



VIVEKANAND EDUCATION SOCIETY'S
INSTITUTE OF TECHNOLOGY

Approved by AICTE & Affiliated to Mumbai
University



ELECTRONIC AND ELECTRICAL MEASURING INSTRUMENTS
AND MACHINES

MINI PROJECT REPORT

Project Title: Phase Measurement on Cro

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AIM: Measurement of Phase Using Cro

APPARATUS: CRO, breadboard, connecting wires, cro probes,

Capacitor – $0.01\mu\text{f}$

Resistor – $5\text{k}\Omega$

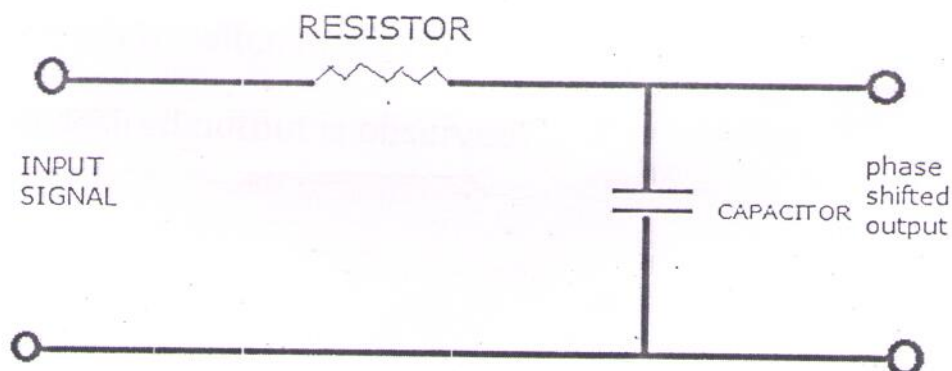
THEORY:

An oscilloscope can be used to measure a phase change in a given input signal.

For such purpose what we require is to operate the cro in the x-y mode.

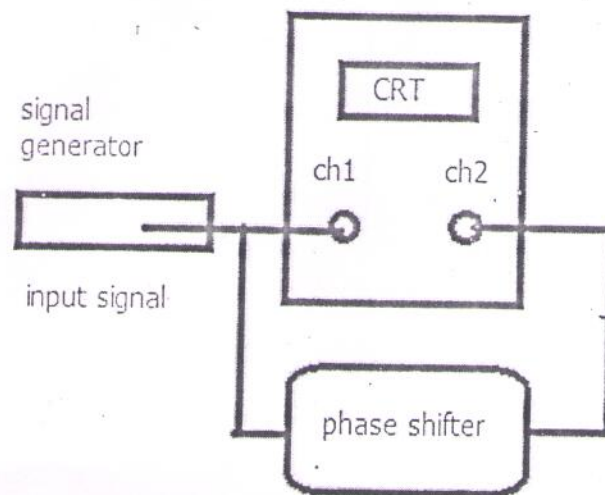
In cro an x-y mode is one in which the horizontal amplifier input is from another channel say b and not from the saw tooth generator.

To get a phase shift what we require is a simple r-c network as shown below:



CIRCUIT ARRANGEMENT:

The circuit arrangement to observe the phase shifted o/p on cro is as follows:



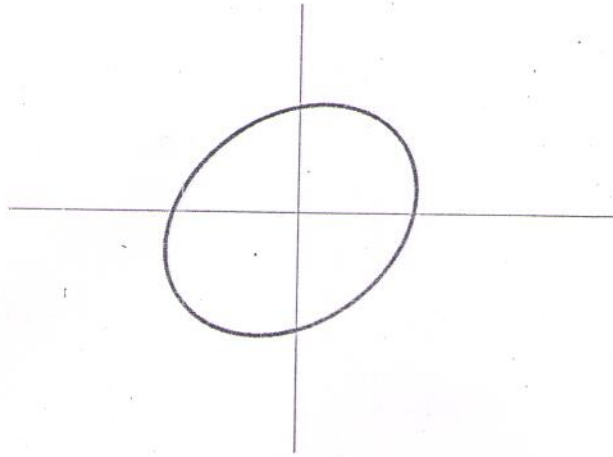
As shown above, the input coming from the signal generator is connected to the ch1 of the cro as well as to the input of the r-c n/w.

Then the o/p of the rc phase shifting n/w is connected to the ch2 of cro.

Then the cro is switched input the x-y mode.

And the desired output is observed.

The output observed should be as follows:



CALCULATION AND OBSERVATION:

1. THEORETICAL:

To calculate the theoretical phase with the values

$R = 5\text{k}\Omega$, $C = 0.01\mu\text{f}$ AND $f = 1\text{kHz}$

THEN,

2. PRACTICALLY:

$$\theta = \sin^{-1}\left(\frac{y_1}{y_2}\right)$$

What we observed on cro is:

$$Y_1 = 0.9 \text{ and } Y_2 = 1$$

Thus we get,

$$\theta = 64.15^\circ$$

CONCLUSION:

Thus we observe the phase difference of the input signal on cro practically and also calculate the phase difference theoretical.

The values of theoretical and practical phase were observed to be very close to each other.