GREEN UNIVERSITY OF BANGLADESH

Department of Computer Science & Engineering

Course Code: EEE-204

Course Title: Electronics lab

Experiment Number : 01
Experiment Name : Study of Diode I-V Characteristic

Date of Performance : 17.02.2021
Date of Submission : 05.04.2021

Submitted to:	Submitted by:
Name : Sakib Abdul Ahad	Name : Jakirul Islam
Designation : Lecture	ID : 193002101
Dept : EEE	Dept. : CSE

Remark

Experiment no: 01

Experiment name: study of Diode I-V characteristic.

objectives:

1. To study the diode I-V characteristics
2. To observe the output of a simple with a diode using AC input.

Instrument Required:

Serial	Name	Rating	Quantity
1	Project Board		1 Piece
2	Diode		4 piece
3	Resistor		1 piece
4	multimeter		1 unit
5	Signal generator		1 Piece
6	oscilloscope		1 unit
7	chords and wire		lot.

Circuit Diagram:

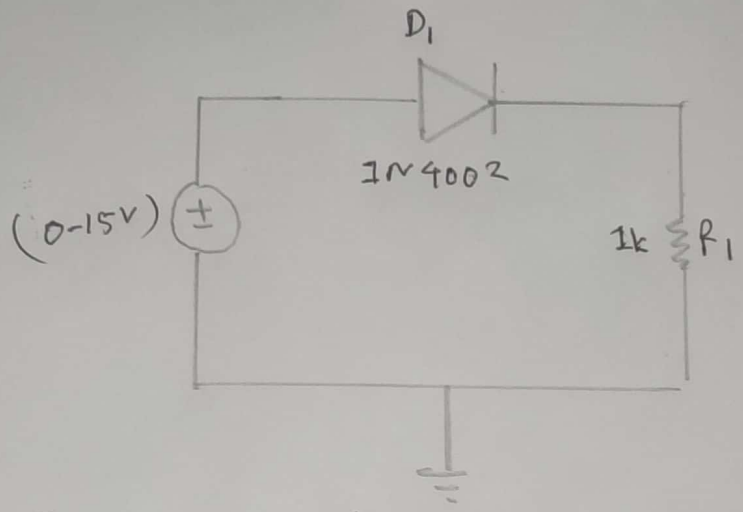

Fig: 1(a): PN forward bias circuit

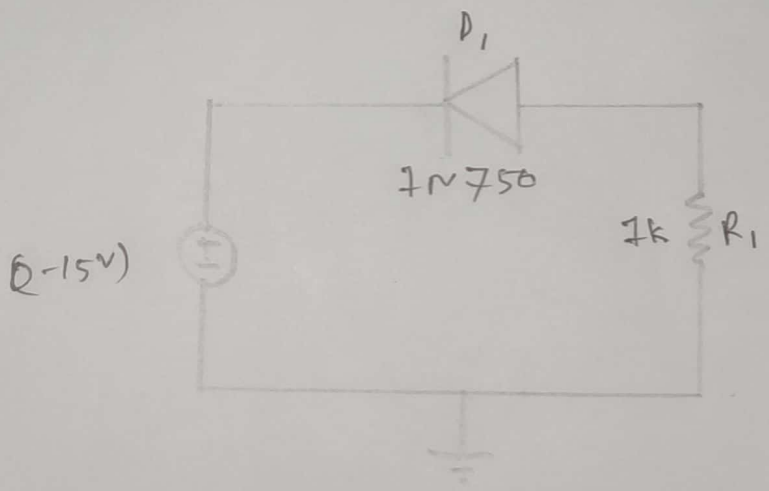

Fig: 1(b): PN reverse bias circuit.

Description:-

A p-n junction diode is a two-terminal device that acts as a one way conductor. that means its permits the passage of electrical current in only one way and prevents. if the current is passed from the other terminal. A diode can be connected in a circuit in two configurations.

1. forward Biased configuration
2. Reverse Biased configuration

forward Bias, when the voltage at the p-side of a p-n diode is higher than that of its n-side. then the diode is called forward Biased.

Reverse Bias, when a diode gets negative voltage across it then it is in Reverse Biased

Breakdown voltage, when the voltage caused the burn is called Breakdown voltage. there will be a rush of current of that time and that current is called Avalanch current

Experimental Data table :

Calculation:

Result:

Discussions:

The diode should not be short circuited. that will allow the flow of huge current which might destroy the diode.

If we just reverse the diode to measure the I-v characteristics. the sudden change might destroy the diode.

current must not pass through it for a very long time. If will then increase the depletion region and develop a fluctuating resistance.

GREEN UNIVERSITY OF BANGLADESH

Department of Computer Science & Engineering

Course Code: EEE-204

Course Title: Electronics lab

Experiment Number : 02
Experiment Name : Study of Diode Rectifier Circuits

Date of Performance : 23.02.2021
Date of Submission : 05.04.2021

Submitted to:	Submitted by:
Name : Sakib Abdul Ahad	Name : Jakirul Islam
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Dept : EEE	Dept. : CSE

Remark

Objectives:

1. To understand Principle of diode in converting Ac into ~~de~~ Dc.
2. To study different diode rectifiers circuits.

Instruments Required:

Serial	Name	Ratings	Quantity
1	Project Board		1 pieces
2	p-n junction Diode		4 pieces
3	Resistor		1 piece
4	Zener Diode		1 piece
5	Capacitor		1 piece
6	Multimeter		1 unit
7	Signal generator		1 piece
8	oscilloscope		1 unit
9	chords and wire		lot

Circuit Diagram:

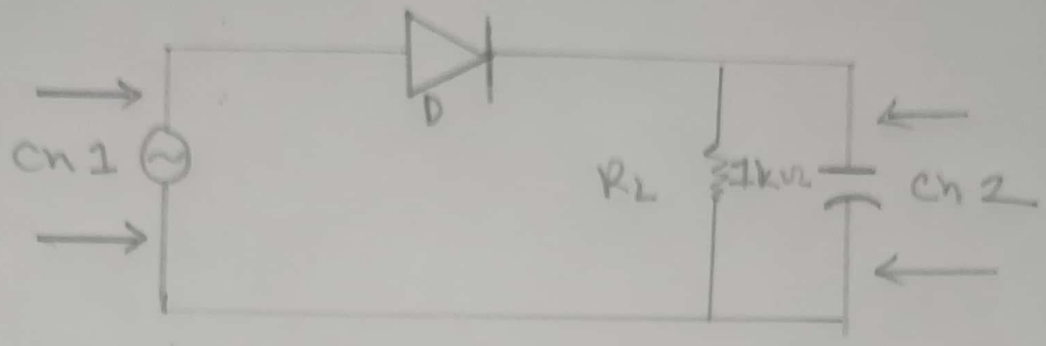

Figure: 2.3 Half wave rectifier

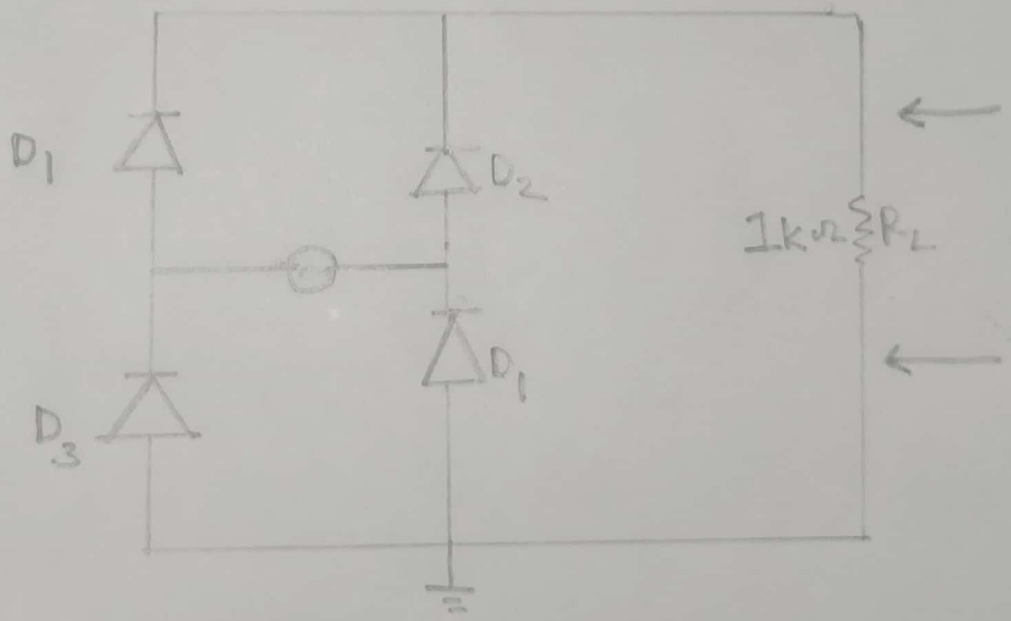

Figure: 2.4: Full wave rectifier

Description:

In electrical systems AC to DC conversion is one of the most essential factors. the Process of converting an Ac voltage to DC voltage is called rectification.

there are two types of rectifiers

Half wave rectifier, which is a type of rectifier that allows only one half cycle of an AC voltage wave form to pass while blocking the other half cycle.

Full wave rectifier, which is a type of rectifier that converts alternating current into continous current and that utilizes both halves of each cycle of the alternating current.

use of the capacitor:

the output voltage without the capacitor hay not attained a DC shape. Instead it is an AC without its negative cycle. Now the way to achieve a DC voltage is to add a capacitor in parallel with lowers resistance, before catching the next peak it will get dischanged. So, a capacitor with highers capacitance is incumbent.

Experimental Data table:

Calculation:

Result:

Discussion:

All the connections should be verified. the Resistance should be chosen within the range of kohm. Best performance is being obtained within 50Hz to 1 MHz.

GREEN UNIVERSITY OF BANGLADESH

Department of Computer Science & Engineering

Course Code: EEE-204

Course Title: Electronics lab

Experiment Number : 03
Experiment Name : Study of Operational Amplifier as Zero Crossing & Voltage Level Detectors

Date of Performance : 02.03.2021
Date of Submission : 05.04.2021

Submitted to:
Name : Sakib Abdul Ahad
Designation : Lecture
Dept : EEE

Submitted by:
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ID : 193002101
Dept. : CSE

Remark

Objectives:

1. To get familiarized with Operational Amplifier
2. To study OP-Amp as a Comparator.

Instruments Required:

Serial	Name	Ratings	Quantity
1	Project Board		1 Piece
2	OP-AMP		1 Piece
3	Resistor		1 Piece
4	Signal Generator		1 unit
5	Oscilloscope		1 unit
6	Analog Trainer Board		1 unit
7	Chards and wire		lot

Description:

In open loop connection there is no feedback between the output and input terminal. The OP-AMP in this experiment will be operated as a comparator.

If the voltage of non-inverting input terminal it is E^+ and the voltage of the inverting input terminal is E^-, then,

the output, $V_o = +V_{sat}$, when $E^+ > E^-$

And $V_o = -V_{sat}$, when $E^+ < E^-$

Using this concept we can use it to detect any zero crossing voltage or to identify any voltage level.

Circuit Diagram:

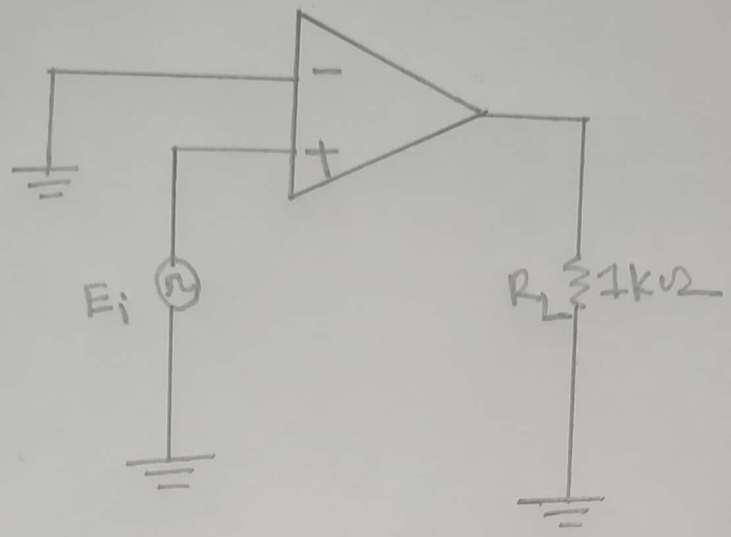

Figure: circuit diagram 1: non-inverting

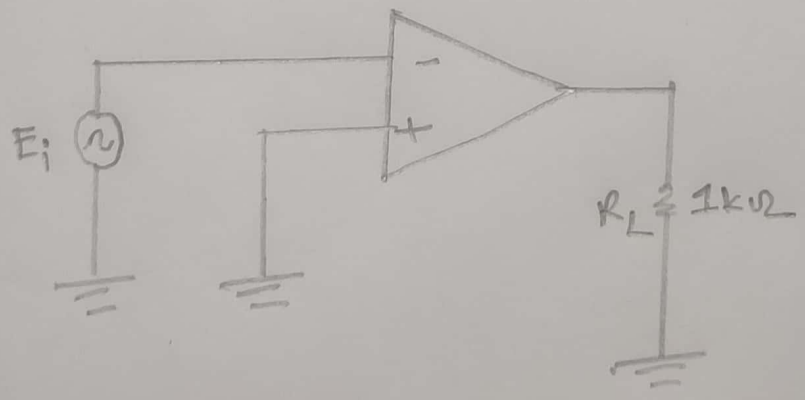

Figure: circuit diagram 2: inverting

Experimental Data table:

Calculation:

Result :

Discussions :

GREEN UNIVERSITY OF BANGLADESH

Department of Computer Science & Engineering

Course Code: EEE-204

Course Title: Electronics lab

Experiment Number : 04
Experiment Name : Study of Operational Amplifier as an Amplifier

Date of Performance : 30.03.2021
Date of Submission : 05.04.2021

Submitted to:
Name : Sakib Abdul Ahad
Designation : Lecture
Dept : EEE

Submitted by:
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ID : 193002101
Dept. : CSE

Remark

Objectives:

1. To get familiarized with the use of OP-AMP as amplifiers.
2. To study the behaviour of inverting and non-inverting amplifiers.

Instruments Required:

Serial	Name	Ratings	Quantity
1	Project Board		1 piece
2	OP-AMP		1 piece
3	Resistor		1 piece
4	Signal Generator		1 unit
5	Oscilloscope		1 unit
6	DC Power Supply		1 unit
7	Multimeter		1 unit
8	Chords and wire		lot

Circuit Diagram:

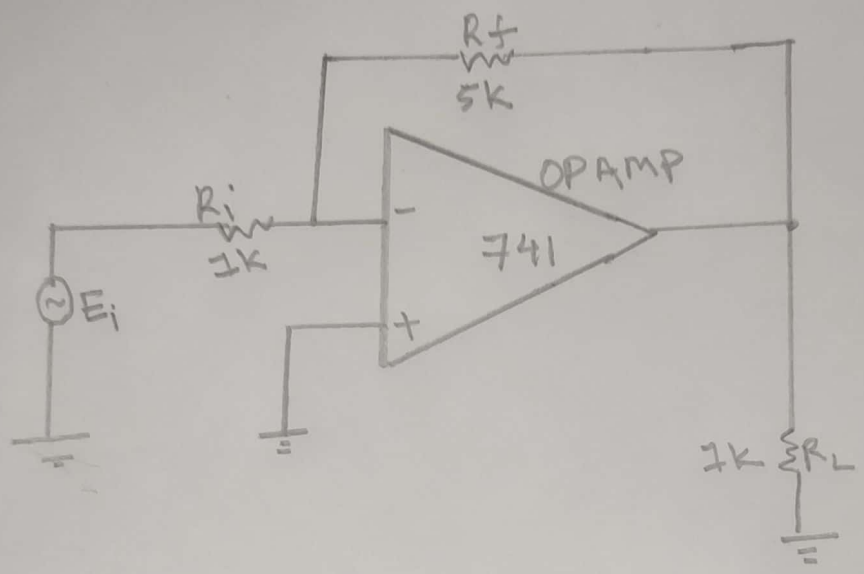

Figure: Circuit Diagram 1

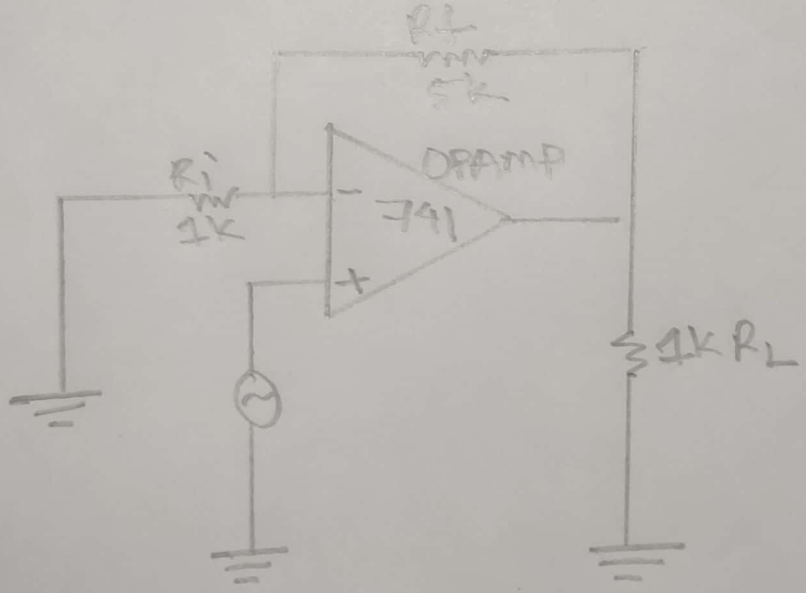

Figure: Circuit Diagram 2

Description:

The two widely used closed loop amplifiers using OPAmp are-

1. Inverting Amplifiers
2. Non-inverting Amplifiers

In both the cases the closed loop gain of the Amplifiers is determined by the input resistance R_i and the feedback resistance R_f

Inverting Amplifiers: In an inverting amplifiers the input is applied at the inverting input pin. the output obtained here is inverting. the close loop gain for this type of amplifiers is given by

$$A_{CL} = -R_f / R_i$$

non inverting Amplifiers: In this type of amplifiers the input is applied at the non-inverting input whereas the output is not inverting. the close loop gain for this type of amplifiers is given by

$$A_{CL} = (1 + R_f / R_i)$$

Experimental Data table:

Calculation:

Result:

Discussions: