EXPERIMENT- 4

Objective: To study the Wien bridge oscillator.

Resources Required: Trainer kit of wien bridge oscillator.

Thoery :

A Wien-Bridge Oscillator is a type of phase-shift oscillator which is based upon a Wien-Bridge network (Figure 1a) comprising of four arms connected in a bridge fashion. Here two arms are purely resistive while the other two arms are a combination of resistors and capacitors. In particular, one arm has resistor and capacitor connected in series (R_1 and C_1) while the other hasthem in parallel (R_2 and C_2). This indicates that these two arms of the network behave identical to that of high pass filter or low pass filter.In this circuit, at high frequencies, the reactance of the capacitors C_1 and C_2 will be much less due to which the voltage V_0 will become zero as R_2 will be shorted. Next, at low frequencies, the reactance of the capacitors C_1 and C_2 will become very high.However even in this case, the output voltage V_0 will remain at zero only, as the capacitor C_1 would be acting as an open circuit. This kind of behavior exhibited by the Wien-Bridge network makes it a lead-lag circuit in the case of low and high frequencies

Circuit Diagram :

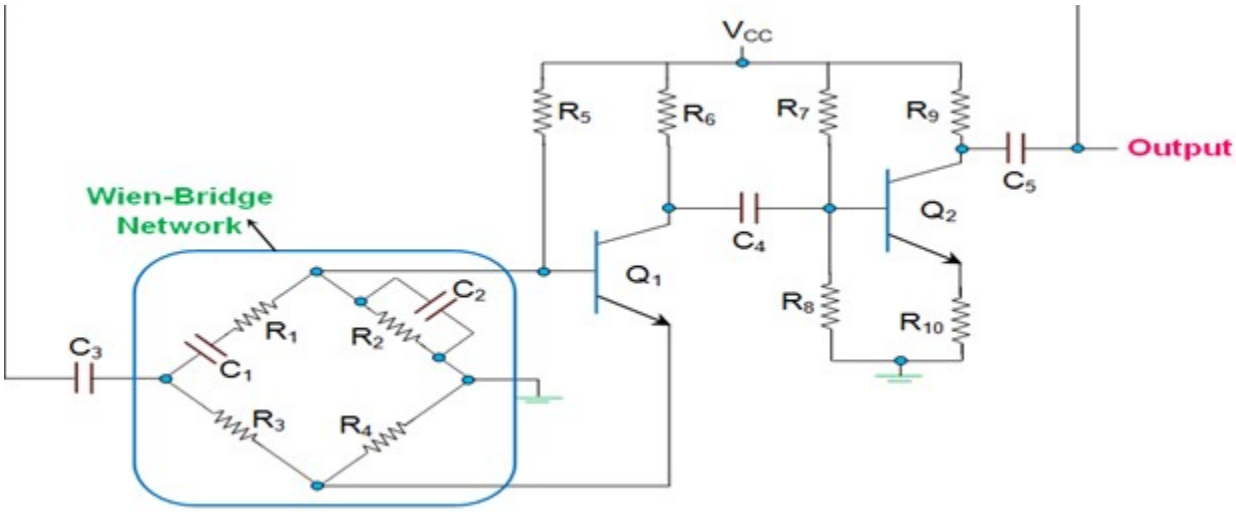

Fig: Wien bridge oscillator

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 generator.
5. Then observe the wave form.
6. Calculate the frequency using formulae

$$f = \frac{1}{2\pi\sqrt{R_1 R_2 C_1 C_2}}$$

RESULT:

Frequency of oscillation of wien bridge oscillator is calculated