6/30/2022

EXPERIMENT NO.11

EC111

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GROUP NO.18

Name - Vishal Kumar Prajapati
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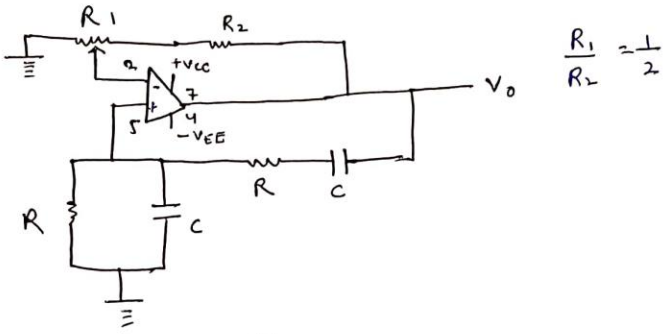
Experiment No. 11

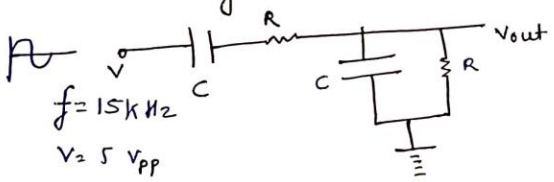
Aim: To study of wein bridge oscillatoscope.

Circuit diagram:



$\frac{R_1}{R_2} = \frac{1}{2}$

Load Lag Network.



$f = 12.66KHz$

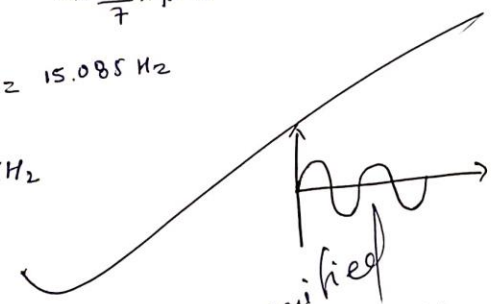
$f = 15KHz$
$V_2 = 5\ V_{pp}$
$R = 1 \cdot K\Omega$
$C = 1\ nF$

calculations:

$f_0 = \frac{1}{2\pi RC} = \frac{1}{2 \times \frac{22}{7} \times 1.06 \times 10^3 \times 10^{-9}}$ {R = 1.06KΩ}

$= 15.085\ Hz$

$f = 12.66KHz$



Verified
30/06/2022

EXPERIMENT NO. 11

TITLE: STUDY OF WIEN BRIDGE OSCILLATOR CIRCUIT.

OBJECTIVE:

- To design a Wein bridge oscillator circuit with amplitude stabilization so that the frequency of oscillation (fO) is 1.5 kHz and to study characteristics of a lead-lag network and plot amplitude vs frequency (amplitude response) & phase vs frequency (phase response) curve.

APPARATUS REQUIRED:

- Breadboard
- Connecting wires
- Resister 1kohm and capacitor 1 nF
- Power supply
- OP-amp (IC-741)
- Function generator
- oscilloscope

THOREY:

It is the commonly used audio frequency oscillator that employs both positive and negative feedback. The feedback signal is connected to the non-inverting input terminal so that the amplifier is working in non-inverting mode. The Wien bridge circuit is connected between the amplifier input terminal and output terminal. The bridge has a series RC network in one arm and a parallel RC network in the adjoining arm. In the remaining two arms of the bridge, resistors R1 and Rf are connected. The phase angle criterion for oscillation is that the total phase shift around the circuit must be zero. This condition occurs when the bridge is balanced. At resonance, the frequency of oscillation is exactly the resonance frequency of the balanced Wien bridge and is given by

$F_0 = 1/ (2\pi RC)$

At this frequency, the gain required for sustained oscillation is 3. It is provided by the non-inverting amplifier with Gain = 1+ (Rf/R1) = 3

CIRCUIT DIAGRAM:

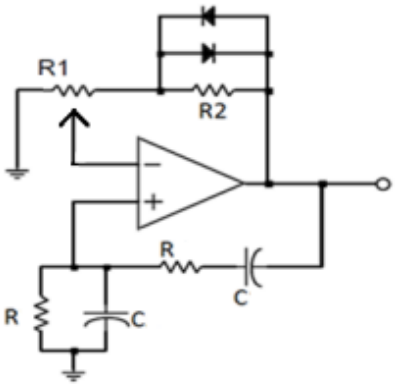


Fig 9.1: Circuit diagram of Wien bridge oscillator

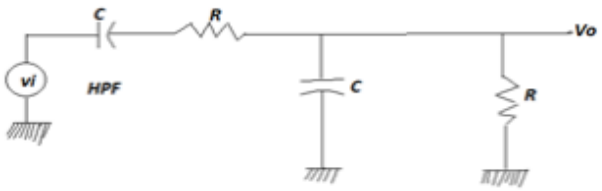


Fig 9.2: Lead lag network used in Wien bridge oscillator

OBSERVATION:

Lead-lag:

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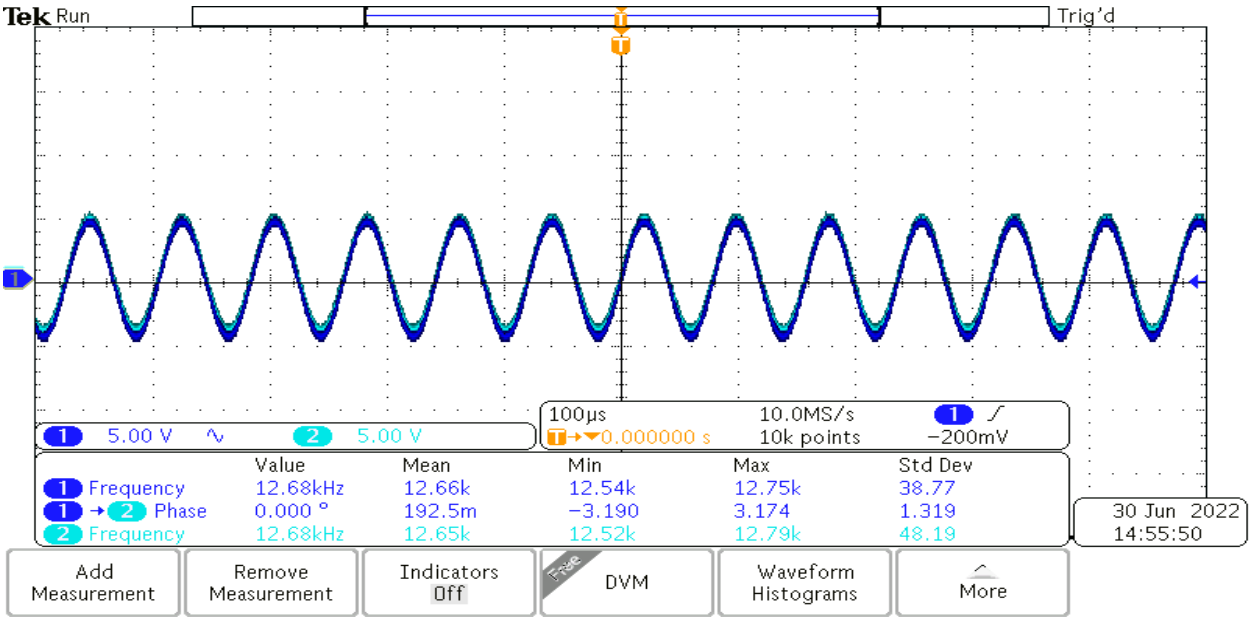
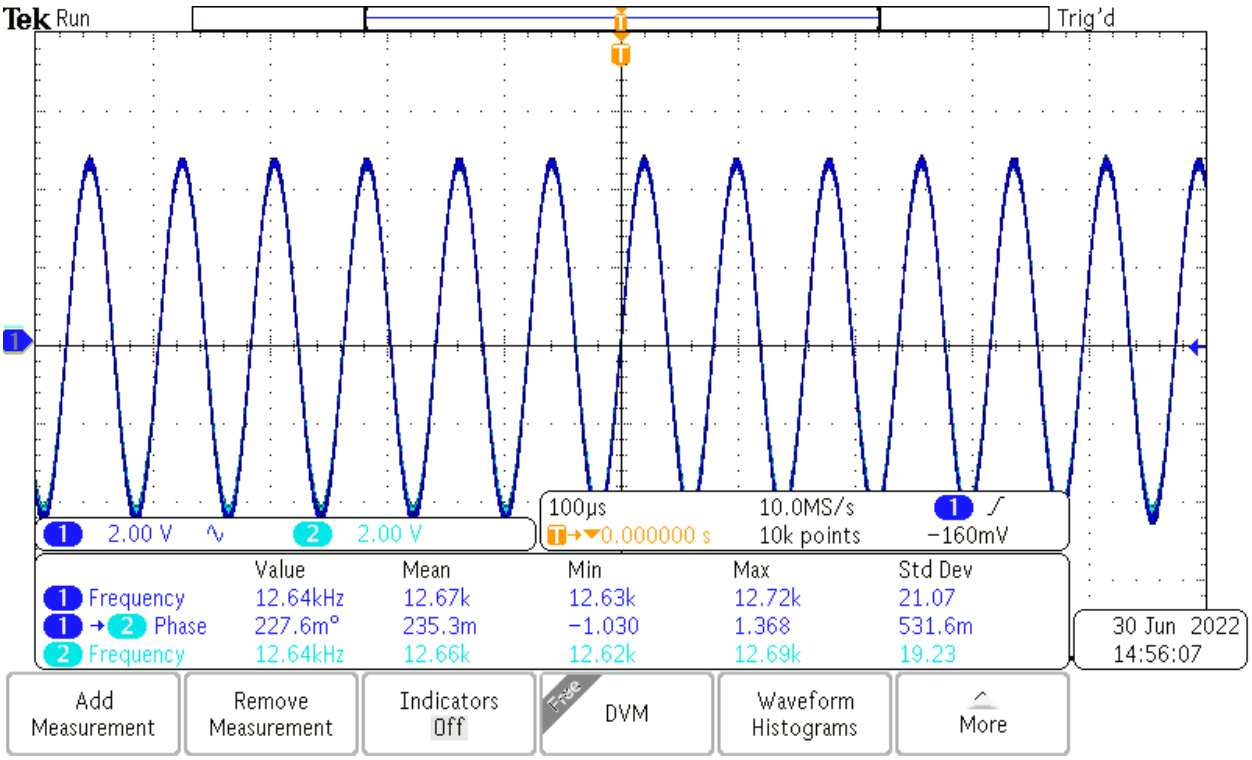
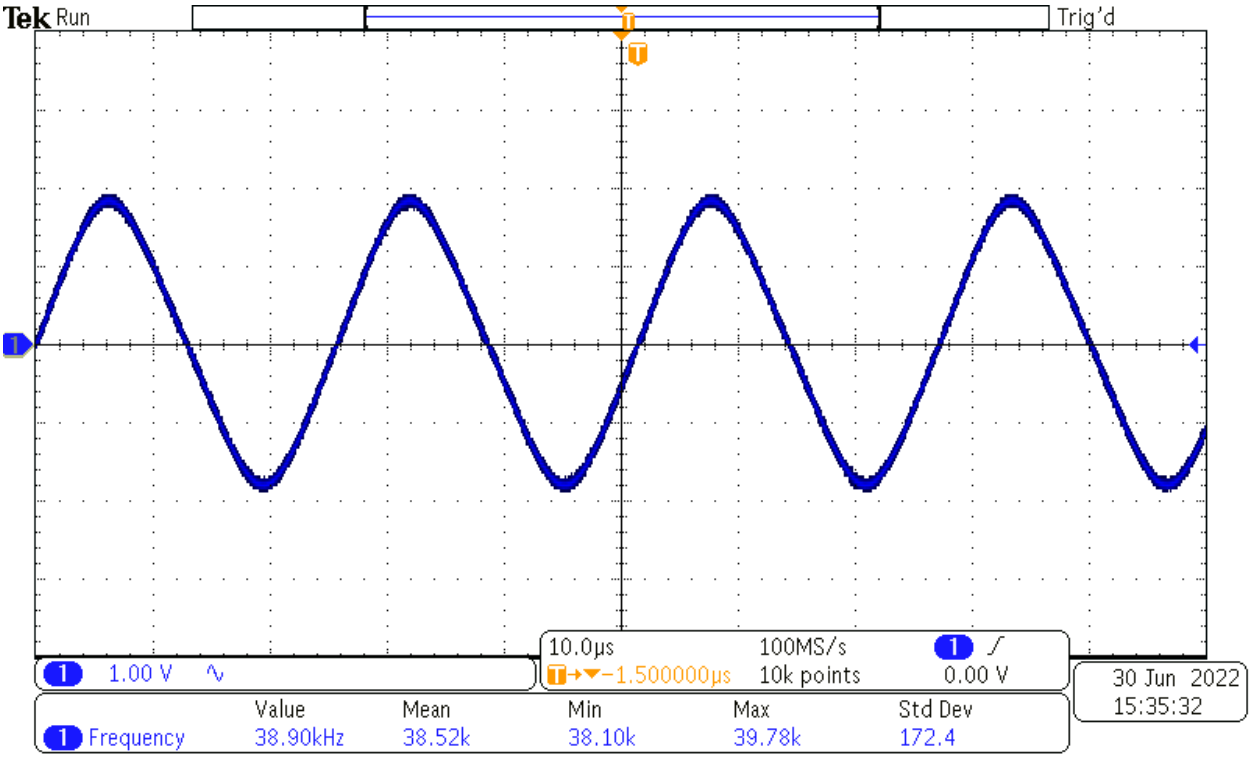




Oscillator:



RESULT:

- Successfully constructed lead-lag for wein bridge oscillator.
- Successfully analyzed wein bridge oscillator using an operational amplifier.

PRECAUTIONS:

- While experimenting does not exceed the ratings of IC. This may lead to damage to the IC.
- Connections should be made accordingly to the circuit diagram only.
- Do not be on the DC power supply for a long time otherwise diode may be burned.

- Wires should be tight and no short-circuiting should be there.
- Do not cross the maximum power rating.