

**Marwari college Darbhanga**

**Subject---physics ( Hons)**

**Class--- B. Sc. Part 2**

**Paper—04 ; Group—A**

**Topic--- Wein Bridge ( Electricity)**

**Lecture series –**

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## **Wien Bridge**

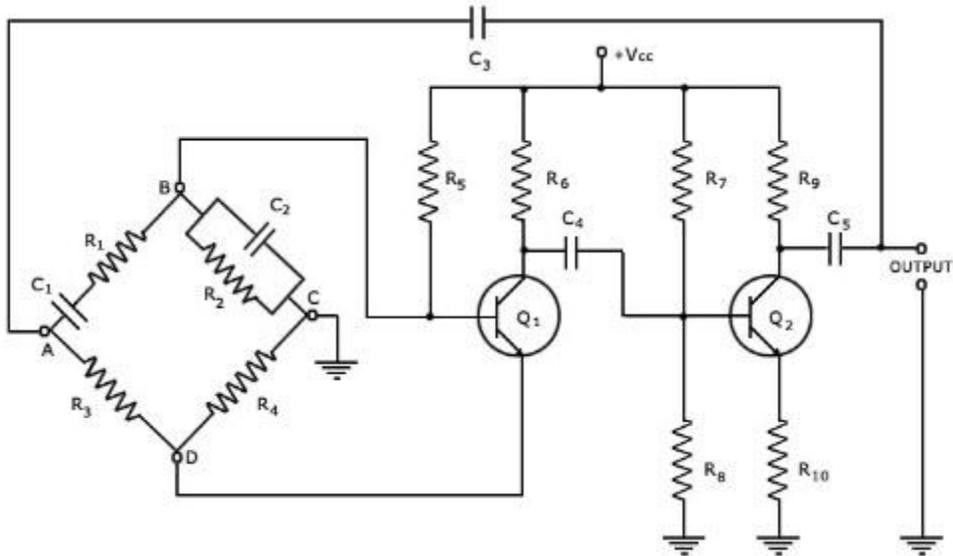
The Wien bridge oscillator is developed by Maxwien in the year 1981. The Wien bridge oscillator is based on the bridge circuit it consists of four resistors and two capacitors and it is used for the measurement of impedance. The huge amount of frequency is produced by the Wein bridge oscillator. The feedback circuit is used by the Wien bridge oscillator and the circuit consists of a series RC circuit which is connected to the parallel RC circuit. The components of the circuit have same values which give the phase delay and phase advance circuit with the help of frequency.

The Wien bridge oscillator is an electronic oscillator and produces the sine waves. It is a two stage RC circuit amplifier circuit and it has high quality of resonant frequency, low distortion, and also in the tuning. Consider the very simple sine wave oscillator used by the RC circuit and place in the conventional LC circuit, construct the output of sinusoidal waveform is called as an Wien bridge oscillator. The Wien bridge oscillator is also called as a Wheatstone bridge circuit.

### **Wein Bridge Oscillator Circuit**

The Wien bridge oscillator is used to find unknown values of components. In most of the cases this oscillator is used in the audios. The oscillators are designed simply, size is compressed and it has stable in frequency output. Hence the maximum output frequency of the Wien bridge oscillator is 1MHz and this frequency is from the phase shift oscillator. The total phase shift of the oscillator is from the  $360^\circ$  or  $0^\circ$ .

It is a two stage amplifier with RC bridge circuit and the circuit has the lead lag networks. The lags at the phase shift are increasing the frequency and the leads are decreasing the frequency. In addition by adding the Wien Bridge oscillator at a particular frequency it becomes sensitive. At this frequency the Wien Bridge is balance the phase shift of  $0^\circ$ . The following diagram shows the circuit diagram of the Wienbridge oscillator. The diagram shows R1 is series with the C1, R3, R4 and R2 are parallel with the C2 to form the four arms.



From the above diagram we can see the two transistors are used for the phase shift of  $360^\circ$  and also for the positive feedback. The negative feedback is connected to the circuit of the output with a range of frequencies. This has been taken through the R4 resistor to form the temperature sensitive lamp and the resistor is directly proportional to the increasing current. If the output of the amplitude is increased then the more current is offered more negative feedback.

### Applications of Wien Bridge Oscillators

- It is used to measure the audio frequency.
- Wien bridge oscillator designs the long range of frequencies
- It produces sine wave.

### Advantages

- Distortion testing of power amplifier.
- It supplies the signals for testing filters.
- Excitation for AC Bridge.
- To fabricate pure tone.

- Long distance can be spanned by the resting beams.

### Disadvantages

- The Wheatstone bridge is not used for the high resistance.
- The circuit needs the high no. of other components.
- The limited output frequency is obtained because the amplitude and the phase shift characters of the amplifier.