Lab Report 2

Team Members :

Name: Chanda Akshay Kumar

Roll No. : 2024102014

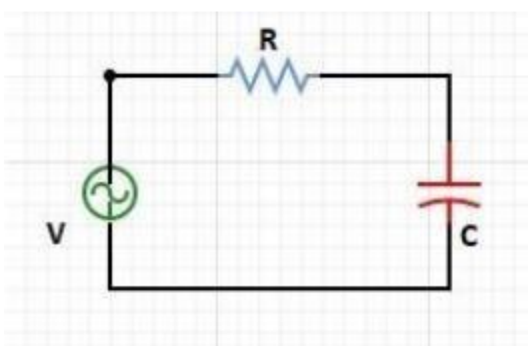
Name: Samadhi Venkata Santhosh Kumar yadav

Roll No.: 2024102054

Team I'D : 42

Aim/Objective:

Implementing RC Circuit on PCB



Materials Used:

1. Capacitor
2. Power Supply
3. PCB(new)
4. Resistors
5. Digital Multimeter
6. Soldering kit(Including flux,lead,etc…)
7. Connecting wires
8. DSO (Digital Storage Oscillator) & Wave Generator

Procedure:

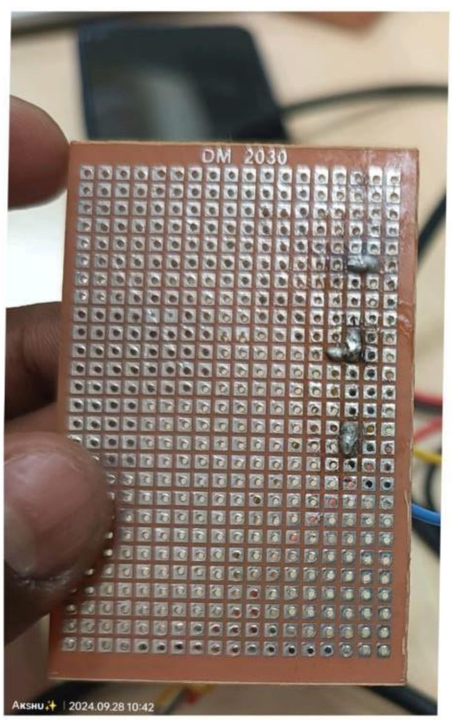
1. Identify all the components of your RC circuit: resistor(s), capacitor(s), and any input/output connections.

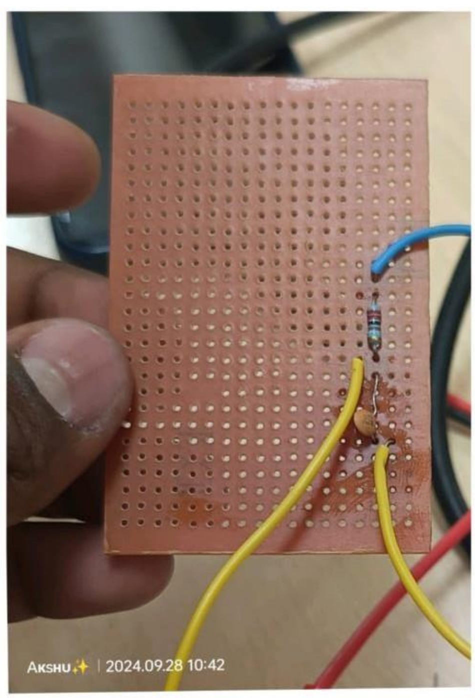
Sr No	R (in ohms)	C (in farad/microfarad)	Time Constant (Theoretical)	Time Constant (Practical)	Cutoff Frequency (Theoretical)	Cutoff Frequency (Practical)
1	2190 ohm	457×10^{-12} farad	10^{-6} s	0.78×10^{-6} s	0.16×10^{6} hz	0.2×10^{6} hz
2	11600 ohm	10^{-9} farad	11.6×10^{-6}	14.7×10^{-6}	13.7×10^{3}hz	10×10^{3}hz
3						

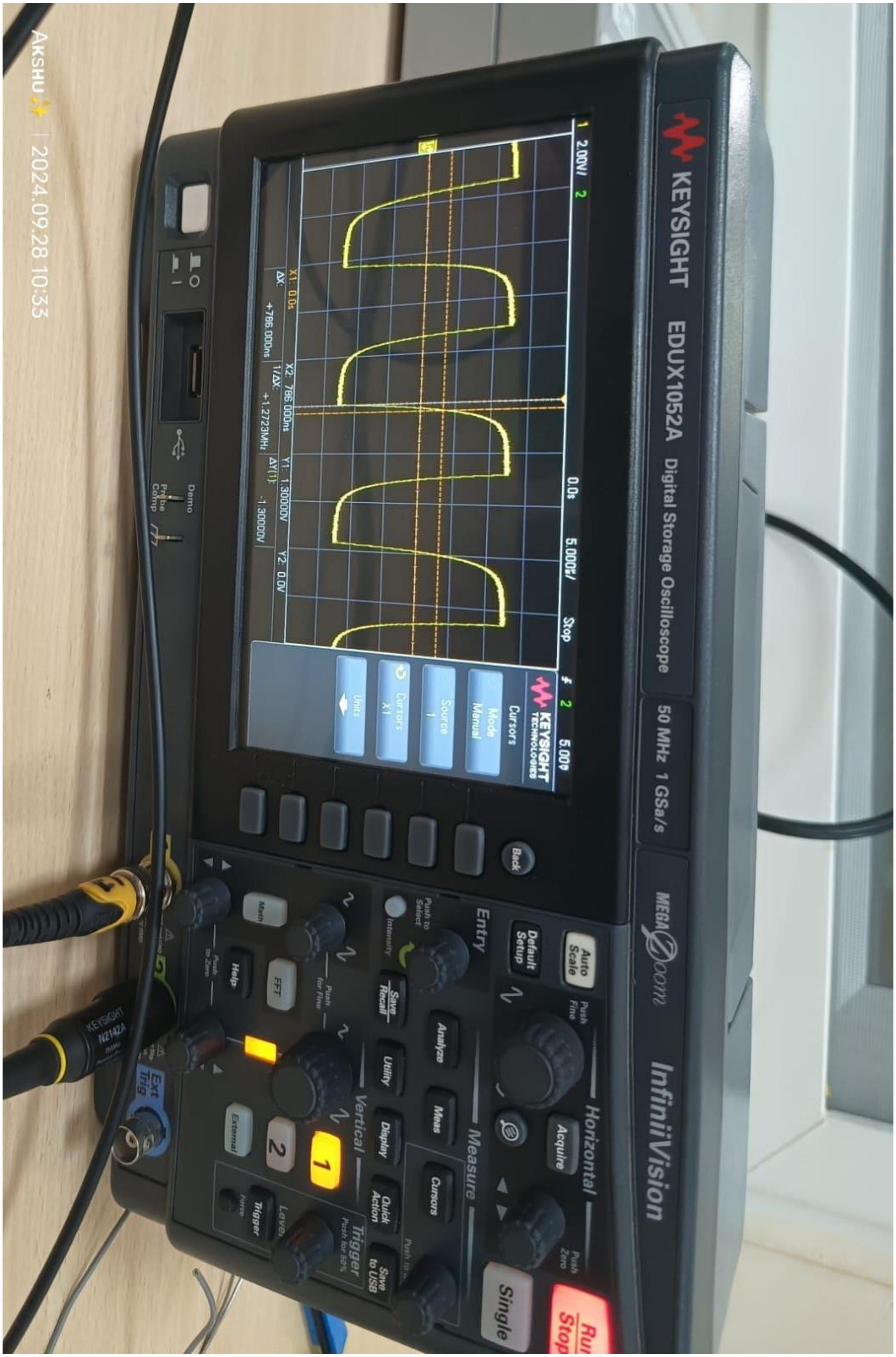
2. Place the components on the PCB according to the circuit diagram, ensuring that polarized components (like electrolytic capacitors) are oriented correctly.
3. Solder each component to the PCB, starting with the lowest profile components (usually resistors) and working your way up to taller components.
4. After soldering, visually inspect each joint for good, shiny connections, and check for any solder bridges between adjacent pads.
5. Once all components are soldered, use a multimeter to check for continuity and correct resistance values. Connect the circuit to your function generator and oscilloscope to verify its operation.
6. If the circuit doesn't work as expected, recheck your connections and component values. Use the oscilloscope to trace the signal through the circuit and identify any issues.
7. Then follow the same experiment 1 had done in 1st lab with the circuit constructed before,
8. Note the values by obtained signal in DSO.

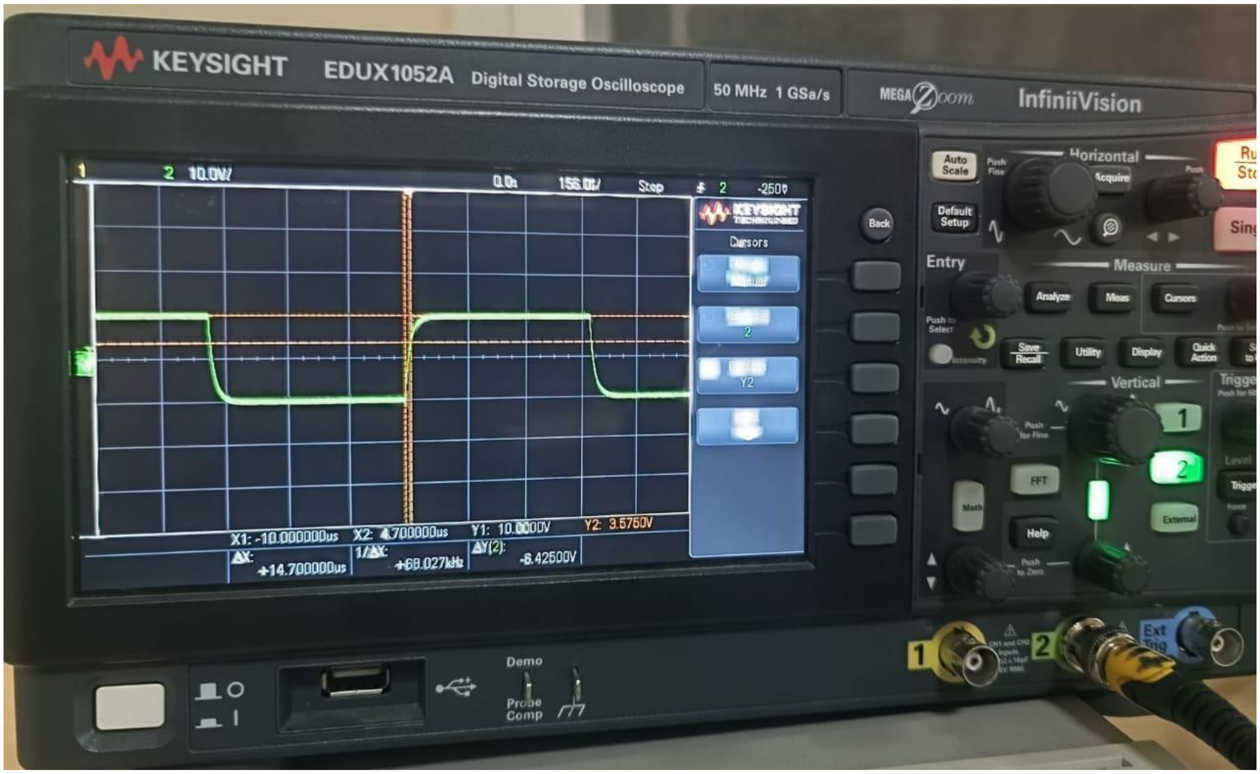
Observation Result and Table

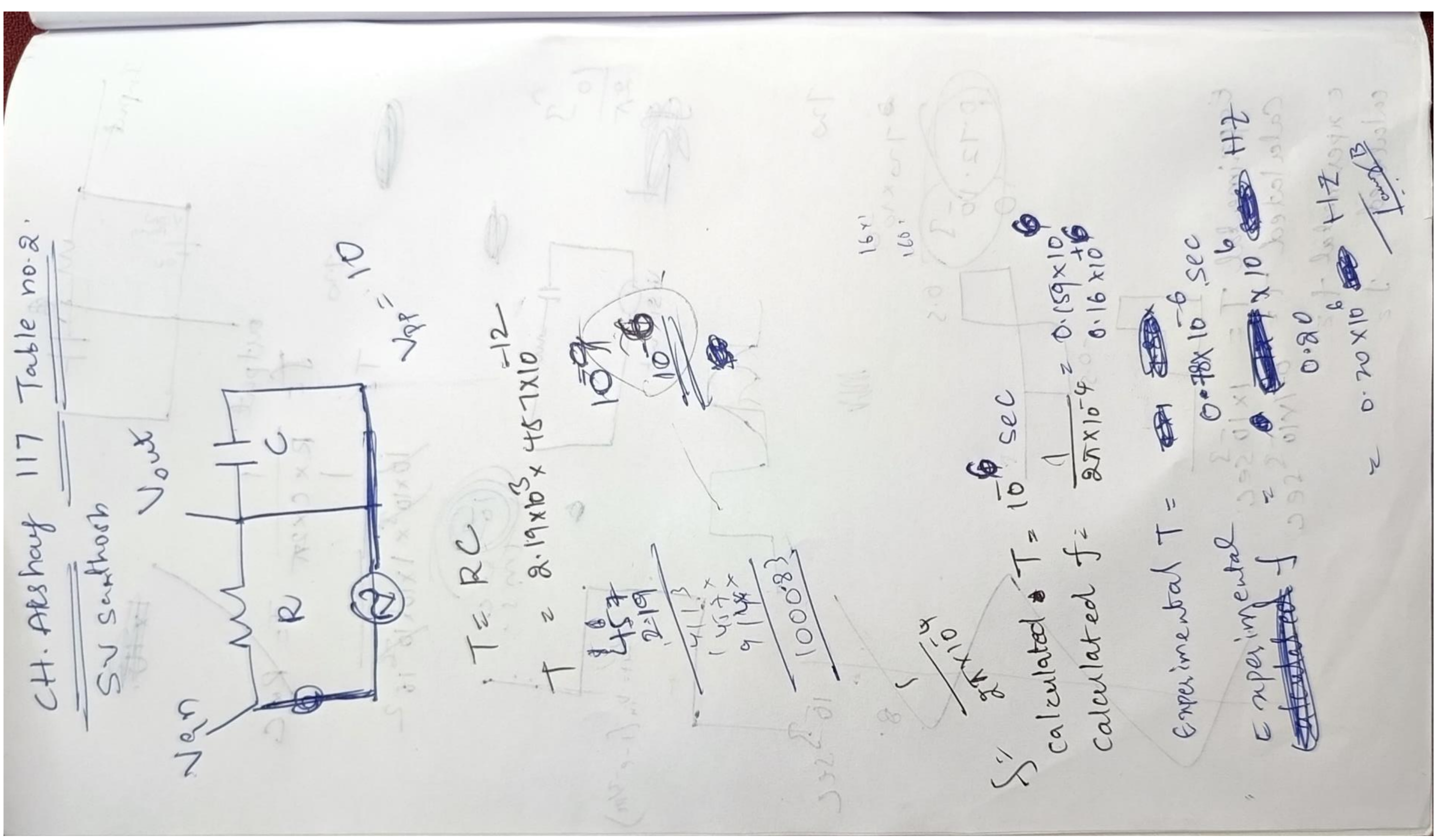
PCB & DSO IMAGE

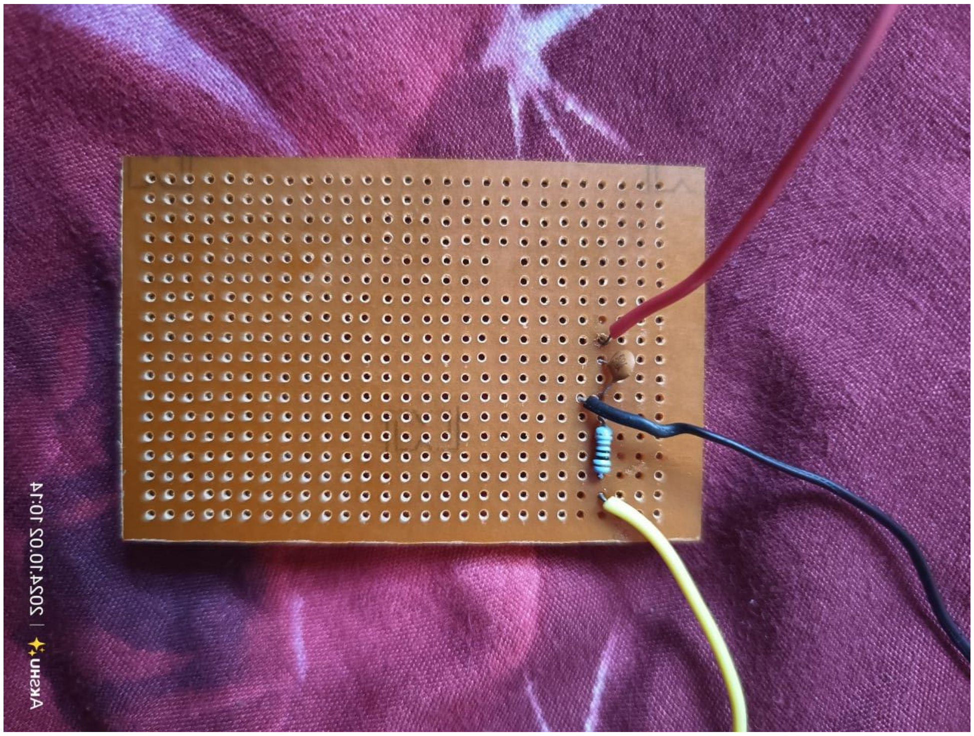





AKSHU | 2024.09.28 10:33
KEYSIGHT
EDUX1052A Digital Storage Oscilloscope
50 MHz 1 GSa/s
InfiniiVision
2.00V/
0.0s
5.000s/
Stop
X1: 0.0s
X2: 786.000ns
Y1: 1.30000V
Y2: 0.0V
ΔX: +786.000ns
1/ΔX: +1.2723MHz
ΔY(1): -1.30000V
Cursors
Mode Manual
Source 1
Cursors X1
Units
Back
Auto Scale
Default Setup
Horizontal
Acquire
Entry
Measure
Analyze
Meas
Cursors
Save Recall
Utility
Display
Quick Action
Save to USB
Vertical
Math
FFT
Help
External
Trigger
Level
Single
Run Stop
Ext Trig
Demo
Probe Comp


KEYSIGHT
EDUX1052A Digital Storage Oscilloscope
50 MHz 1 GSa/s
InfiniiVision
X1: -10.000000us
X2: 4.700000us
Y1: 10.0000V
Y2: 3.5750V
ΔX: +14.700000us
1/ΔX: +68.027kHz
ΔY(2): -6.42500V


CH. Akshay 117 Table no. 2
S.V Santhosh
Vin
Vout
R
C
Vpp = 10
T = RC
Calculated T = 10^-6 sec
Calculated f =
Experimental T =
Experimental f



Conclusion:

constructing the RC circuit on a PCB involved properly placing and soldering components to test the circuit for time constant and cutoff frequency. We replicated the charging and discharging behavior of the capacitor using a square wave, as observed in the breadboard experiment. The overall goal was to determine the time constant and cutoff frequency in the PCB version of the circuit.