**Objective:** To study the RC Phase Shift Oscillator.

Resources Required: Trainer kit of RC Phase Shift Oscillator.

Thoery :

RC phase-shift oscillators use resistor-capacitor (RC) network (Figure 1) to provide the phase-shift required by the feedback signal. They have excellent frequency stability and can yield a pure sine wave for a wide range of loads. Ideally a simple RC network is expected to have an output which leads the input by $90°$. However, in reality, the phase-difference will be less than this as the capacitor used in the circuit cannot be ideal. Mathematically the phase angle of the RC network is expressed as $\varphi = tan^{-1}(X_c/R)$.

Where, $X_C = 1/(2\pi fC)$ is the reactance of the capacitor C and R is the resistor. In oscillators, these kind of RC phase-shift networks, each offering a definite phase-shift can be cascaded so as to satisfy the phase-shift condition led by the Barkhausen Criterion. Here the collector resistor RC limits the collector current of the transistor, resistors R1 and R (nearest to the transistor) form the voltage divider network while the emitter resistor RE improves the stability. Next, the capacitors CE and Co are the emitter by-pass capacitor and the output DC decoupling capacitor, respectively. Further, the circuit also shows three RC networks employed in the feedback path.

Circuit Diagram :
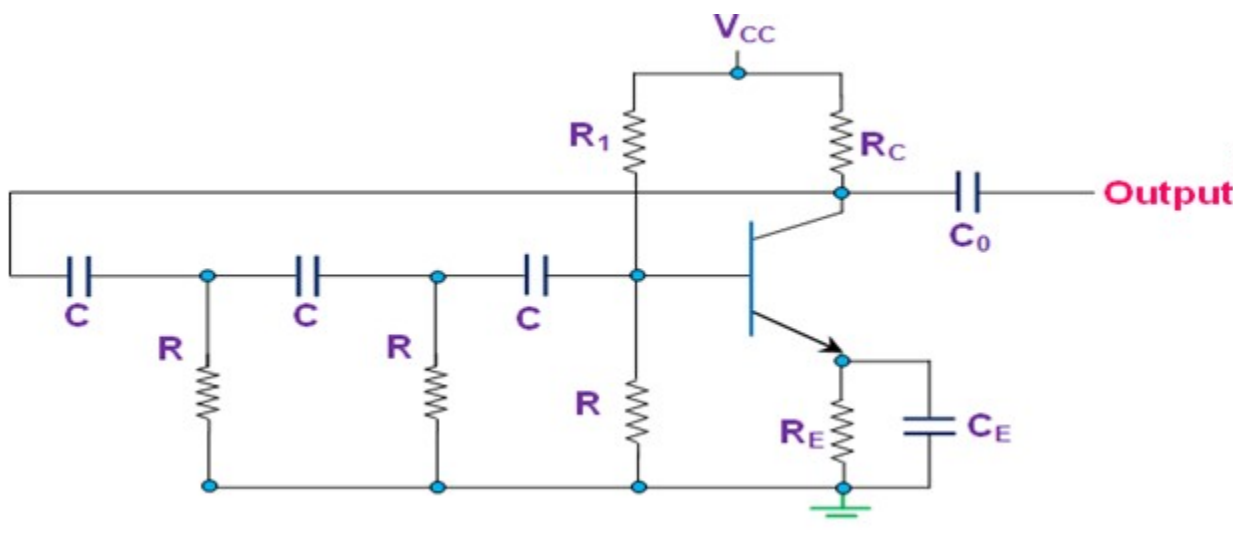
Fig: RC Phase Shift Oscillator

Procedure:-

1. We should take all the components for this experiment.

2. Make the connection as per circuit diagram.

3. Switch ON the kit using ON/OFF toggle switch

4. The input signal is applied with the function geneator

5. Then observe the wave form

6. Calculate the frequency using formulae $f = 1/2\pi RC$

RESULT:

Frequency of oscillation of wien bridge oscillator is calculated