Basic Circuits Simulations and Praticals

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Prepared Using LT spice

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Contents

AIM

To solve the given problems and simulate them using LTspice.

1 PROBLEM A

For the circuit given below, determine the output voltage of the circuit.

Solution

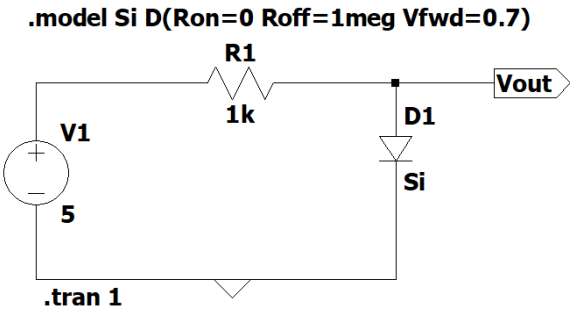

Figure 1: Circuit

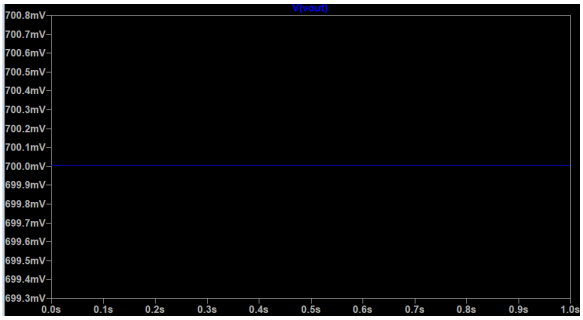

Figure 2: Simulation Output

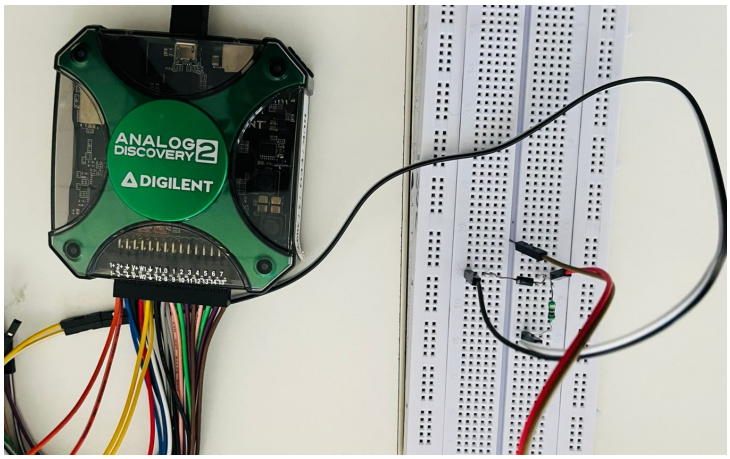

Figure 3: Pratical

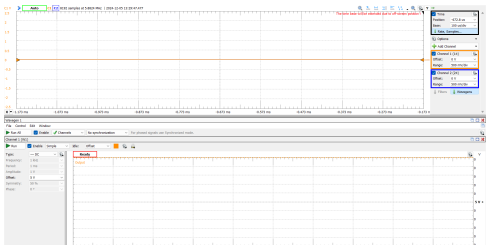

Figure 4: Pratical Output

2 PROBLEM B

For the circuit given below, determine the output voltage of the circuitt.

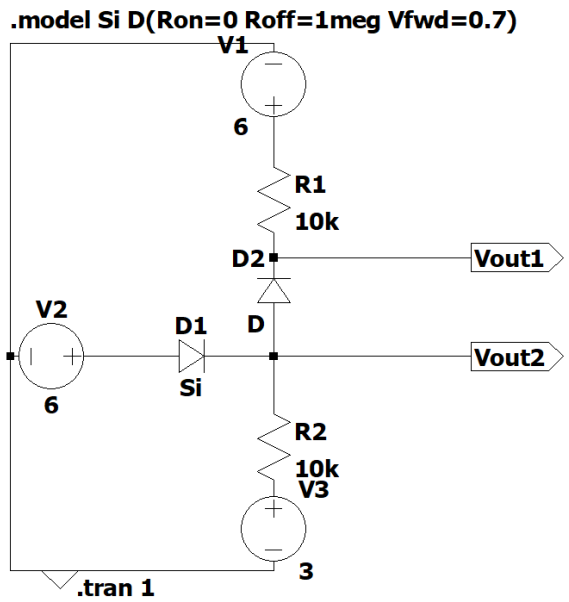

Figure 5: Circuit

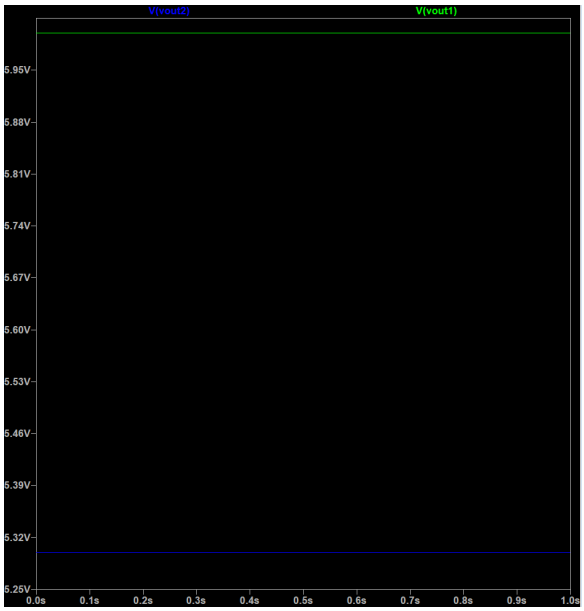

Figure 6: Simulation Output

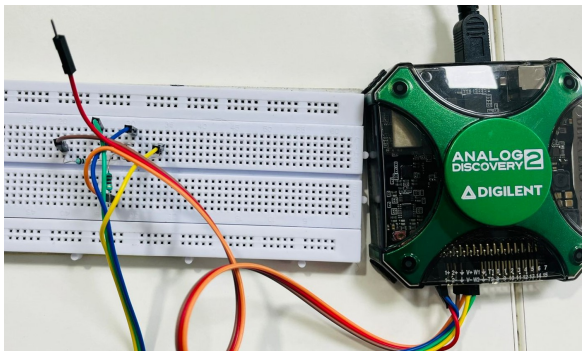

Figure 7: Pratical

3 PROBLEM C

Find the diode states and the values of I and V in the circuit given below.

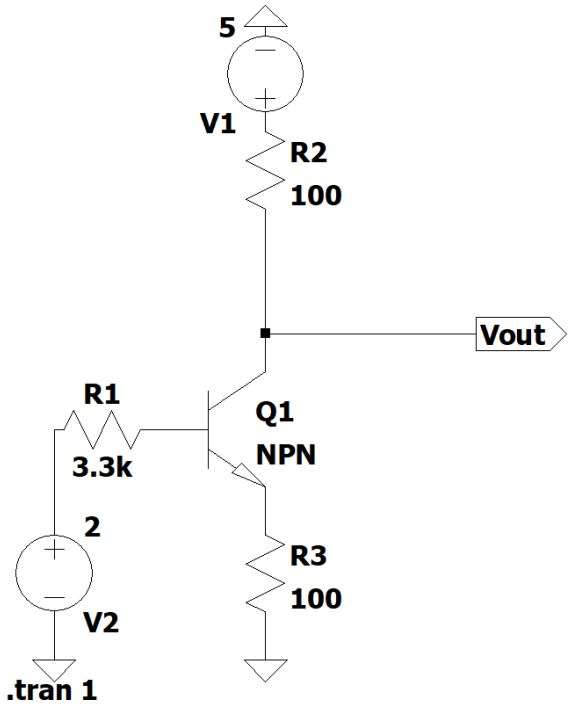

Figure 8: Circuit

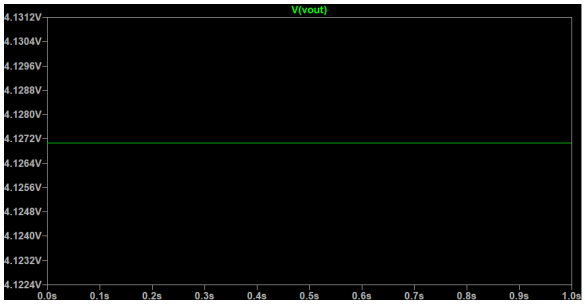

Figure 9: Simulation Output

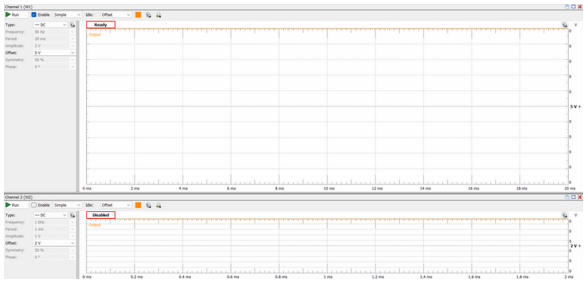

Figure 10: Pratical

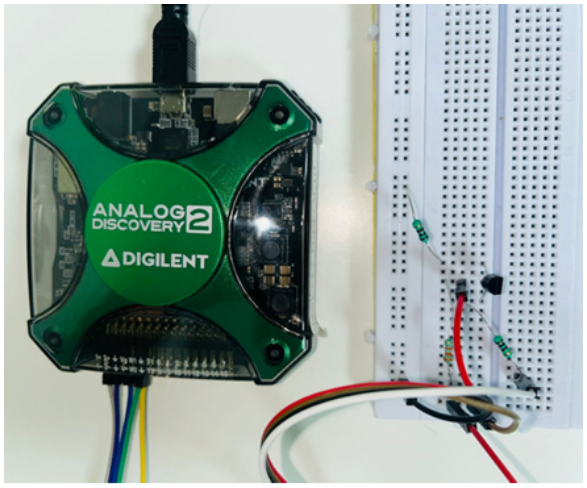

Figure 11: Simulation Output

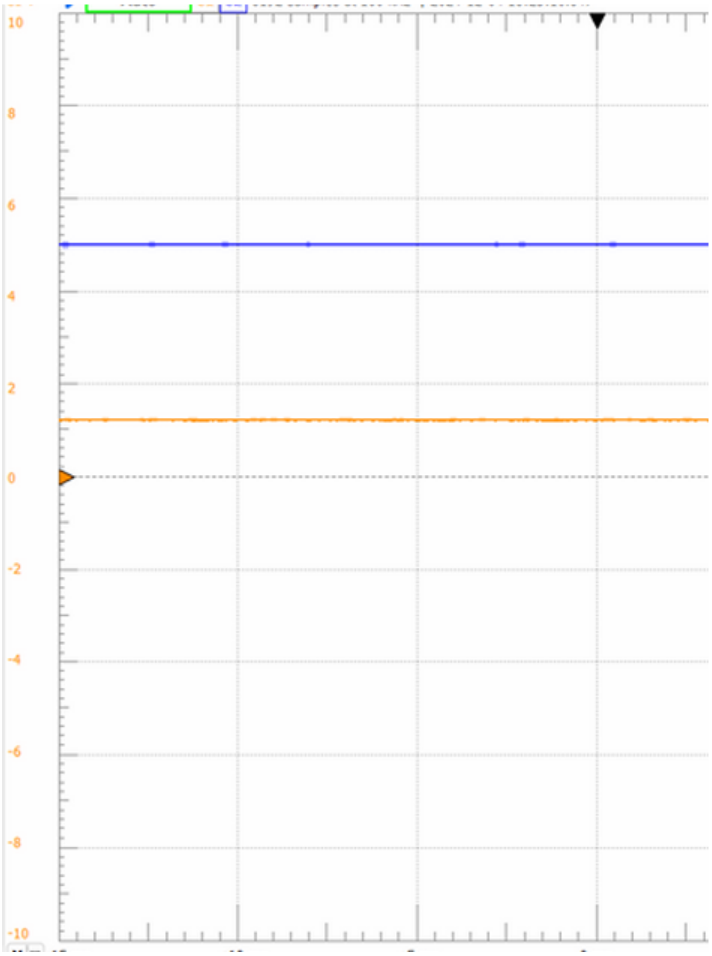

Figure 12: Pratical Output

4 PROBLEM D

For the circuit given below, calculate the output voltage.

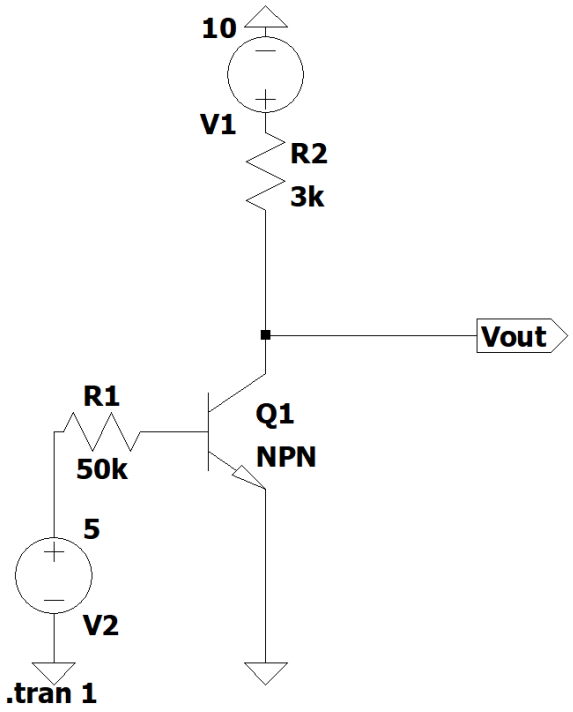

Figure 13: Ciruit

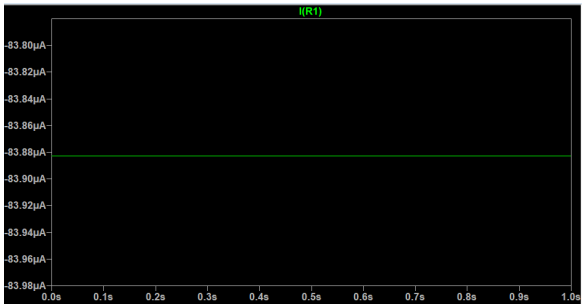

Figure 14: Simulation Output

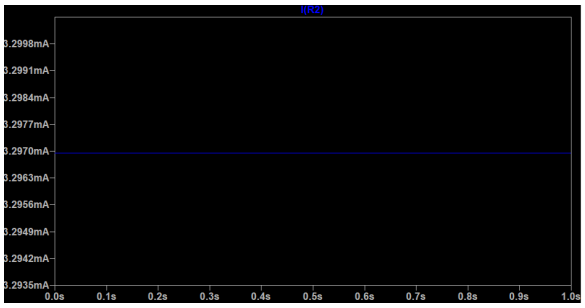

Figure 15: Simulation Output

5 PROBLEM E

For the circuit given below, calculate the output voltage.

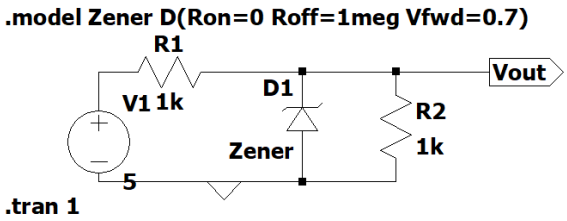

Figure 16: Ciruit

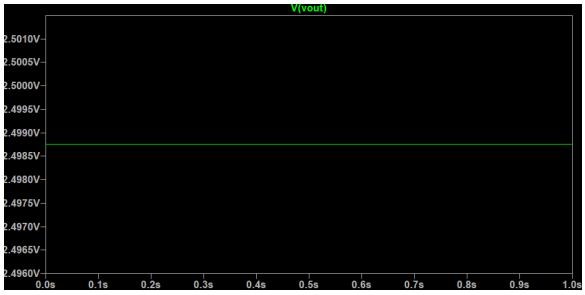

Figure 17: Simulation Output

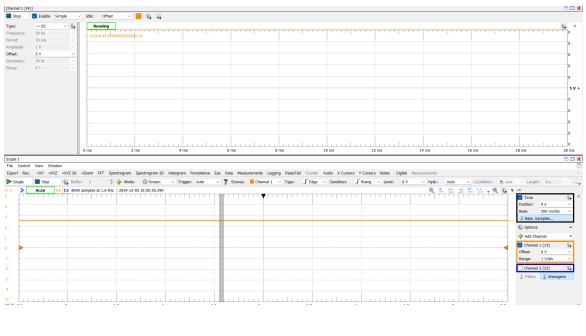

Figure 18: Simulation Output

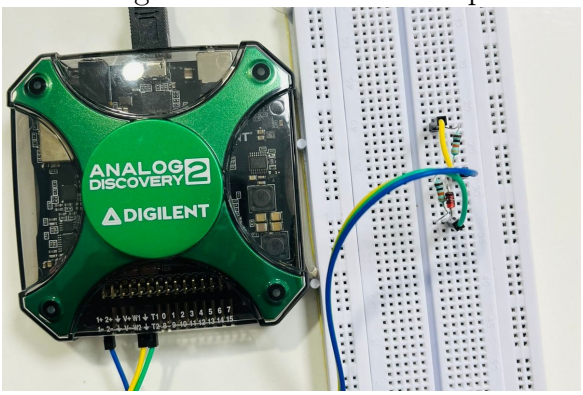

Figure 19: Simulation Output

6 PROBLEM F

Simulate and find the output voltage of the given circuit.

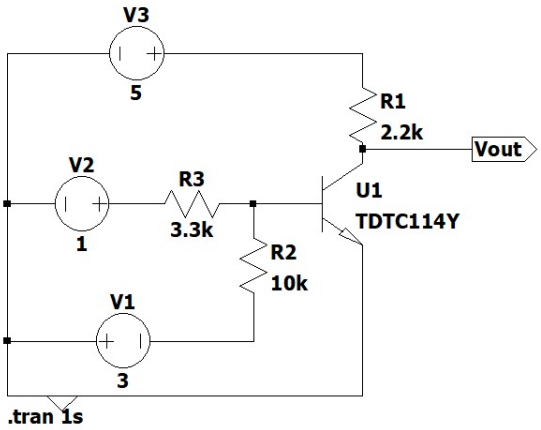

Figure 20: Ciruit

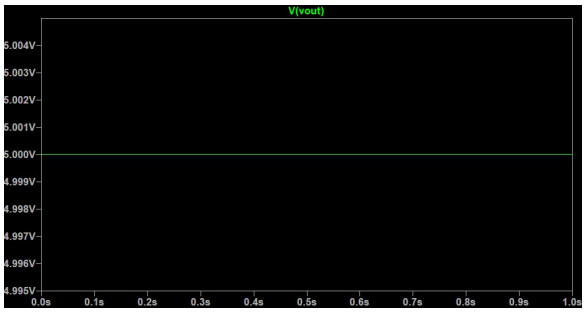

Figure 21: Simulation Output

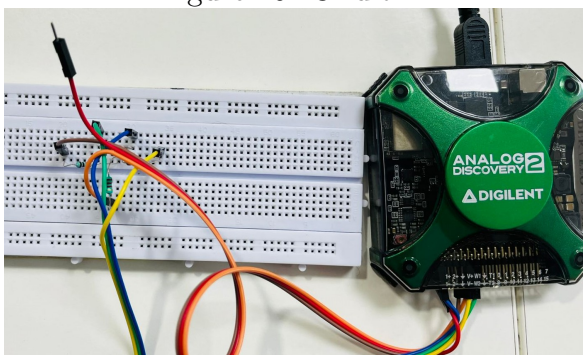

Figure 22: Pratical

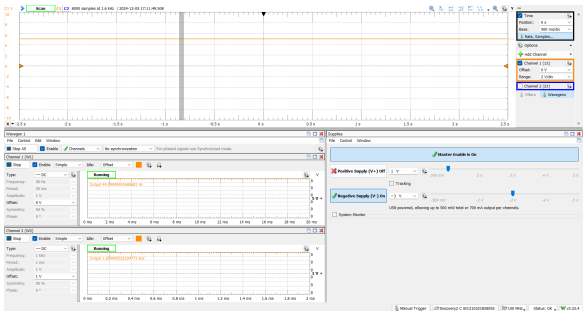

Figure 23: Pratical Output

7 PROBLEM G

Analyze the working of this low pass filter

Solutions

A low pass filter will attunates all the frequency that is about the cut off frequency and pass all the frequency below that

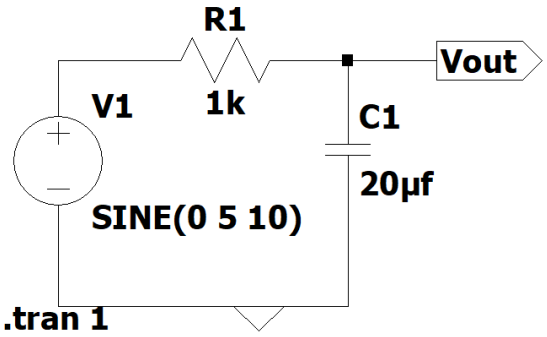

Figure 24: Ciruit

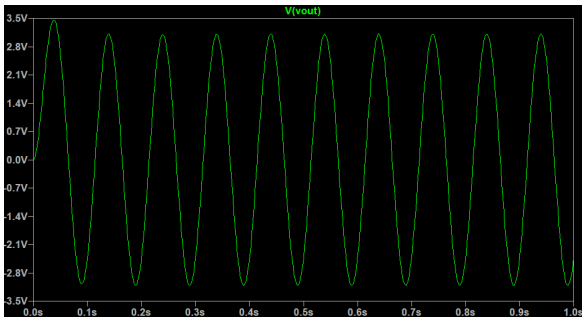

Figure 25: Simulation Output

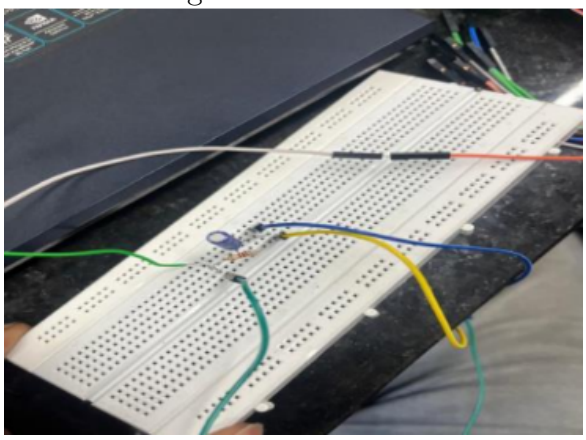

Figure 26: Simulation Output

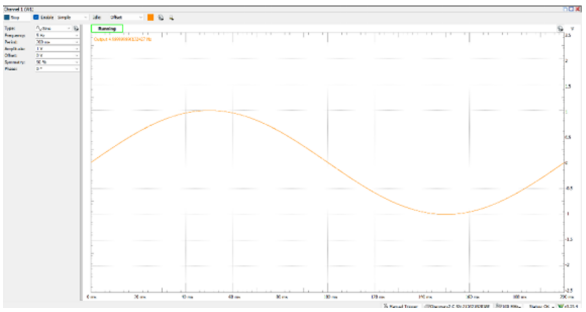

Figure 27: Simulation input

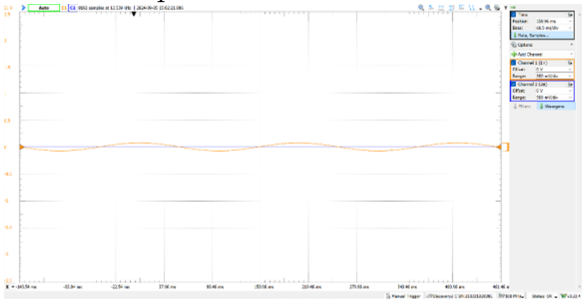

Figure 28: Simulation Output

8 PROBLEM H

Find the output voltage of this given circuit.

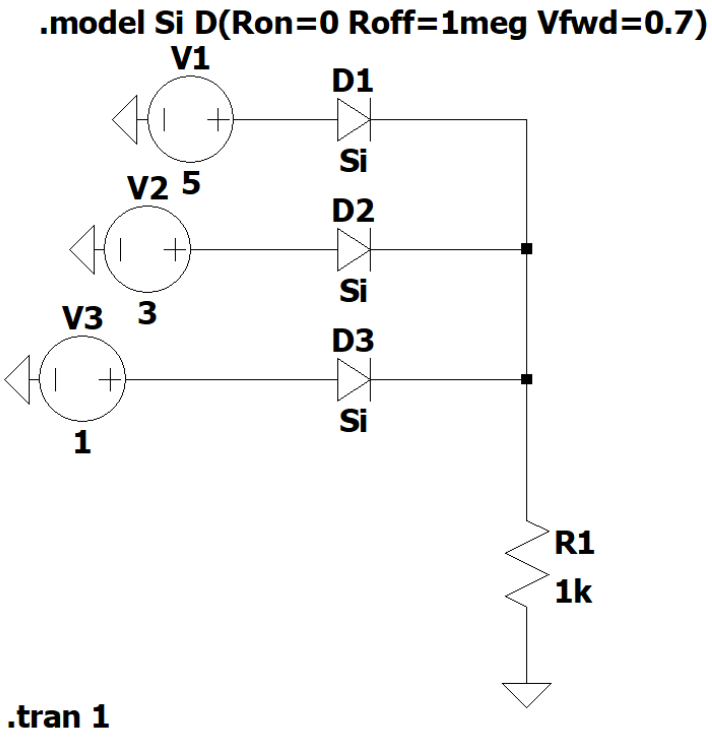

Figure 29: Circuit

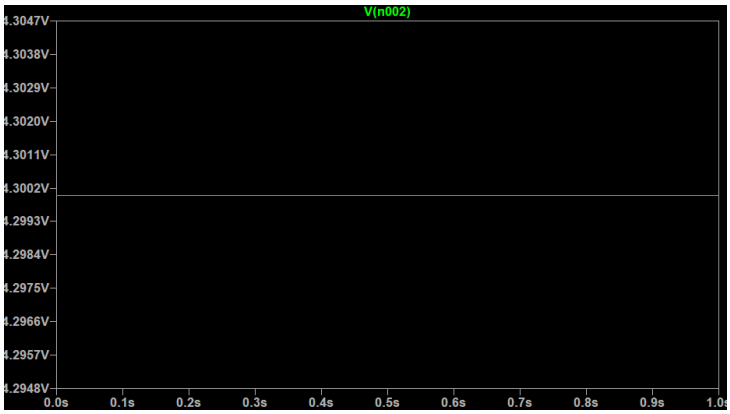

Figure 30: Output

9 PROBLEM I

Design a Positive clipper circuit and show its input and output waveform.

Solutions

A Clipper circuit in which the diode is connected in series to the input signal and that attenuates the positive portions of the waveform, is termed as Positive Clipper.

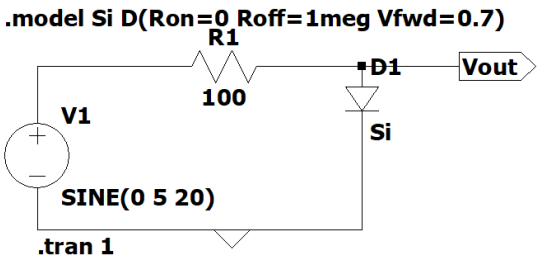

Figure 31: Circuit

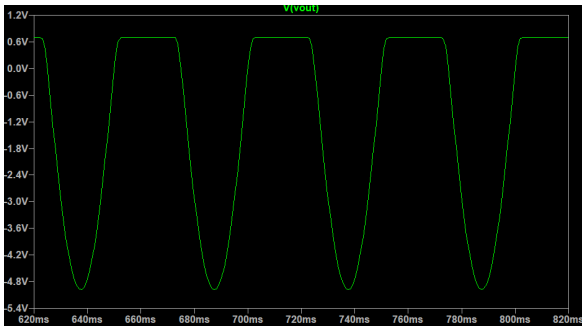

Figure 32: current at collector

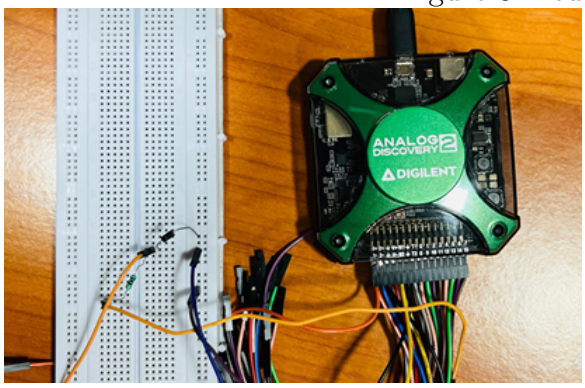

Figure 33: current at collector

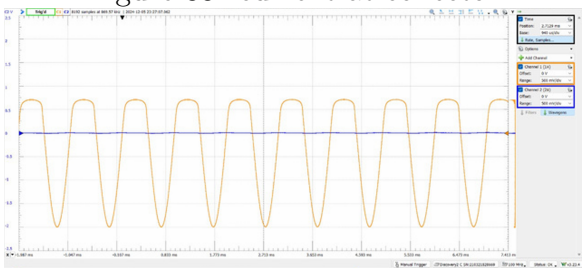

Figure 34: current at collector

10 PROBLEM J

Design a negative clipper circuit and show its input and output waveform.

Solutions

A negative clipper removes the negative portion of an input signal by using a diode and a reference voltage. When the input voltage goes below the reference level, the diode becomes forward-biased, conducting and "clipping" the signal to the reference voltage

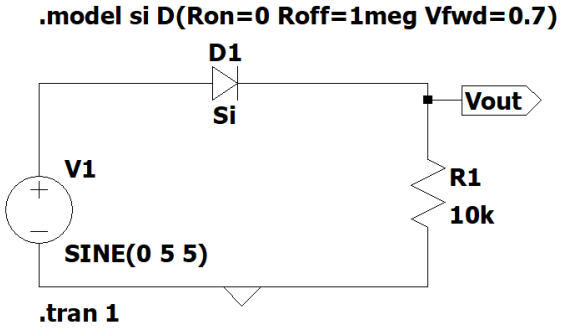

Figure 35: Circuits

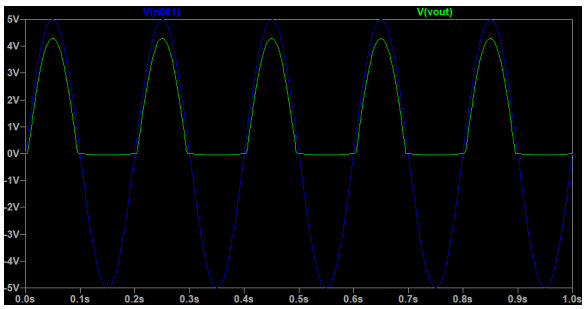

Figure 36: Simulation output

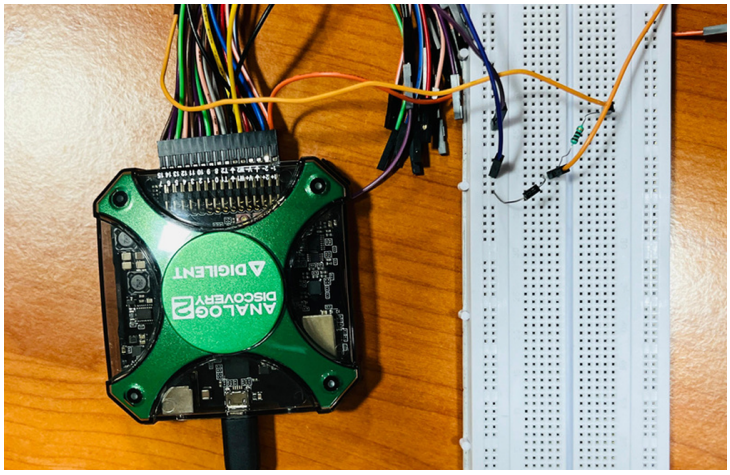

Figure 37: Pratical

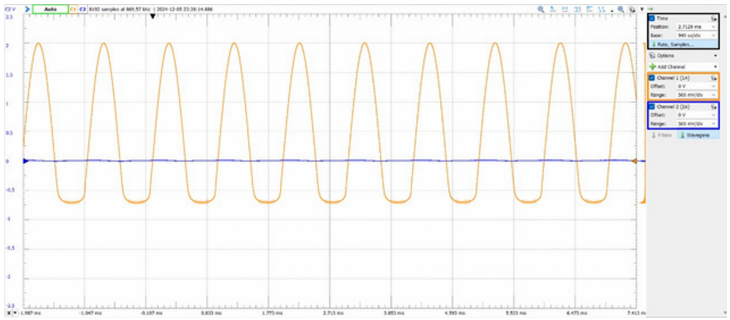

Figure 38: Pratical output