# Introduction to DSO and Breadboard

## Introduction

The basic idea behind an oscilloscope when it was developed was that we wanted to analyze any electrical signal of our interest in the form of graph/plot. Hence an oscilloscope has two axes marked on its display: one in horizontal direction and the other in vertical direction.

Earlier Cathode Ray Oscilloscopes (CRO) were used that had CRT (Cathode Ray Tube) in it, which was used to generate a beam of electrons and this beam, if collides with a screen, produces a light spot. CRT contains horizontal and vertical plates & electron beam is passed between them. By applying a suitable potential across these plates, we can deflect the electron beams which in turn will deflect the spot on the CRT screen which will trace out a waveform. Hence the spot on the screen is having combined resultant 2D motion.

Now DSO (Digital storage oscilloscope) is the next development in this line where we are doing the same 2D plot of X Vs Y by taking the inputs across its X and Y channels and processing it digitally and reconstructing the waveform on the display within a nano second time approximately.

DSO has following advantages in comparison with analog oscilloscopes:

1. It can save waveforms and settings in its internal memory as well as external drives.
2. It can perform various mathematical operations on the signals.
3. It can be interfaced with PC or printer to give us the printout of outputs.
4. It can display various measurement parameters of a waveform.
5. It can be used to monitor a signal at a very low frequency.

Please go through the user manual for details :- Manual

## Aim

## (A) Procedure for performing experiment on breadboard (RC Circuit )

1. Connect the circuit as shown in Fig 1.1 below on breadboard
2. Apply Sin using a function generator.
3. Observe the trace or record (wherever possible) the waveform across capacitor appearing on the DSO screen.
4. Note the value of voltage at t=RC.
5. Observe the waveform for 3 different combinations of R and C and note down the results as mentioned in the table below.

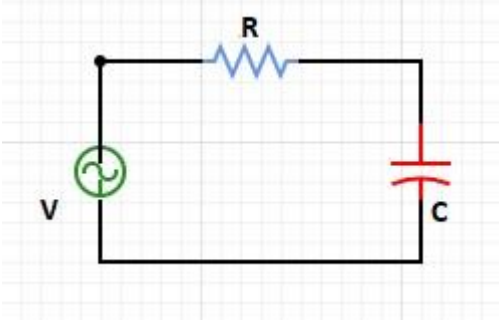

Fig 1.1 : RC Circuit

1. R=..... C=..... Cuttoff Frequency =.....

| S.No | Frequency | Vin | Vout |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**(B) Breadboard:**

The circuit to be studied will have to be assembled on the breadboard. **Fig. 1.2** shows the schematic of the breadboard. It has 128 vertical strips, 64 on each side of the horizontal divider in the middle, each strip consisting of 5 spring-loaded tie-points internally connected to one another. Each connection among the circuit components is made with the help of tie-points connected on the same strip. The breadboard also has 8 horizontal strips, four on the top side and 4 on the bottom side, each having 25 tie-points. These strips are generally used for making power supply connections.

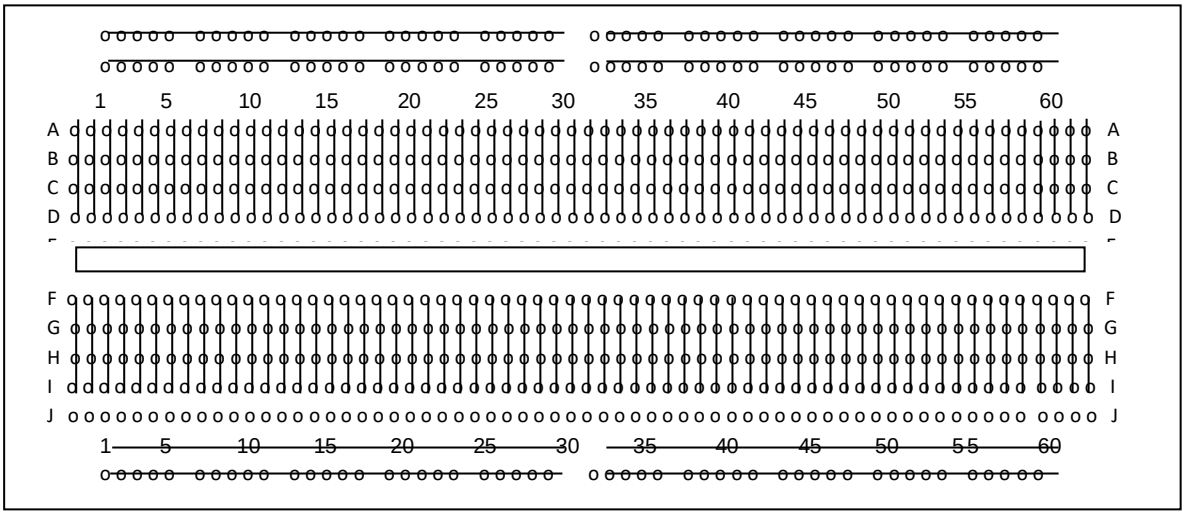


Fig. 1.2 : Breadboard Schematic