BASIC ELECTRONICS LAB REPORT

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COURSE TITLE: BASIC ELECTRONICS LAB

COURSE CODE: CSEL-1206

Experiment No: 01

Experiment Name: To verify Zener diode as a voltage regulator with fixed input voltage V_{in} and variable load resistance R_L.

Objective: To study Zener diode as a voltage regulator, when input voltage V_{in} is fixed while load resistance R_L is variable.

Components:

1. DC power supply +15V external source
2. Digital Multimeter (DMM)
3. Resistor (2 pcs)
4. Breadboard
5. Wires

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Circuit Diagram: Circuit used to study Zener diode as a voltage regulator is shown in the following figure:

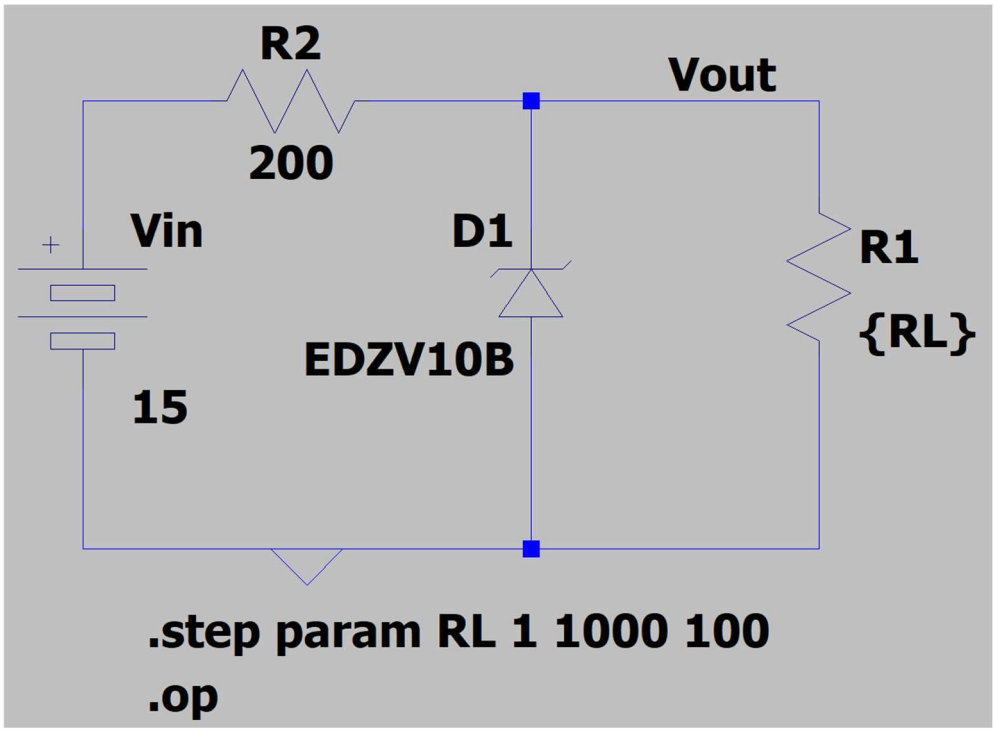
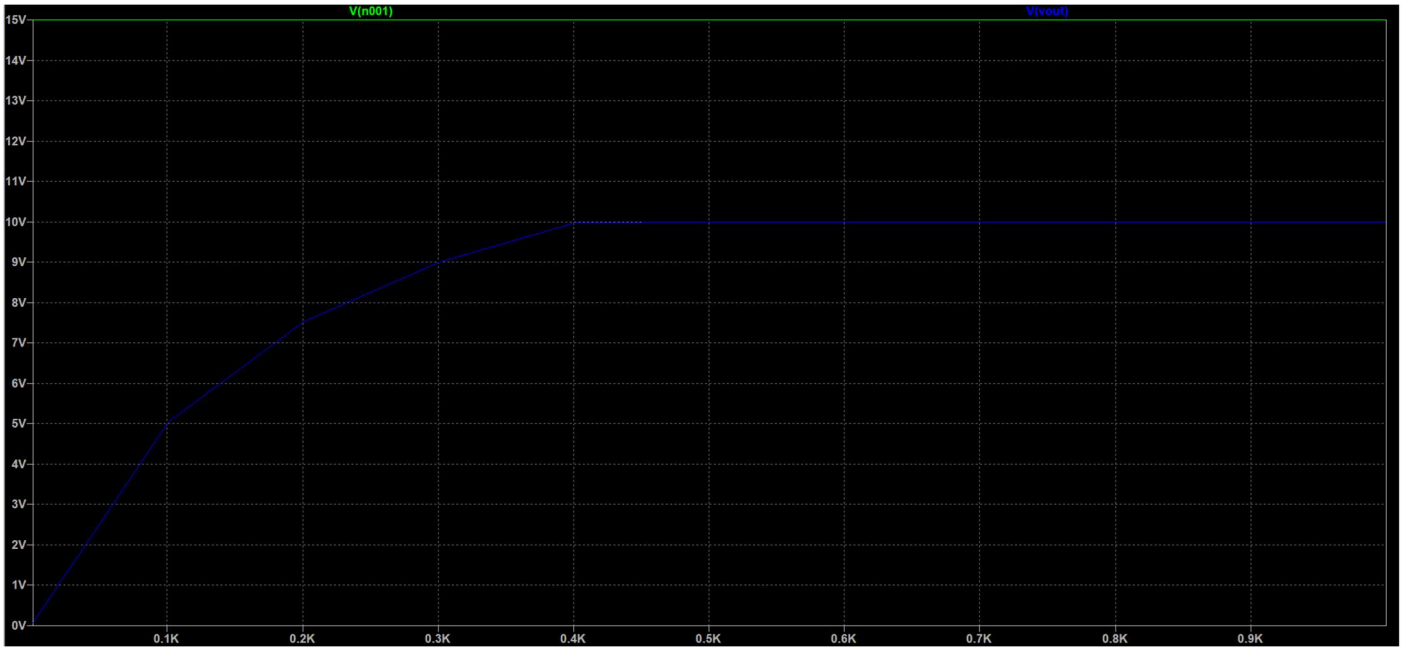


Figure 1.1: A Zener Diode Voltage Regulator

Graph:



**Green line indicates input*
**Blue line indicates output*

Graph 1.1: Input and Output waveform of Zener Diode Voltage

Experiment No: 02

Experiment Name: To verify Zener diode as a voltage regulator with fixed load resistance R_L and variable input voltage V_{in}.

Objective: To study Zener diode as a voltage regulator, when input voltage V_{in} is variable while Load resistance R_L is fixed.

Components:

1. DC power supply +(1 — 30)V external source
2. Digital Multimeter (DMM)
3. Resistor (2 pcs)
4. Breadboard
5. Wires

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Circuit Diagram: Circuit used to study Zener diode as a voltage regulator is shown in the following figure:

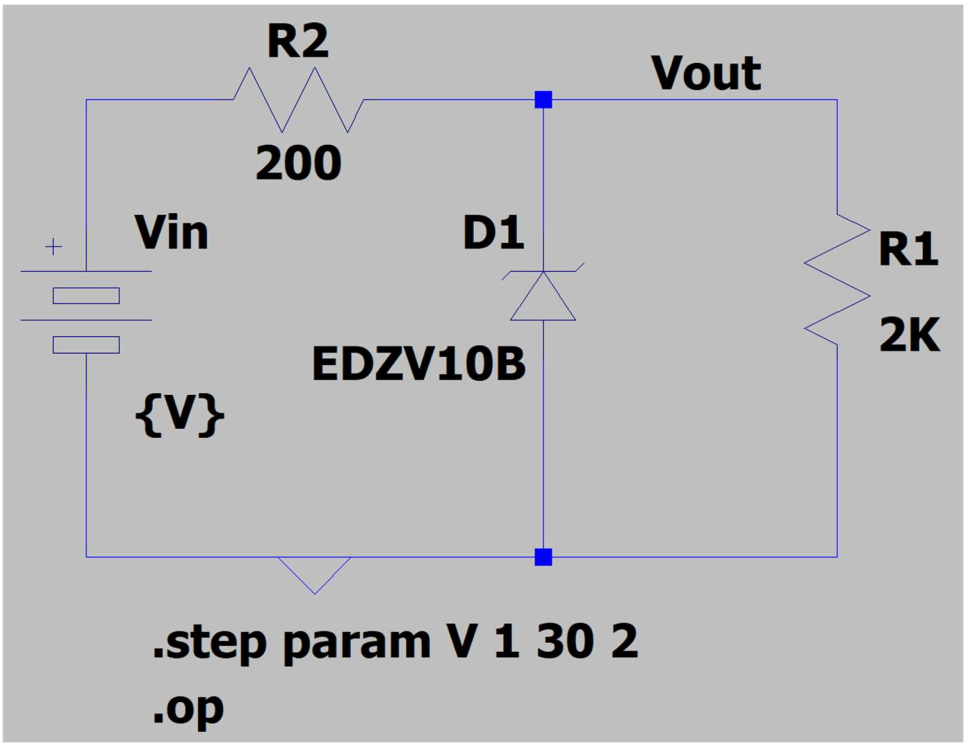

Figure 2.1: A Zener Diode Voltage Regulator

Graph:

**Green line indicates input*
**Blue line indicates output*

Graph 2.1: Input and Output waveform of Zener Diode Voltage

Experiment No: 03

Experiment Name: To verify and experiment Half-wave and Full-wave rectifier.

Objective: To study the characteristics and operation of Half-wave and Full-wave rectifier.

Components:

1. DC power supply
2. Digital Multimeter (DMM)
3. Resistor (2 pcs)
4. Transformer
5. Breadboard
6. Diode (5 pcs)
7. Wires

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Circuit Diagram (Half-wave rectifier): Circuit used to study Half-wave rectifier is shown in the following figure:

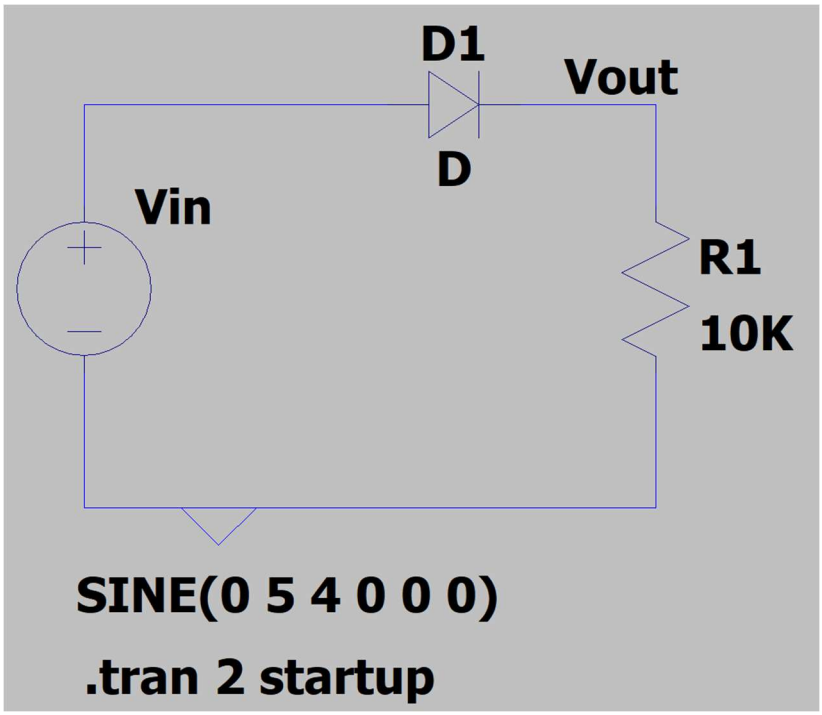
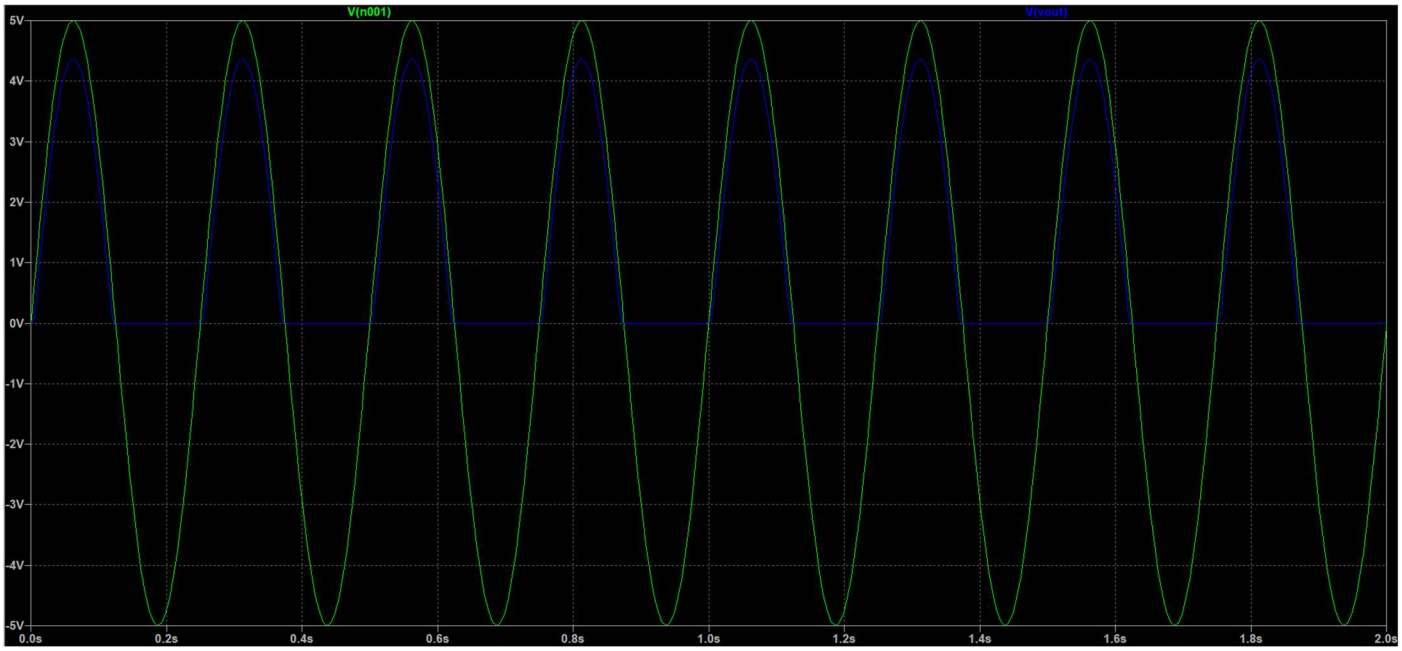


Figure 3.1: A Half-wave rectifier

Graph (Half-wave rectifier):



**Green line indicates input*
**Blue line indicates output*

Graph 3.1: Input and Output waveform of Half-wave rectifier

Circuit Diagram (Full-wave rectifier): Circuit used to study Full-wave rectifier is shown in the following figure:

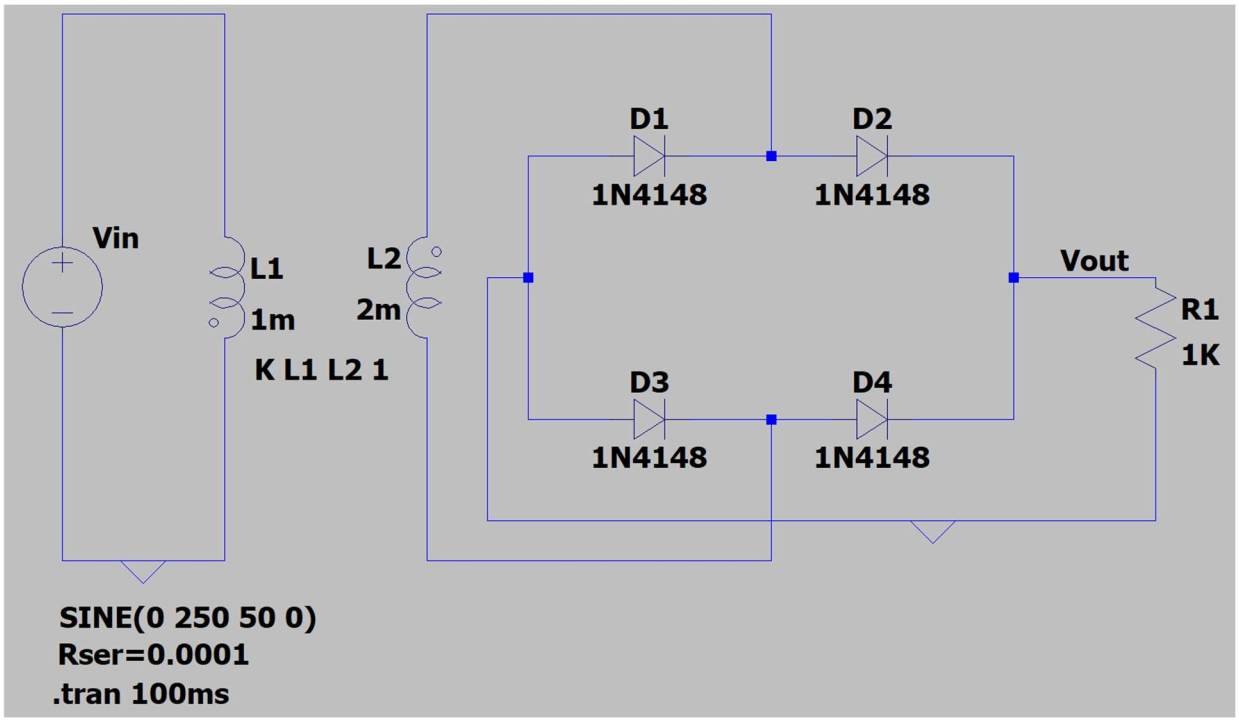
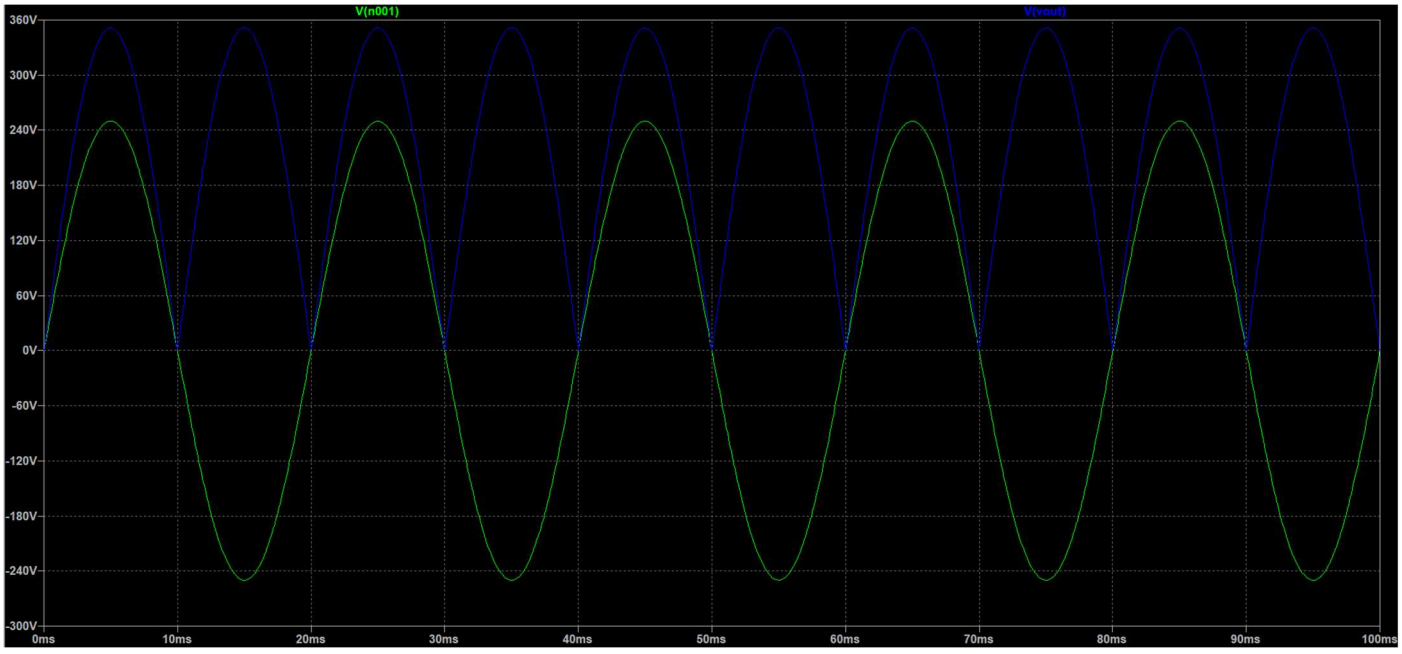


Figure 3.2: A Full-wave rectifier

Graph (Full-wave rectifier):



**Green line indicates input*
**Blue line indicates output*

Graph 3.2: Input and Output waveform of Full-wave rectifier

Experiment No: 07

Experiment Name: To design and verify Inverting and Non-inverting amplifier using 741 Op-amp.

Objective: To study the input & output waveform of Inverting and Non-inverting amplifier using 741 Op-amp.

Components:

1. DC power supply
2. Digital Multimeter (DMM)
3. Resistor (4 pcs)
4. IC — LM741 (2 pcs)
5. Breadboard
6. Wires

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Circuit Diagram (Inverting amplifier): Circuit used to study Inverting amplifier is shown in the following figure:

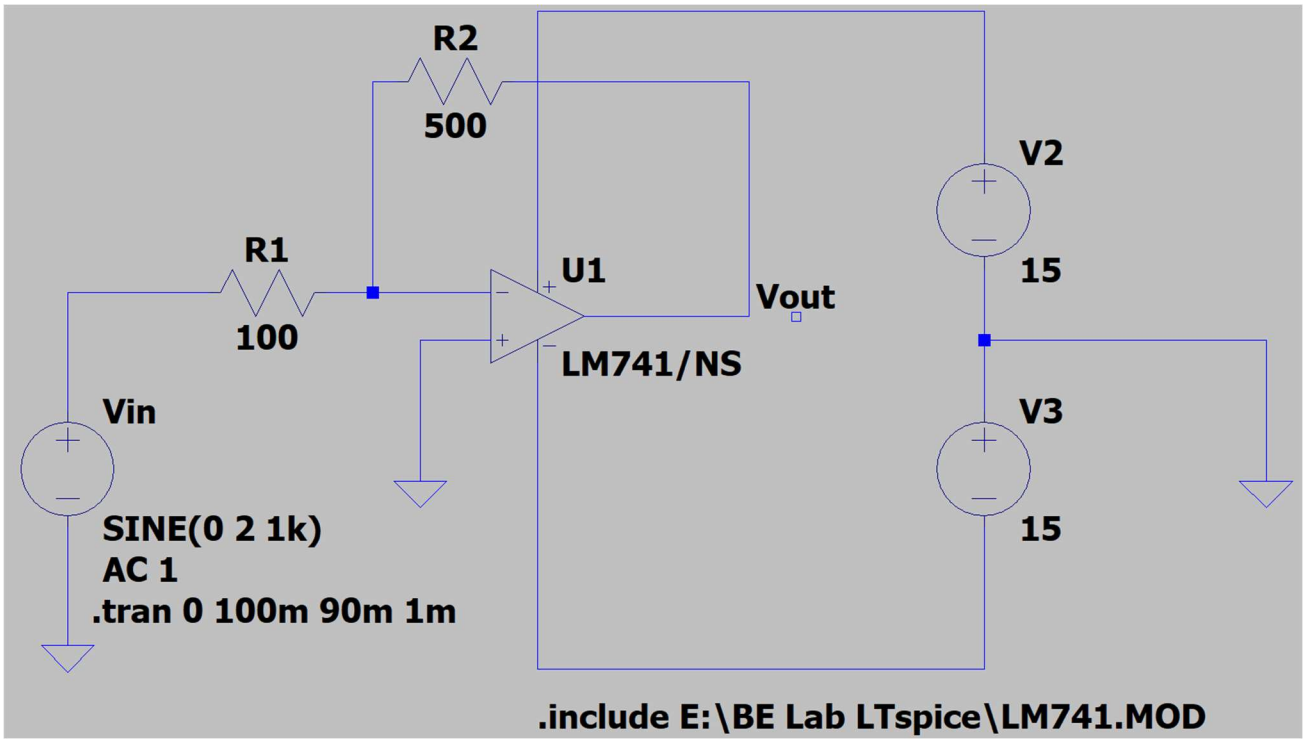
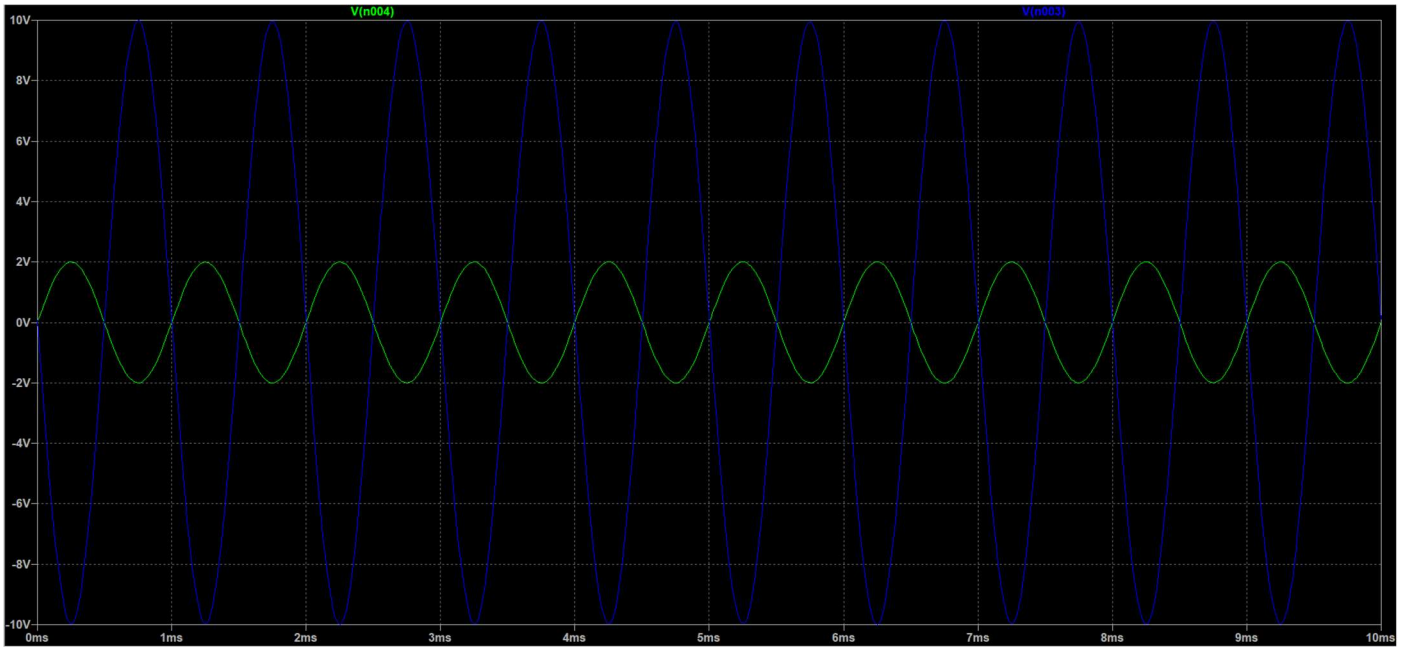


Figure 7.1: An Inverting amplifier using LM741

Graph (Inverting amplifier):



**Green line indicates input*
**Blue line indicates output*

Graph 7.1: Input and Output waveform of Inverting amplifier

Circuit Diagram (Non-inverting amplifier): Circuit used to study Non-inverting amplifier is shown in the following figure:

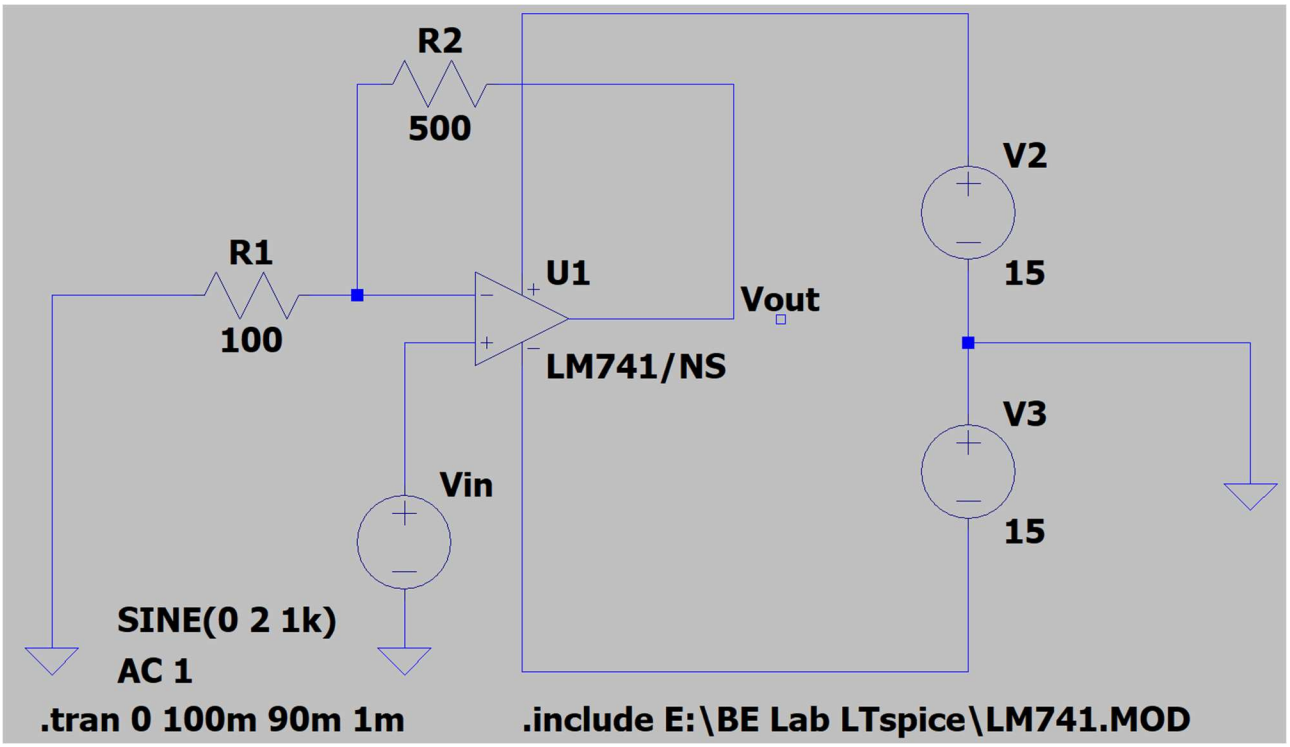
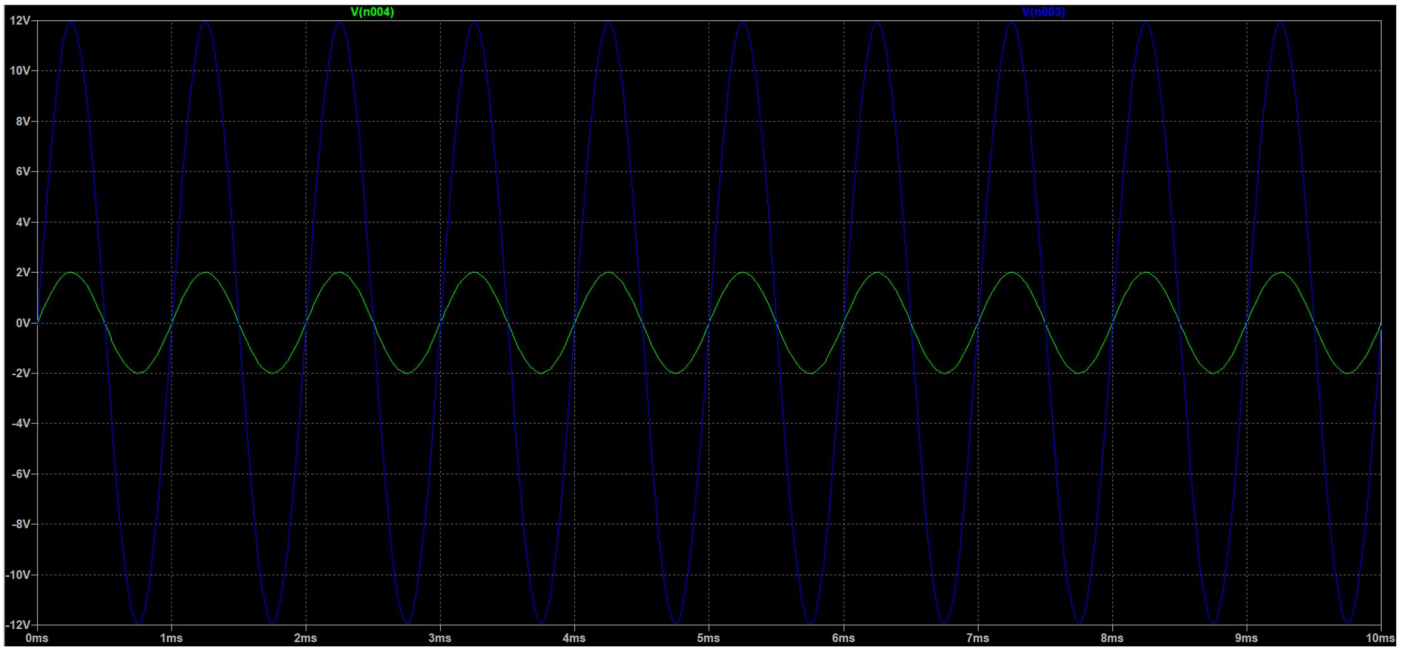


Figure 7.2: A Non-inverting amplifier using LM741

Graph (Non-inverting amplifier):



**Green line indicates input*
**Blue line indicates output*

Graph 7.2: Input and Output waveform of Non-inverting amplifier

Experiment No: 08

Experiment Name: To design and verify the operations of Summing and Subtractor amplifier circuit using 741 Op-amp.

Objective: To study the input & output waveform of Summing and Subtractor amplifier circuit using 741 Op-amp.

Components:

1. DC power supply
2. Digital Multimeter (DMM)
3. Resistor (9 pcs)
4. IC — 741 Op-amp (2 pcs)
5. Breadboard
6. Wires

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Circuit Diagram (Summing amplifier): Circuit used to study Summing amplifier is shown in the following figure:

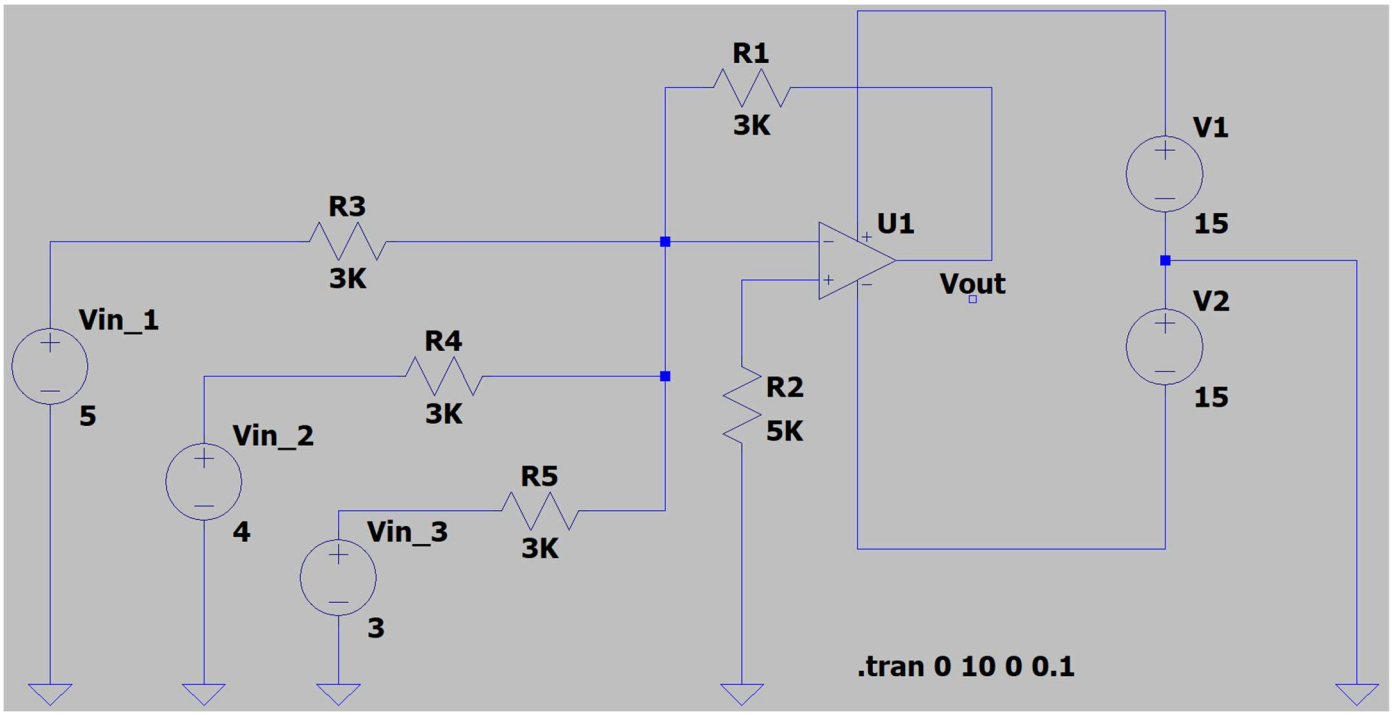
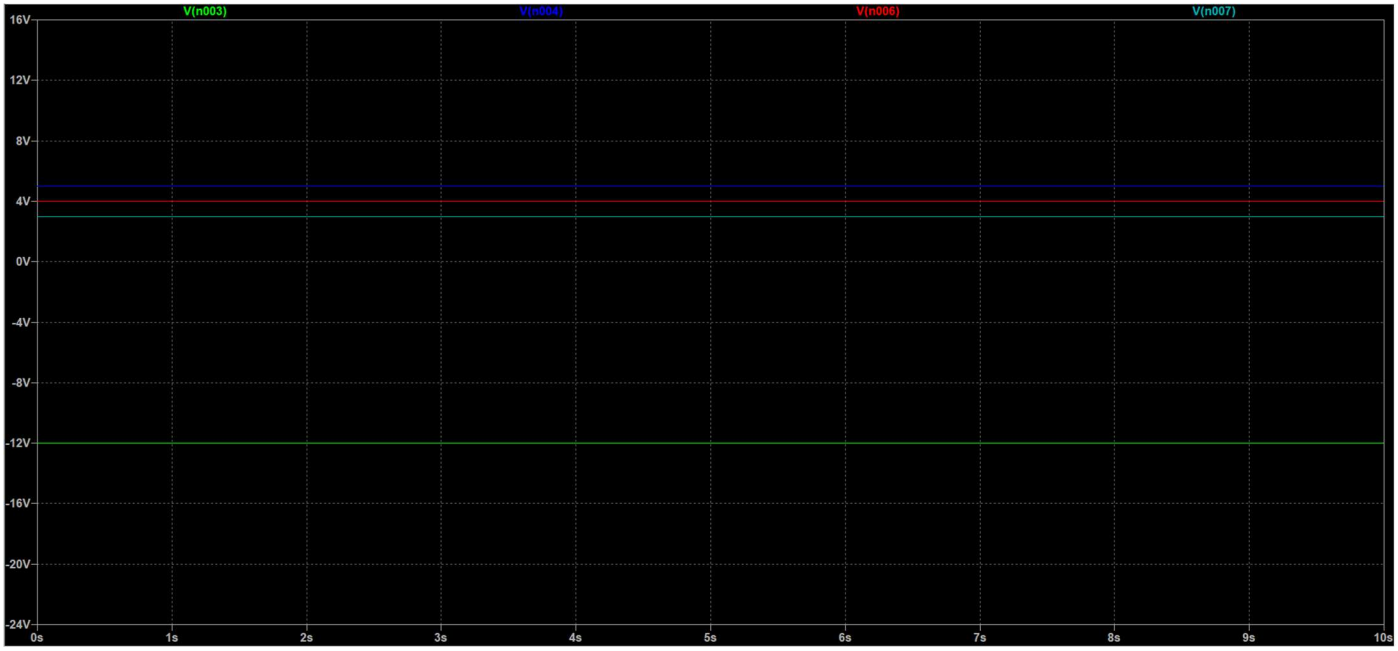


Figure 8.1: A Summing amplifier using 741 Op-amp

Graph (Summing amplifier):



**Blue, Red and Paste color lines indicate input*
**Green line indicates output*

Graph 8.1: Input and Output waveform of Summing amplifier

Circuit Diagram (Subtractor amplifier): Circuit used to study Subtractor amplifier is shown in the following figure:

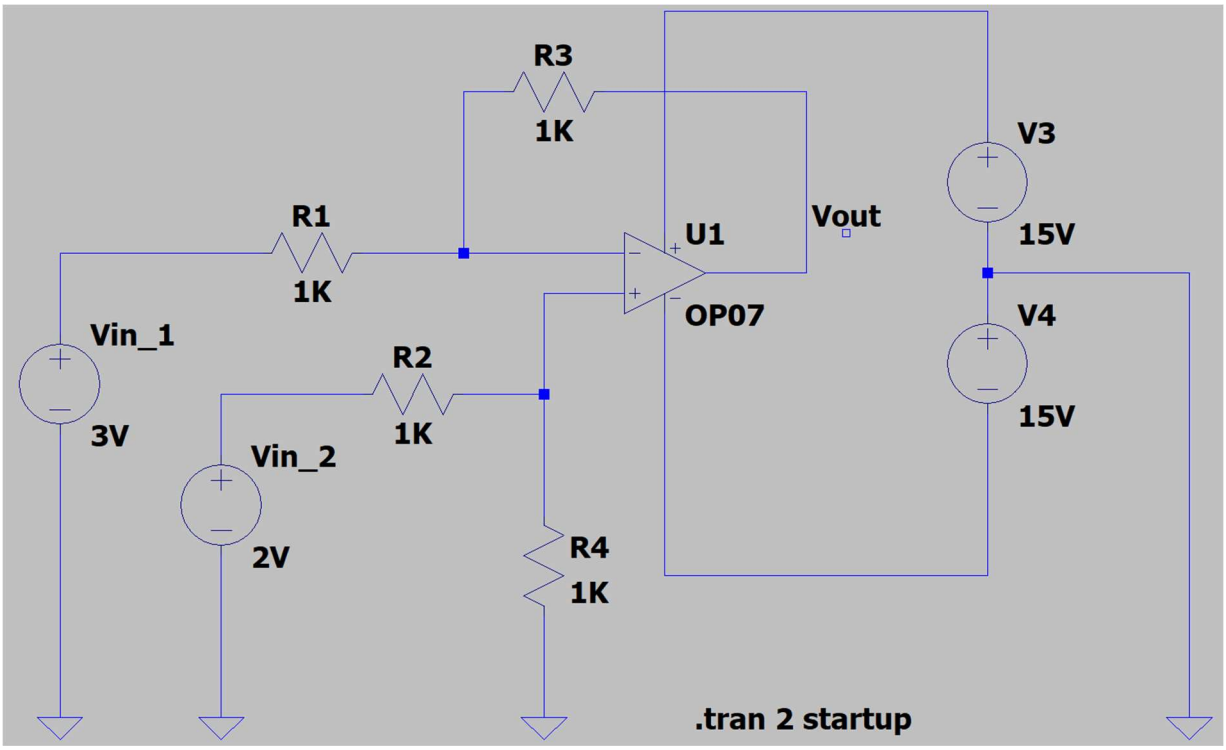
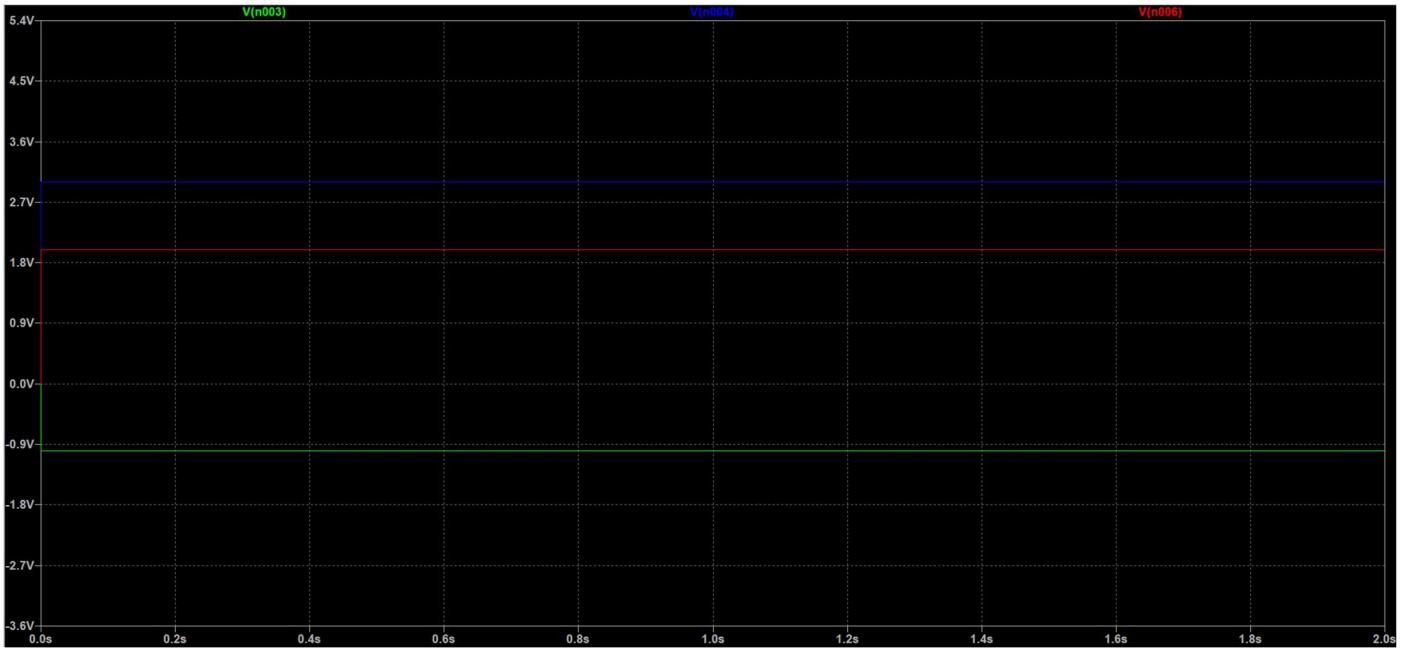


Figure 8.2: A Subtractor amplifier using 741 Op-amp

Graph (Subtractor amplifier):



**Blue and Red color lines indicate input*

**Green line indicates output*

Graph 8.2: Input and Output waveform of Subtractor amplifier

Experiment No: 09

Experiment Name: To design and verify the characteristics of 741 op-am Integrator circuit for different inputs.

Objective: To get familiarized with and to observe the characteristics of Integrator circuit for different inputs.

Components:

1. DC power supply
2. Digital Multimeter (DMM)
3. Resistor (3 pcs)
4. Capacitor
5. IC — 741 Op-amp
6. Breadboard
7. Wires

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Circuit Diagram: Circuit used to study Integrator circuit is shown in the following figure:

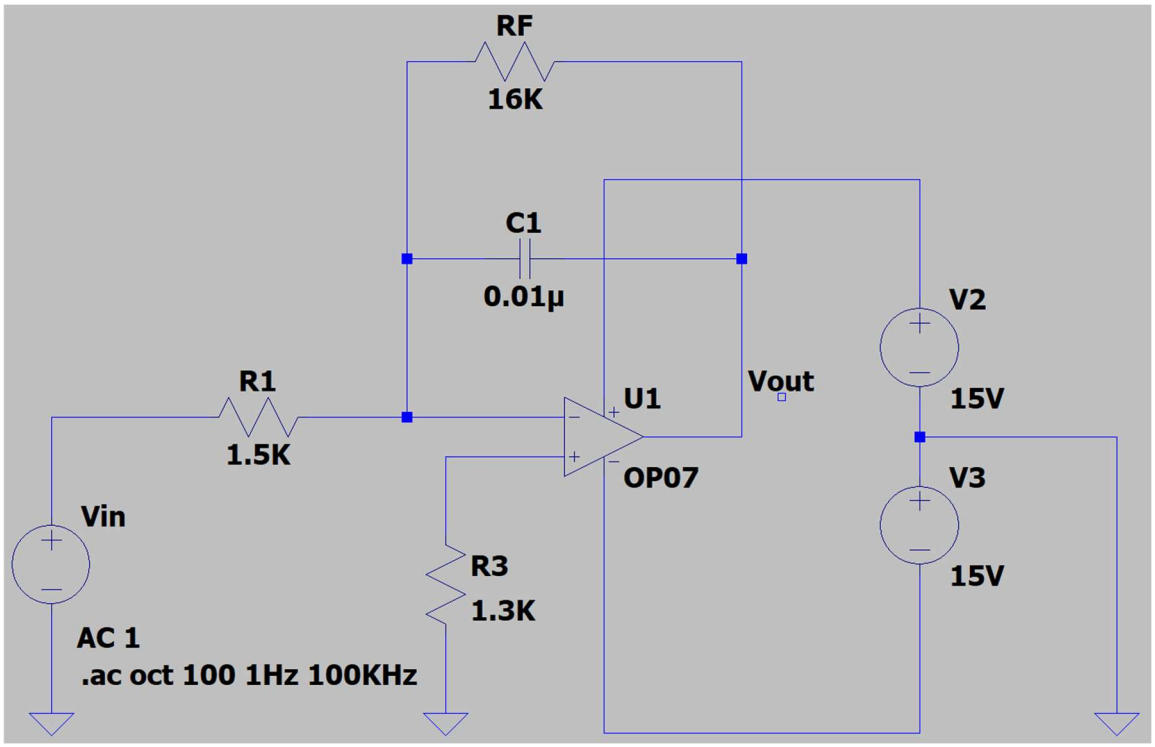
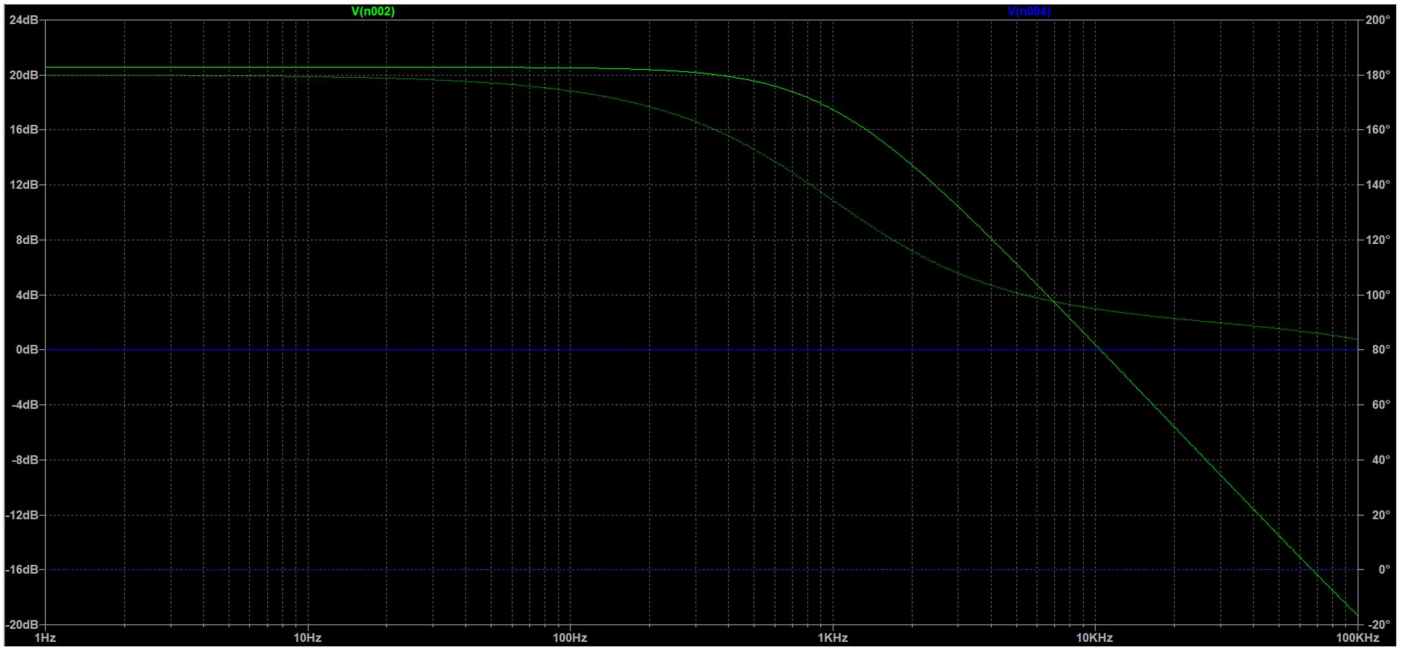


Figure 9.1: An Integrator circuit using 741 Op-amp

Graph:



**Blue lines indicate input*

**Green lines indicate output*

Graph 9.1: Input and Output waveform of Integrator circuit

Experiment No: 10

Experiment Name: To design and verify the characteristics of 741 op-am Differentiator circuit for different inputs.

Objective: To get familiarized with and to observe the characteristics of Differentiator circuit for different inputs.

Components:

1. DC power supply
2. Digital Multimeter (DMM)
3. Resistor (3 pcs)
4. Capacitor (2 pcs)
5. IC — 741 Op-amp
6. Breadboard
7. Wires

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Circuit Diagram: Circuit used to study Differentiator circuit is shown in the following figure:

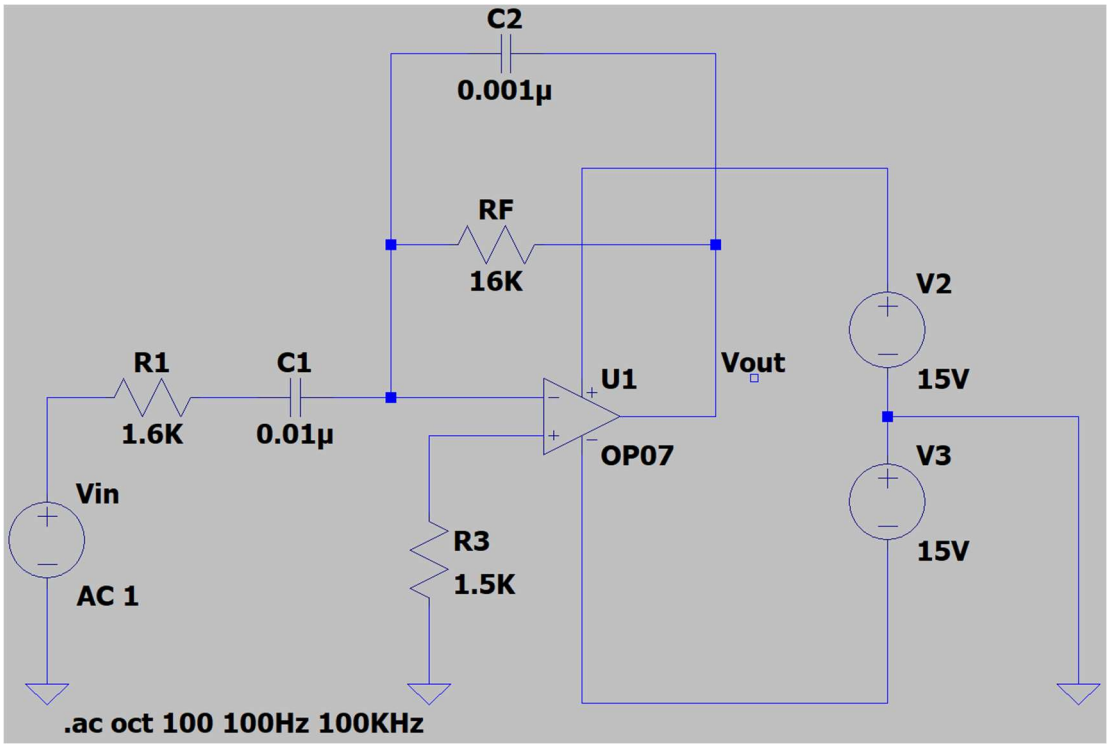
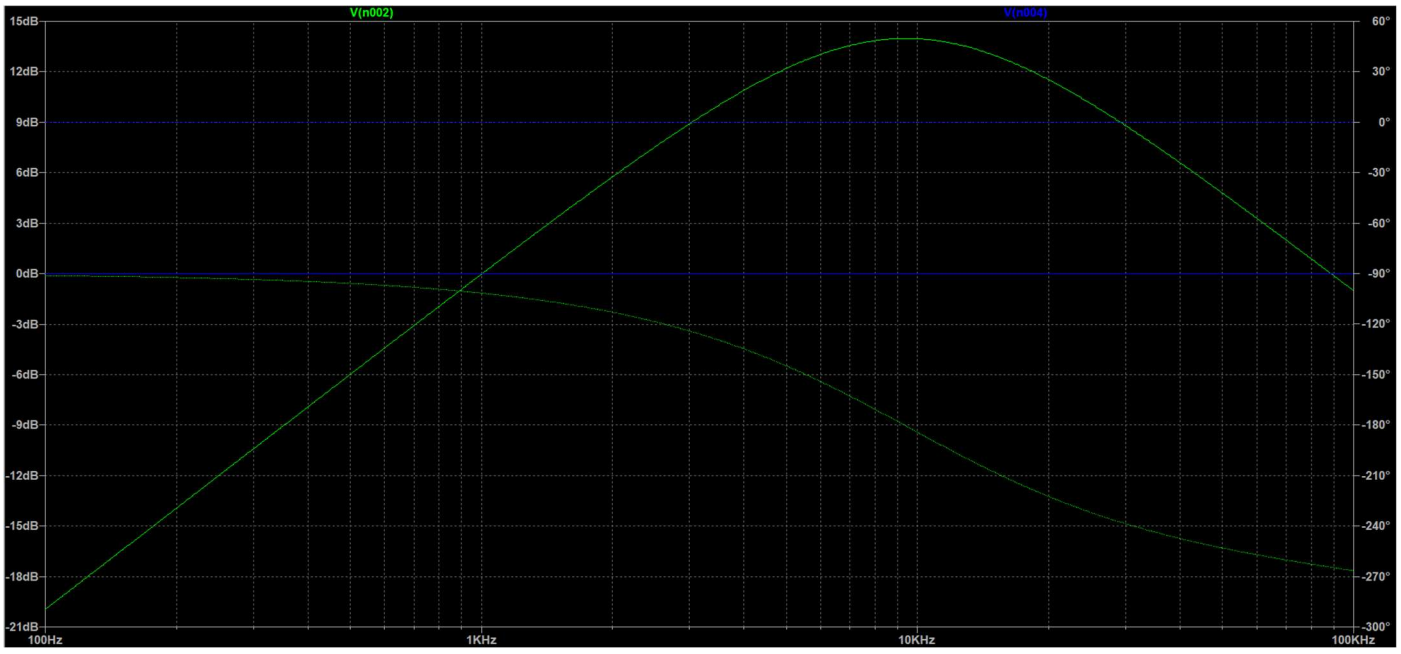


Figure 10.1: A Differentiator circuit using 741 Op-amp

Graph:



**Blue lines indicate input*

**Green lines indicate output*

Graph 10.1: Input and Output waveform of Differentiator circuit