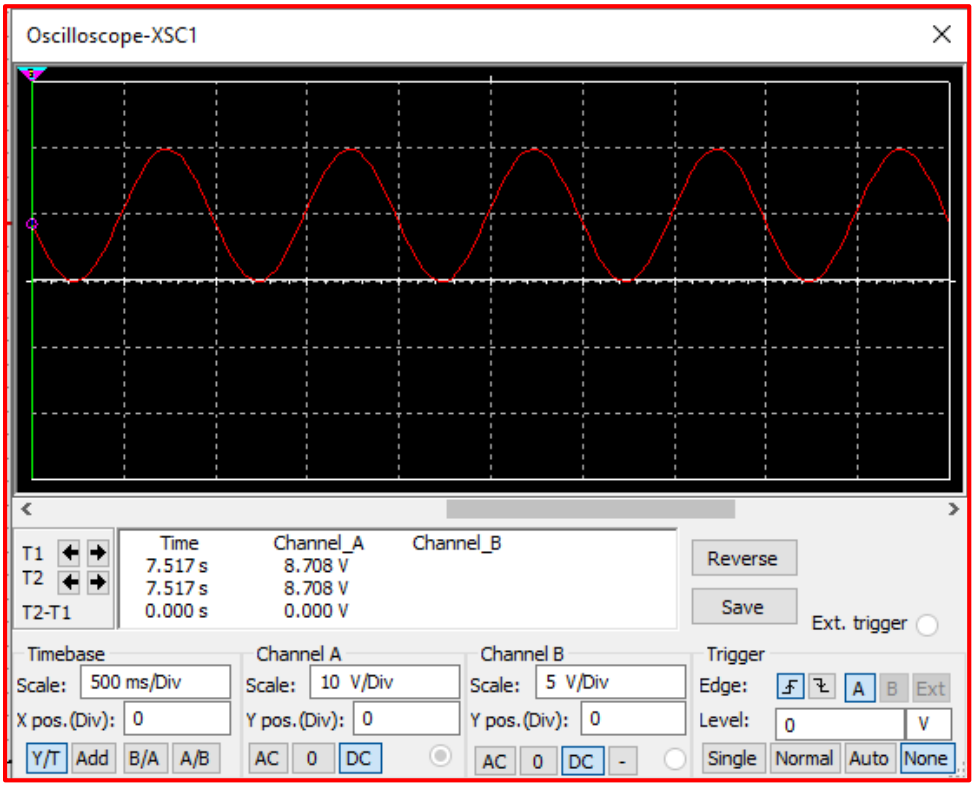
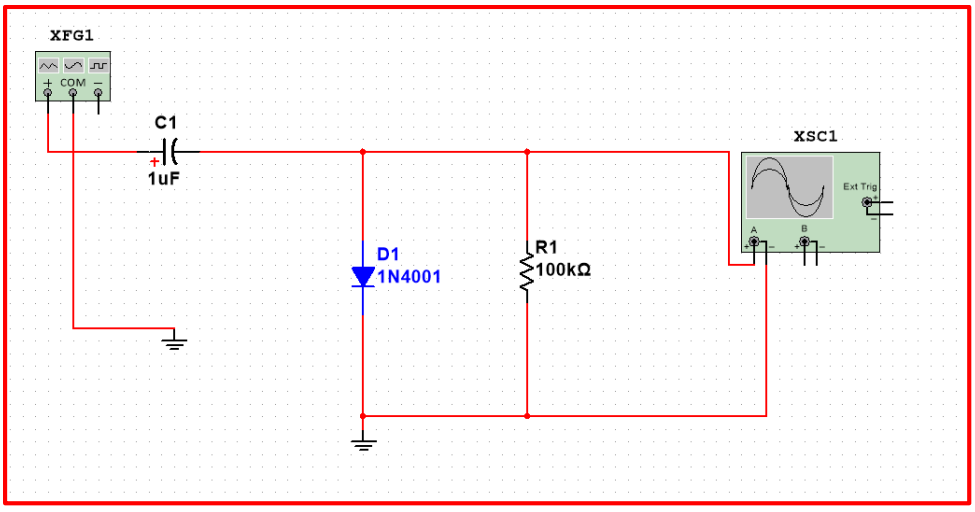


b. Create a Negative Clamper Circuit and screenshot the schematic and Output waveform



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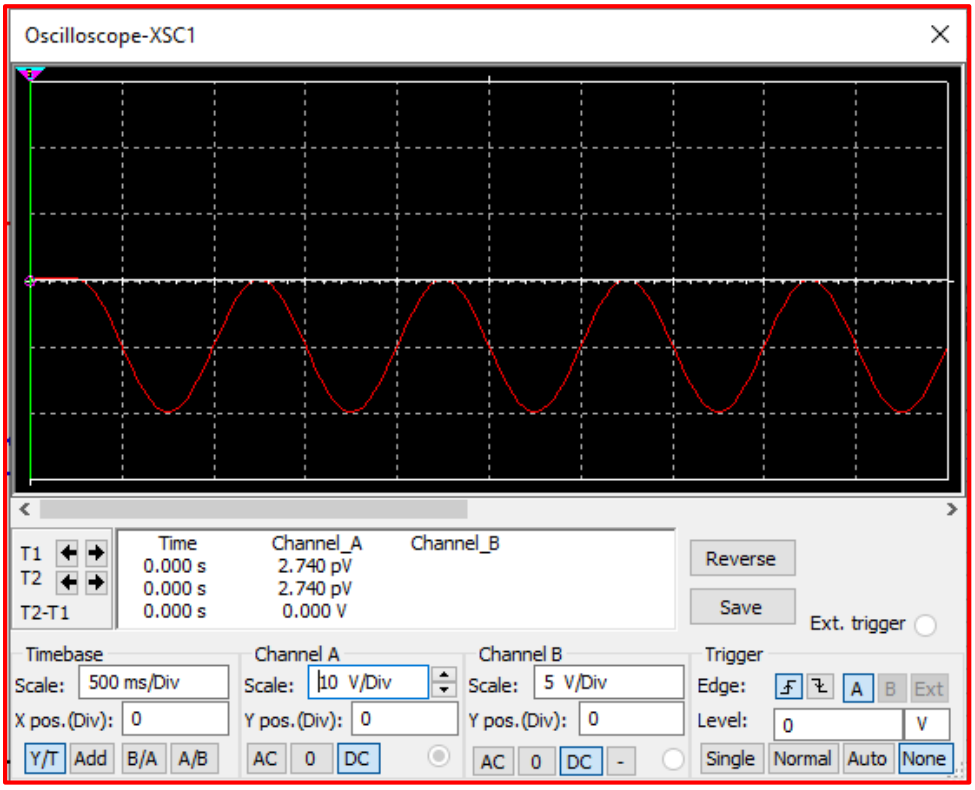
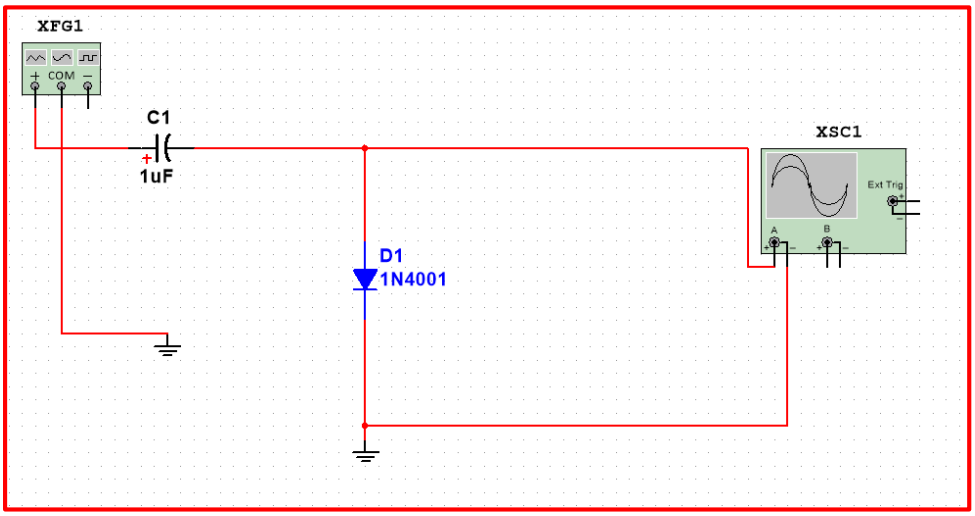


c. Create a Positive Clipper Circuit and screenshot the schematic and Output waveform



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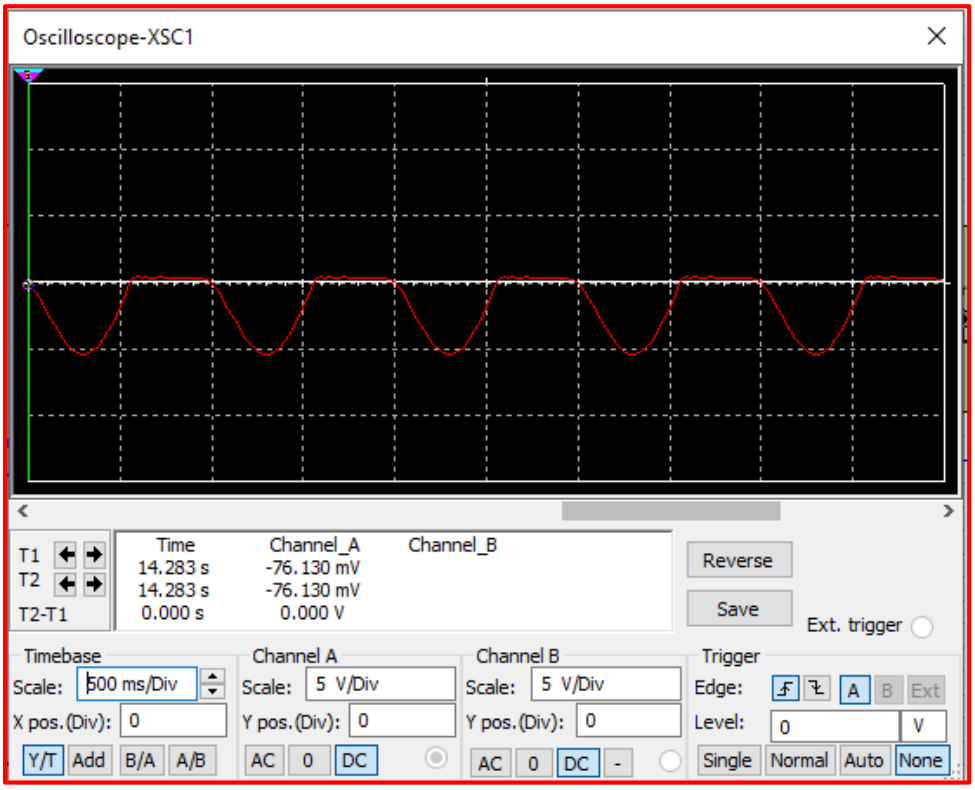
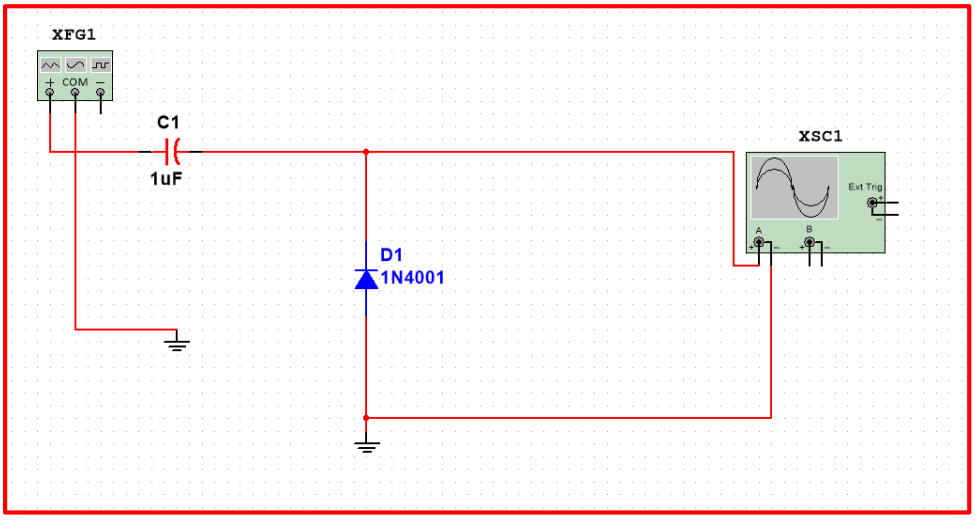


d. Create a Negative Clipper Circuit and screenshot the schematic and Output waveform



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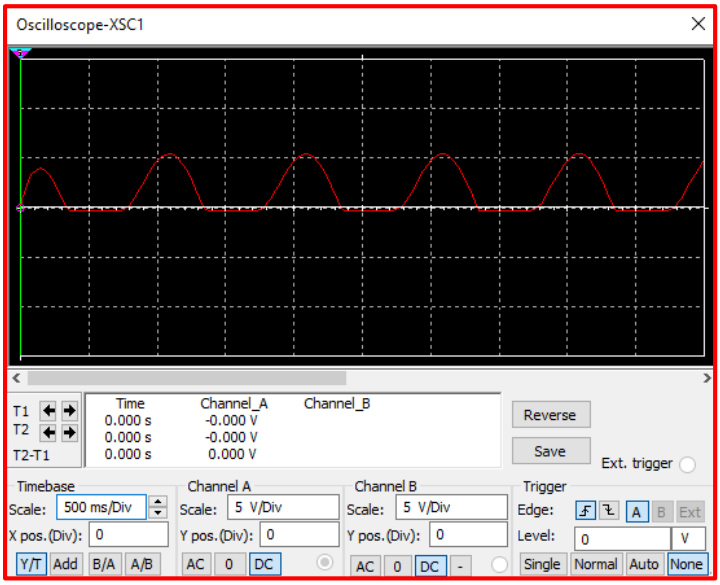
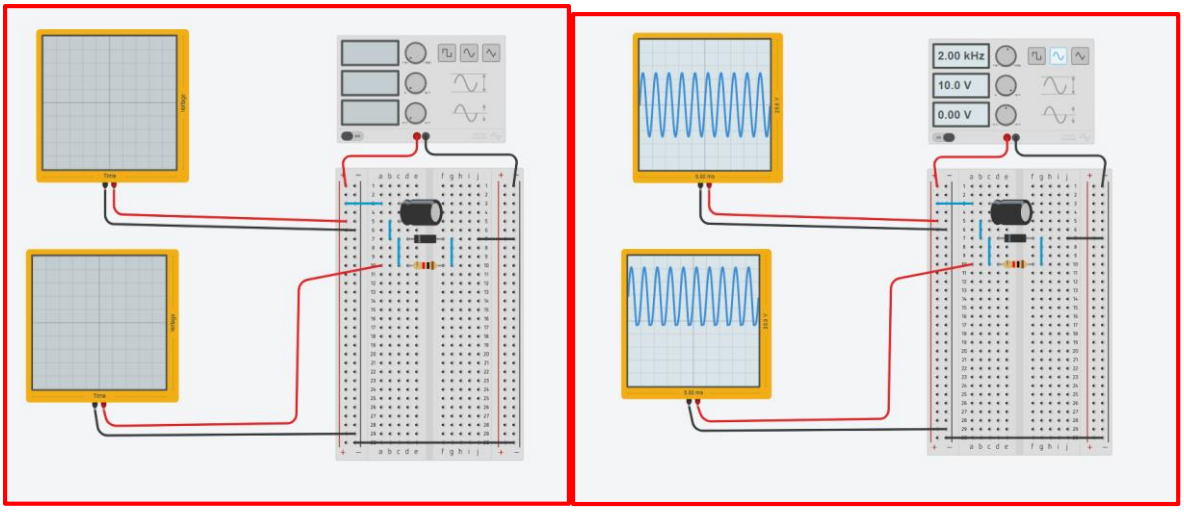


7. Using TinkerCAD

a. Create a Positive Clamper Circuit and screenshot the schematic and Output waveform



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b. Create a Negative Clamper Circuit and screenshot the schematic and Output waveform

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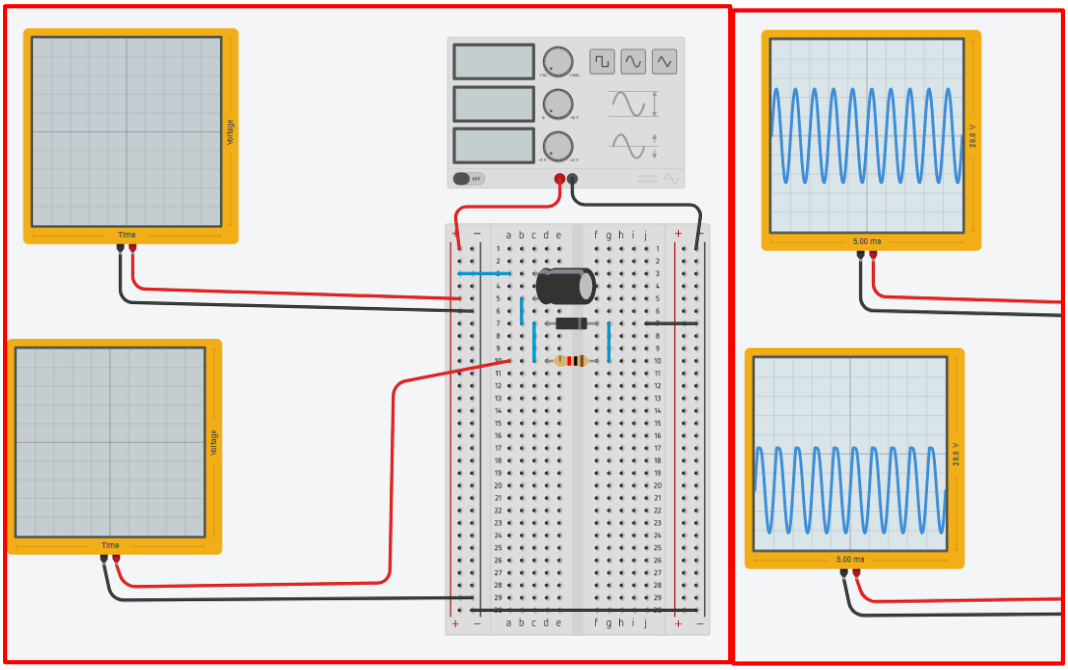

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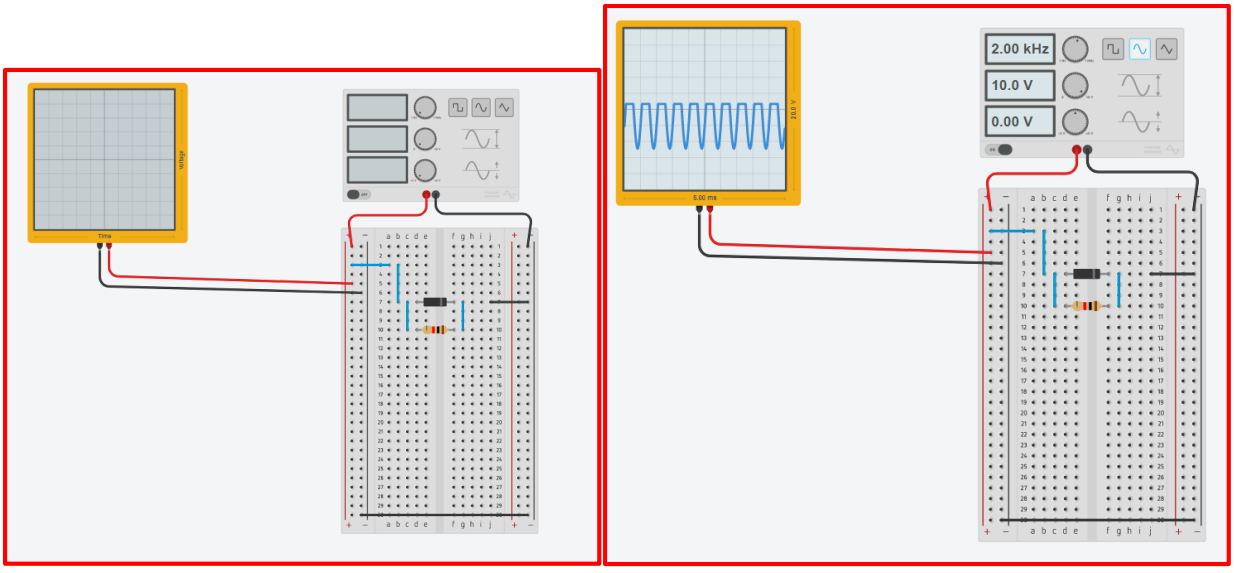

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d. Create a Negative Clipper Circuit and screenshot the schematic and Output waveform

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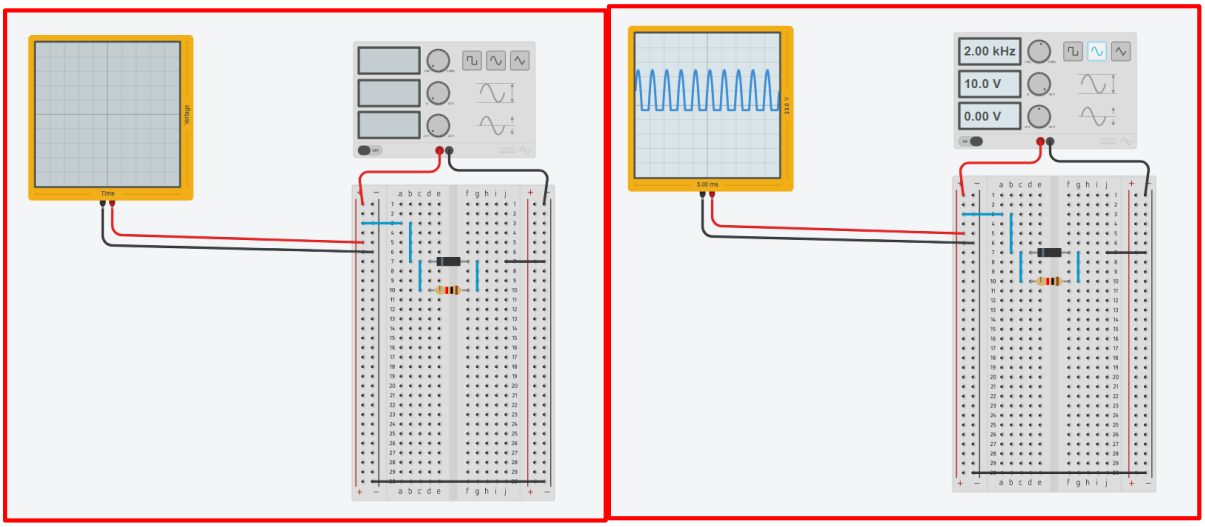

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8. (No need to simulate) Below is a circuit diagram of a DC Power supply with an AC input voltage of 220Vac from the household powerlines. Scale down using a stepdown transformer to 24VAC and used a Full-bridge Rectifier to produce pulsating DC waveform (shown in the oscilloscope). Capacitor is added to create a DC Level Voltage. LED is used for Indicator and Zener Diode at the Output to regulate the voltage output. Consider this circuit fully operational or No Fault and No Losses.

a. What is the Output Voltage at OUTPUT A Zener Diode?

Output A Zener Diode is 5V.

b. What is the Output Voltage at OUTPUT B Zener Diode?

Output B Zener Diode is -5V.