| **Course Name:** | **Elements of Electrical and Electronics Engineering** | **Semester:** | **I/II** |
| --- | --- | --- | --- |
| **Date of Performance:** |  | **Batch No:** | **A3** |
| **Faculty Name:** | **Maruti Zalte** | **Roll No:** | **16010121051** |
| **Faculty Sign & Date:** |  | **Grade/Marks:** | **/ 25** |

**Experiment No: 10**

**Title:** **Inverting and Non-inverting amplifier using OPAMP**

| **Aim and Objective of the Experiment:** |
| --- |
| * To understand the open loop configuration of OPAMP * To understand the concept of negative feedback and closed loop configuration of OPAMP. * To understand inverting and Non-inverting amplifier of OPAMP * To find gain of inverting and non-inverting amplifiers |

| **COs to be achieved:** |
| --- |
| **CO5:** Understand operational amplifier and its applications |

| **Circuit Diagram/ Block Diagram:** |
| --- |
| **Pin diagram of IC 741**    Pin Configuration of 741 Op-amp Diagram    **1. Inverting Amplifier**    **2. Non-inverting Amplifier**    **Observation Table:**  **1. A. Inverting Amplifier: DC input Voltage**   | **Sr.No.** | **Vin (V)** | **Vout (V)** | **Practical**  **Gain = Vout/Vin** | **Theoretical**  **Gain=-RF/R1** | | --- | --- | --- | --- | --- | | **1.** | **1** | **-9.99** | **-9.99** | **-10** | | **2.** | **1.2** | **-12.0** | **-10** | **-10** | | **3.** | **0.8** | **-7.99** | **-9.98** | **-10** |   **1. B. Inverting Amplifier: AC input Voltage**   | **Sr.No.** | **Frequency (Hz)** | **Vin(p-p) (V)** | **Vout(p-p) (V)** | **Practical**  **Gain = Vout/Vin** | **Theoretical**  **Gain=-RF/R1** | | --- | --- | --- | --- | --- | --- | | **1.** | **1K** | **1** | **10** | **-10** | **-10** | | **2.** | **2K** | **2** | **20** | **-10** | **-10** | | **3.** | **1K** | **0.8** | **8** | **-10** | **-10** |   **2. A. Non-inverting Amplifier: DC input Voltage**   | **Sr.No.** | **Vin (V)** | **Vout (V)** | **Practical**  **Gain = Vout/Vin** | **Theoretical**  **Gain=1+RF/R1** | | --- | --- | --- | --- | --- | | **1.** | **1** | **11** | **11** | **11** | | **2.** | **1.2** | **13.2** | **11** | **11** | | **3.** | **0.8** | **8.81** | **11** | **11** |   **2. B. Non-inverting Amplifier: AC input Voltage**   | **Sr.No.** | **Frequency (Hz)** | **Vin(p-p) (V)** | **Vout(p-p) (V)** | **Practical**  **Gain = Vout/Vin** | **Theoretical**  **Gain=1+RF/R1** | | --- | --- | --- | --- | --- | --- | | **1.** | **1K** | **1V** | **11** | **11** | **11** | | **2.** | **2K** | **2V** | **22** | **11** | **11** | | 3. | **1K** | **0.8** | **9** | **11.25** | **11** |           **Post Lab Subjective/Objective type Questions:**  **1. List the characteristics of Ideal operational amplifier.**  i. Infinite Open loop gain.  ii. Infinite Input Impedance.  iii. Zero Output Impedance.  iv. Infinite Bandwidth.  v. Zero Offset Voltage.  vi. Zero Input Bias current.  **2. List the important parameters of IC 741 operational amplifier.**  i. The open loop gain = 2 x 10^5  ii. Input impedance = 2 mOhm  iii. Output impedance is from 75- 100 Ohms  iv. Finite Bandwidth around 1 MHz  v. The offset voltage is in the range of 2 – 6 mVolts  vi. Input bias current is in the range of 500 nano Amps |

| **Conclusion:** |
| --- |
| You can use Op Amp in inverting and non-inverting cases. |

| **Signature of faculty in-charge with Date:** |
| --- |