Experiment no.9

§ Non-inverting amplifier §

9.1 Objective:

To design and study the open loop gain from Non-Inverting Amplifier circuit.

9.2 Theory:

The op amp non-inverting amplifier circuit provides a high input impedance with all the other advantages associated with operational amplifiers. The basic circuit for the non-inverting operational amplifier is relatively straightforward.

In this circuit, the signal is applied to the non-inverting input of the op-amp. In this way, the signal at the output is not inverted when compared to the input. However, the feedback is taken from the output of the op-amp via a resistor to the inverting input of the operational amplifier where another resistor is taken to ground. It has to be applied to the inverting input, as it is negative feedback.

It is the value of these two resistors that govern the gain of the operational amplifier circuit as they determine the level of feedback.

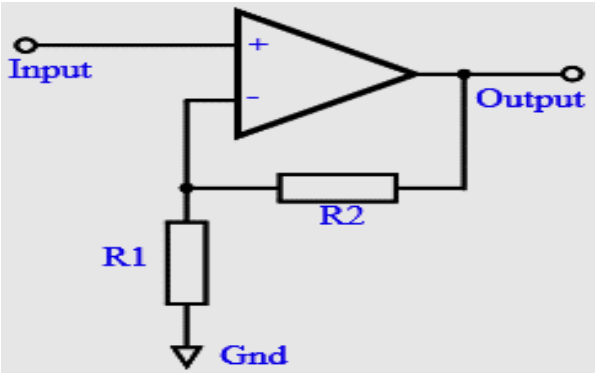

Figure (1)

The gain of the non-inverting circuit for the operational amplifier:

$$A_v = 1 + \frac{R2}{R1}$$

In eq. above:
Av = voltage gain of op amp circuit.
R2 = feedback resistor resistance in Ω (Rf)
R1 = resistance of resistor to ground in Ω (Rg)

9.3 Procedure:

1. Enter specific (input voltage) (2V) from the power supply device and draw input waveform (Sin wave) by using Oscilloscope.

2. Connect the circuit shown in the figure (2).

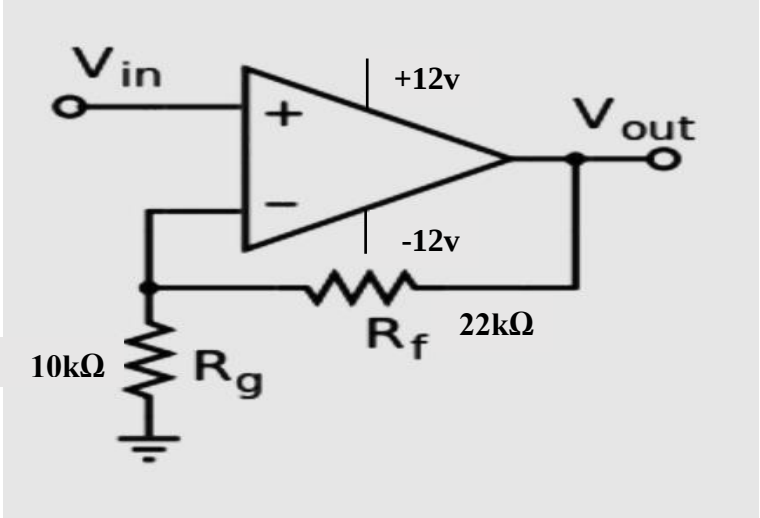

Figure (2)

3. Connect the first terminal of **OSC** to the output terminal of op-amp and second terminal of **OSC** to the ground.

4. Turn on the circuit and Draw output waveform (sin wave) by using Oscilloscope. (Must be 4v not opposite of in/p waveform)

9.4 Discussion:

1. Deduct the value of the gain **G** and compare it with theoretical value?
2. What is the non-inverting operational amplifier?
3. Calculate the average voltage (Av) of inverter Op-amp?