

# **Project Report**

On

## **“Automatic Night lamp”**

Department of Physics

By

**Miss. Mojad Mayuri Dhondiram**

In partial fulfillment of the award of degree

Bachelor of Science

In

**PHYSICS**

S.V.K.T College, Deolali Camp,

Nashik -422401

SAVITRIBAI PHULE PUNE UNIVERSITY (SPPU),

PUNE -411007

Year 2022-2023

# CERTIFICATE

Nashik District Maratha Vidya Prasarak samaj's  
S .V.K.T. Art ,Commerce And Science College,  
Deolali Camp, Nashik-422401.

## DEPARTMENT OF PHYSICS

This is to certify that **Miss. Mojad Mayuri Dhondiram** Of class B.sc (Physics), has satisfactorily completed his project work as per rule laid down by the University of Pune entitled "**Automatic Night lamp**" During academic year 2022-2023

Prof .S .S. Sirsath .

Project Guide

Prof .M. K .Zate.

Head of Department

Examiner

# ACKNOWLEDGEMENT

My deep gratitude goes first to professor M.K.ZATE & S.S.SIRSATH ,Who expertly guide me through my gratitude education and who shared the excitement of year's of discovery experience.3Their unwavering enthusiasm for physics kept me constantly engaged with my research ,and their personal generosity helped make my time at Project of AUTOMATIC NIGHT LAMP enjoyable.

Thanks also go to Pro. M.K.ZATE. &Prof. S.S.SIRSATH who enlivened the subbasement of Sloan with good Physics and humour. H.S.C Textbook and Internet also helped me to do.

Above ground, I m indebted to my family, Whose value to me only grows with age. And Finally I m acknowledge my mom dad n bro and who blessed me with life of joy in hours when lab Lights off.

Yours obediently,

MOJAD MAYURI DHONDIRAM

T. Y. Bsc. 2022-2023

## Abstract

In some cities and villages, sometimes street lights glow in day time without any reason. In mining regions people face many difficulties due to absence of light in the nights. In frontier and hilly areas, people face many problems due to damaged street lights. For solving these problems, we create a device in which the lights glow in night and in day time, they get switched off automatically and don't glow. Due to use of it, we can solve above problems and can also save electricity.



## Objective

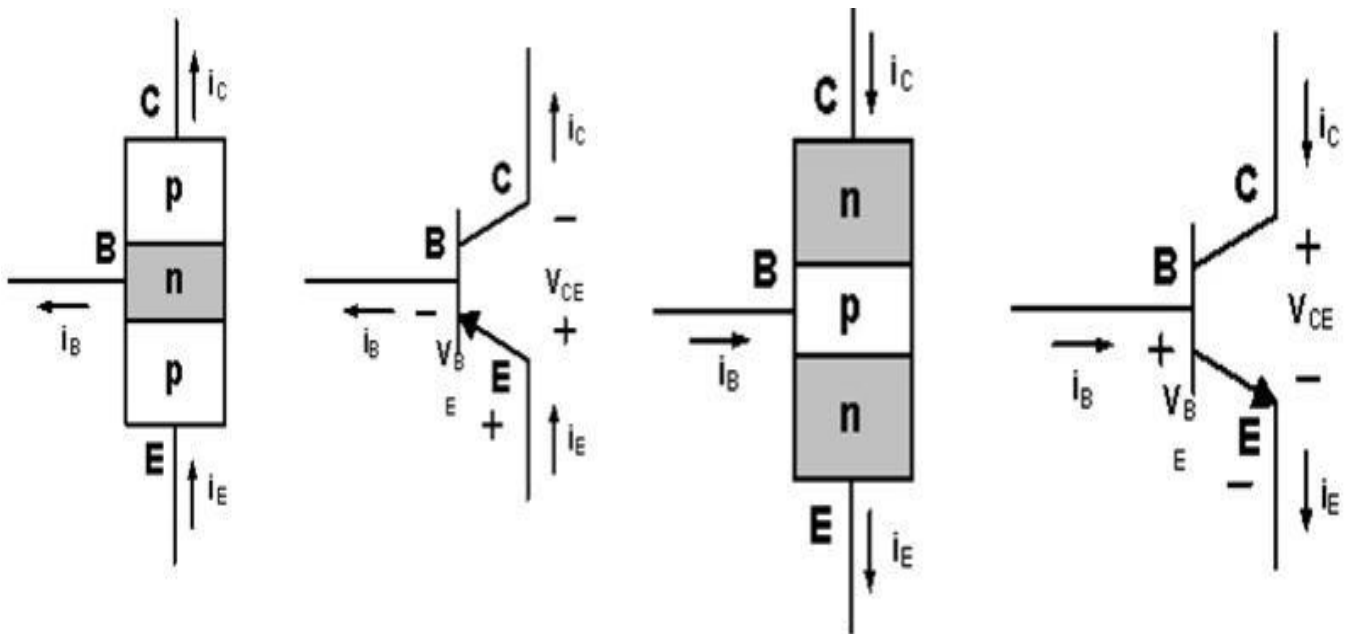
To construct an automatic night lamp using a transistor and LDR



# Theory

## 1. Transistor:

A transistor is a semiconductor device used to amplify or switch electronic signals and electrical power. It is composed of semiconductor material with three terminals for connection to an external circuit.



Emitter (E): It is the left hand side thick layer of the transistor which is heavily doped;

Base (B): It is a central thin layer of transistor which is lightly doped;

Collector (C): It is the right hand side thick layer of the transistor which is moderately doped;

A p-n-p junction transistor is obtained by growing a thin layer of thin layer of n-type semi-conductor in between two

relatively thick layers of p-type semiconductor.

A n-p-n junction transistor is obtained by growing a thin layer p-type semiconductor in between two relatively thick layers of n-type semiconductor.

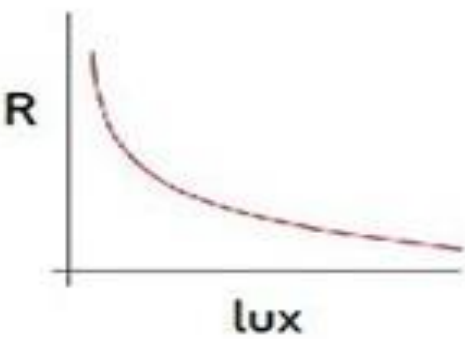
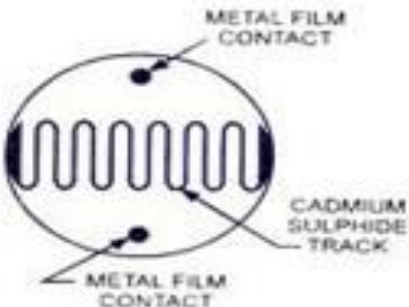
In the project, common emitter n-p-n transistor (BC-547) is used.

## 2. CARBON RESISTOR:

A carbon resistor has generally four rings or bands A, B, C and D of different colours corresponding to the value of

resistance. In project, we use carbon resistance of 1M ohms and 330 ohms.

**3. LDR:**LDR means light dependent resistance which is used to complete the circuit.



#### 4. LED:

A light-emitting diode (LED) is a semiconductor light source. When a light-emitting diode is forward-biased (switched on), electrons are able to recombine with electron holes within the device, releasing energy in the form of photons. In this project, we use led of white colour

#### 5. BATTERY:

This is a rectangular prism shape with rounded edges and a polarized snap connector at the top. In project, we use 9-Volt battery.

**6. WIRES:**A wire is a single, usually cylindrical, flexible strand or rod of metal. These are used to connect components.

### **7. BREADBOARD (PCB BOARD):**

A breadboard is a construction base for prototyping of electronics. Because the Solderless breadboard does not require soldering, it is reusable. Pcb board required soldering, it is not reusable.

# Materials Required:

1. A n-p-n transistor;
2. Breadboard;
3. Resistors:  $330\Omega$ ,  $1M\Omega$
4. Connecting Wires;
5. LED;
6. LDR;
7. 9V Battery;



## Principle:

This project is based on Light Dependent Resistance (L.D.R.). LDR is a resistance, in which opposing power of current depends on the presence of quantity of light present, i.e. the resistance of LDR increases or decreases, according to quantity of light which falls on it. If LDR places in darkness, the resistance of LDR increases and when light falls on it, the resistance of LDR decreases and act as a conductor. Any LDR in the presence of light and darkness changes its resistance is depending on the different types of LDR.

## Procedure:

- Take a breadboard and connect its two halves
- Connect a 9V battery on the breadboard.
- Connect an NPN transistor on the breadboard with its three legs (Emitter, Base, Collector) inserted in three different columns of the breadboard.
- The emitter of the transistor is grounded. Connect one leg of a 1 M $\Omega$

resistor to the base of the transistor, and its other leg to any different column of the breadboard. Connect the corresponding column to Vcc.

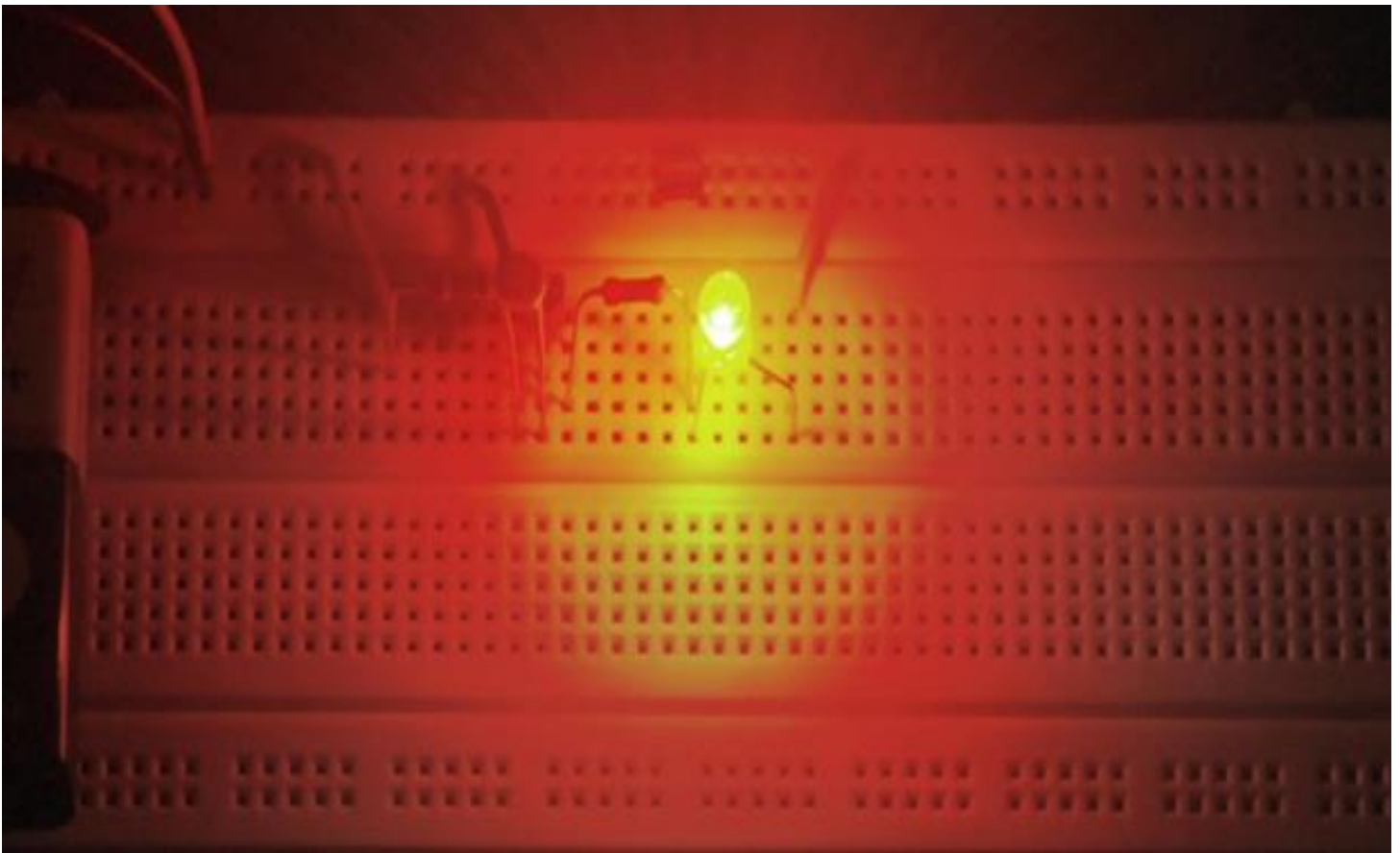
- Connect an LDR between the base and emitter of the transistor.

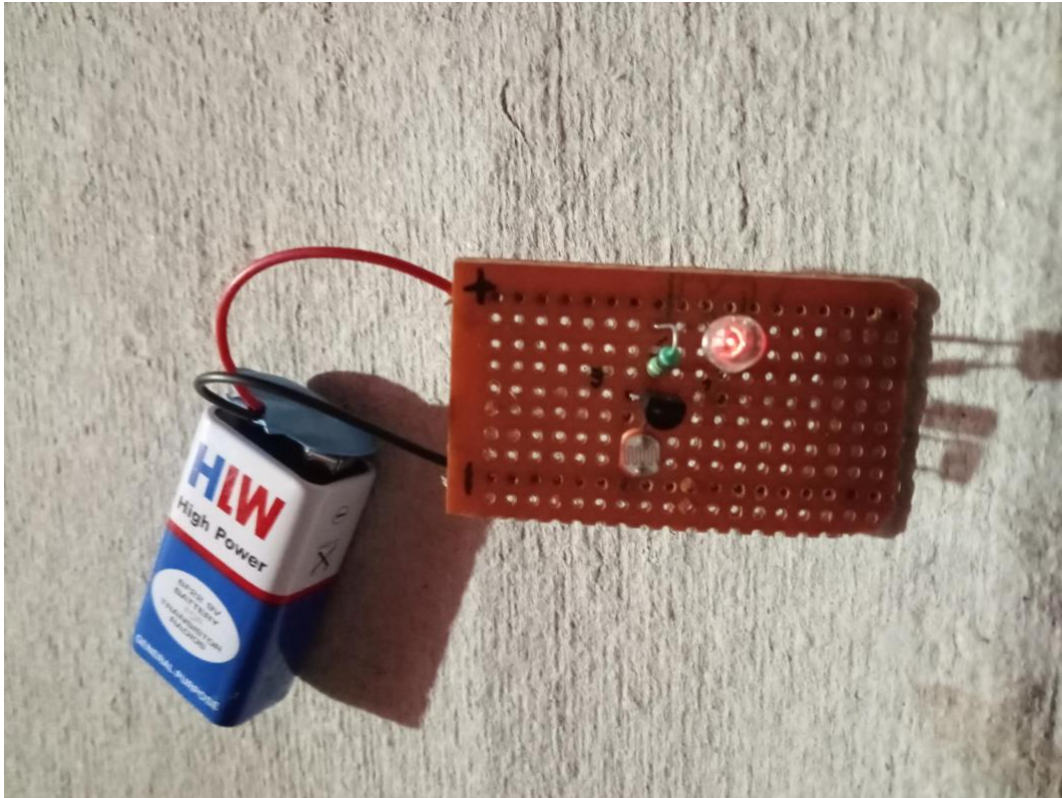
- Connect one leg of a 330  $\Omega$  resistor to the collector of the transistor, and its other leg to any different column of the breadboard.

- Take an LED. Connect its negative terminal to the right leg of 330  $\Omega$  resistor, and its positive terminal to Vcc.

## Observation Table:

When the circuit is exposed to light, the led remains off. When the circuit is taken into dark, the led glows.





## Precautions:

- Excess current should not be passed through LED.
- Make all the connections neat, clean and tight.

- Never exceed the ratings for the current given in the transistor manual.

## References:

- [colorado.edu/physics/phys3330/PDF/Experiment7.pdf](http://colorado.edu/physics/phys3330/PDF/Experiment7.pdf)
- [en.wikipedia.org/wiki/Transistor](http://en.wikipedia.org/wiki/Transistor)

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- [tedpavlic.com/teaching/osu/ece327/lab1\\_bjt/lab1\\_bjt\\_transistor\\_basics.pdf](http://tedpavlic.com/teaching/osu/ece327/lab1_bjt/lab1_bjt_transistor_basics.pdf)
- [hyperphysics.phy-astr.gsu.edu/hbase/solids/trans.html](http://hyperphysics.phy-astr.gsu.edu/hbase/solids/trans.html)

*A*

*Project report*

*On*



University of Pune

*Proximity Sensor*

*Department of Physics*

*By*

*Miss. Dakhore Drushti Baban*

*B.Sc ( Physics)*

*Under The Guidance*

*Prof. M.K.Zate*

*Department of Physics*

*S.V.K.T. Arts, Commerce and Science College Deolali  
camp*

*University of Pune*

*Year 2022-2023*



*Maratha Vidya Prasarak*

*Smt. Vimlaben Khimji Tejookaya Arts, Commerce and Science College, Deolali camp*



*University of Pune*

*Department of Physics*

*Certificate*

*This is to certify that **Miss. Dakhore Drushti Baban**  
Of class B.Sc. (physics) , has satisfactorily completed his project work as per rule laid  
down by the University of Pune entitled*

*“ Proximity Sensor”*

*During academic year 2022-2023*

*Prof.M.K.Zate.*

*Prof.M.K.Zate*

*Project Guide*

*Examiner*

*Head of Department*

#### ❖ **ACKNOWLEDGEMENT**

*It is my great pleasure to acknowledge the assistance and contribution of the individuals who co-operated me to complete the project work successfully. First and foremost, I wish to express my deep gratitude and thanks to prof. M.K.Zate for their enthusiastic guidance and helping in successful completion of project work. They provided us their precious time for valuable suggestions and encouragement throughout the work. It is for their patience, guidance and encouragement at all time that this work has shaped up the way it is. A project is reflects the contribution of many people. A number people contributed their time and efforts in making their project work a success. We would like to thank everyone who contributed their time and efforts to help in completing the project work.*

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❖ **ABSTRACT**

It gives us a great pleasure to introduce "Touch less doorbell" as the 3<sup>rd</sup> year project in our B.Sc. course. The project is based on an object detecting using an IR sensor. An IR sensor consists of an IR LED and a photodiode. Together they are called as Photo-Coupler or Opto-Coupler. The touchless doorbell consists of an IR LED, photodiode, resistors, potentiometer, general LED with a buzzer, etc. Such a way that whenever any object comes close to the IR sensor, the buzzer and the LED glow. This concept of touchless doorbell is very useful as a fire engines, railroad crossing, school bells and alarm in industrial plants etc. This system is suitable for securing doors.

## ❖ INTRODUCTION

Infrared technology addresses a wide variety of wireless applications. The main areas are sensing and remote controls. In the electromagnetic spectrum, the infrared portion is divided into three regions: near infrared region, mid infrared region and far infrared region. The wavelengths of the regions and their applications are shown below.

- Near infrared region - 700 nm to 1400 nm - IR sensors, fiber optic
- Mid infrared region- 1400 nm to 3000 nm- Heat sensing
- Far infrared region - 3000 nm to 1 mm - Thermal imaging

The frequency range of infrared is higher than microwave and lesser than visible light for optical sensing and optical communications, photo optics technologies are used in the near infrared region as the light is less complex than RF when implemented as a source of signal. Optical wireless communication is done with IR data transmission for short range applications. An infrared sensor emits and for detects infrared radiation to sense its surroundings. The working of any Infrared sensor is governed by three laws: Planck's Radiation law, Stephen Boltzmann law and Wien's Displacement law, Planck's law states that every object emits radiation at a temperature not equal to 00K". Stephen Boltzmann law states that "at all wave lengths, the total energy emitted by a black body is proportional to the fourth power of the absolute temperature. According to Wien's Displacement law, "the radiation curve of a black body for different temperatures will reach its peak at a wavelength inversely proportional to the temperature". The basic concept of an Infrared Sensor which is used as Obstacle detector is to transmit an infrared signal, this infrared signal bounces from the surface of an object and the signal is received at the infrared receiver. But there are five basic elements used in a typical infrared detection system an infrared source, a transmission medium, optical component, infrared detectors or receivers and signal processing. Infrared lasers and Infrared LED's of specific wavelength can be used as infrared sources. The main types of media used for infrared transmission are vacuum, atmosphere and optical fibers. Optical components are used to focus the infrared radiation or to limit the spectral response. Optical lenses made of Quartz, Germanium and Silicon are used to focus the infrared radiation. Infrared receivers can be photodiodes, phototransistors etc. some important specifications of infrared receivers are photosensitivity, directivity and noise equivalent power. Signal processing is done by amplifiers as the output of infrared detector is very small.



### **WHAT IS A PROXIMITY SENSOR?**

"Proximity Sensor" includes all sensors that perform non-contact detection in comparison to sensors, such as limit switches, that detect objects by physically contacting them. Proximity Sensors convert information on the movement or presence of an object into an electrical signal. There are three types of detection systems that do this conversion: systems that use the eddy currents that are generated in metallic sensing objects by electromagnetic induction, systems that detect changes in electrical capacity when approaching the sensing object, and systems that use magnets and reed switches.

The Japanese Industrial Standards (JIS) define Proximity Sensors in JIS C 8201-5-2 (Low-voltage switchgear and controlgear, Part 5: Control circuit devices and switching elements, Section 2: Proximity switches), which conforms to the IEC 60947-5-2 definition of non-contact position detection switches.

JIS gives the generic name "proximity switch" to all sensors that provide non-contact detection of target objects that are close by or within the general vicinity of the sensor, and classifies them as inductive, capacitive, ultrasonic, photoelectric, magnetic, etc.

This Technical Explanation defines all inductive sensors that are used for detecting metallic objects, capacitive sensors that are used for detecting metallic or non-metallic objects, and sensors that utilize magnetic DC fields as Proximity Sensors.

#### ❖ **COMPONENTS REQUIRED**

- LM 358 IC
- InfraRed LED PhotoDiode Transmitter, LDR
- Resistors: 470, 270R, 10K
- Potentiometer: 10K
- Pcb or breadboard
- 9v battery and clip
- Led
- Buzzer
- Iç base

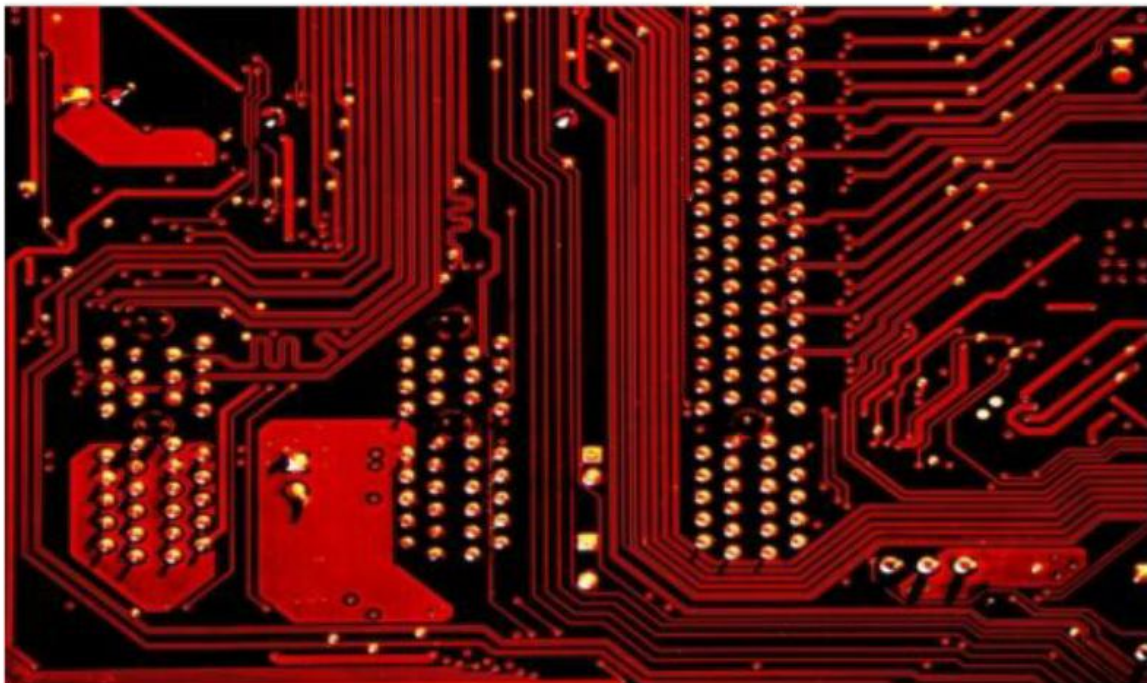
### **❖ PCB CONNECTION**

**A 'PCB' or Printed Circuit Board connects electrical components on a conductive track or between pads on the board. Some devices hold more than one PCB and will utilise a variety of equipment to build a connection between the boards.**

**PCB connectors are mounted on the PCB and are typically used to transfer signals or power from one PCB to another, or to transfer to or from the PCB from another source within the unit.**

**Connectors provide an easy method of Design for Manufacture, as the PCBs are not hard-wired to each other and can be assembled later in a production process.**

**There are different types of PCB connectors that have different roles to play on the board. The final application will determine the Size, Weight and Power (SWaP) properties of the connectors used in the PCB design.**



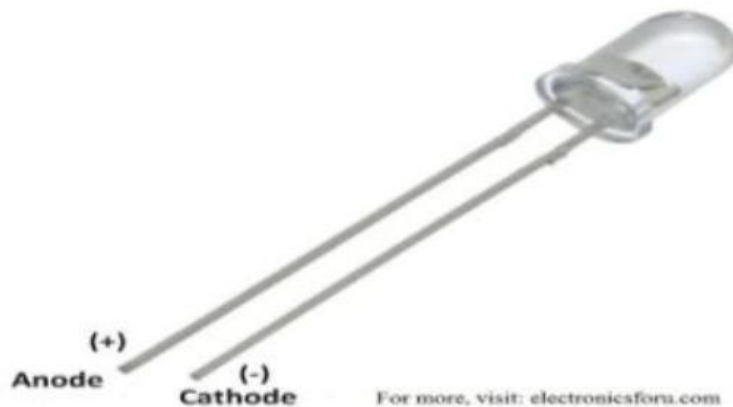
## ❖ IR LED

An Infrared light-emitting diode (IR LED) is a special purpose LED emitting infrared rays ranging from 700 nm to 1 mm wavelength. Different IR LEDs may produce infrared light of differing wavelengths, just like different LEDs produce light of different colors.

IR LEDs are usually made of gallium arsenide or aluminium gallium arsenide. In complement with IR receivers, these are commonly used as sensors.

The appearance of IR LED is same as a common LED. Since the human eye cannot see the infrared radiations, it is not possible for a person to identify if an IR LED is working. A camera on a cell phone camera solves this problem. The IR rays from the IR LED in the circuit are shown in the camera.

### • Pin Diagram of IR LED



An IR LED is a type of diode or simple semiconductor. Electric current is allowed to flow in only one direction in diodes. As the current flows, electrons fall from one part of the diode into holes on another part. In order to fall into these holes, the electrons must shed energy in the form of photons, which produce light.

It is necessary to modulate the emission from IR diode to use it in electronic application to prevent spurious triggering. Modulation makes the signal from IR LED stand out above the noise. Infrared diodes have a package that is opaque to visible light but transparent to infrared. The massive use of IR LEDs in remote controls and safety alarm systems has drastically reduced the pricing of IR diodes in the market.



## ❖ **LIGHT DEPENDENT RESISTOR LDR**

**Light dependent resistors, LDRs, or photoresistors are electronic components that are used to detect light & change the operation of a circuit dependent upon the light levels.**

*Light dependent resistors, LDRs or photoresistors are electronic components that are often used in electronic circuit designs where it is necessary to detect the presence or the level of light. LDRs are very different to other forms of resistor like the carbon film resistor, metal oxide film resistor, metal film resistor and the like that are widely used in other electronic designs. They are specifically designed for their light sensitivity and the change in resistance this causes.*



**Typical leaded light dependent resistor**

*These electronic components can be described by a variety of names from light dependent resistor, LDR, photoresistor, or even photo cell, photocell or photoconductor. Although other electronic components such as photodiodes or photo-transistor can also be used, LDRs or photo-resistors are a particularly convenient to use in many electronic circuit designs. They provide large change in resistance for changes in light level. In view of their low cost, ease of manufacture, and their ease of use, LDRs have been used in a variety of different applications. At one time LDRs were used in photographic light meters, and even now they are still used in a variety of applications where it is necessary to detect light levels.*

*Light dependent resistors are widely available:- they are normally stocked by electronic component distributors, and in view of the way the electronics industry supply chain operates these days, this is the normal way to obtain them. Electronic component distributors large and small will typically have a good selection.*

## ❖ POTENTIOMETER

A potentiometer is a three-terminal resistor with a sliding or rotating contact that forms an adjustable voltage divider.[1] If only two terminals are used, one end and the wiper, it acts as a variable resistor or rheostat.

Potentiometer

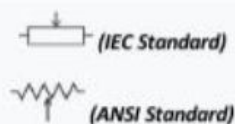
A typical single-turn potentiometer



Passive

Type

Electronic symbol



The measuring instrument called a potentiometer is essentially a voltage divider used for measuring electric potential (voltage); the component is an implementation of the same principle, hence its name.

Potentiometers are commonly used to control electrical devices such as volume controls on audio equipment. Potentiometers operated by a mechanism can be used as position transducers, for example, in a joystick. Potentiometers are rarely used to directly control significant power (more than a watt), since the power dissipated in the potentiometer would be comparable to the power in the controlled load.

### • WHAT IS POTENTIOMETER?

A potentiometer is a sort of measuring instrument. It's sometimes called POT which is short for potentiometer. Potentiometer definition is simple: It is considered as a three-terminal resistor and can control the flow of electric current. These voltage dividers can help you measure electrical potential or voltage. A potentiometer is referred to as a pot. A variable resistor is a potentiometer. A potentiometer is a three-terminal variable resistor that may be adjusted manually. A potentiometer is an important Product of employing Industrial Tools. Potentiometers are provided by several Suppliers And Companies, different manufacturers, and a lot of distributors and there are a lot of Potentiometers for sale on [Liquip](#).

## ❖ **BUZZER : WORKING & APPLICATIONS**

There are many ways to communicate between the user and a product. One of the best ways is audio communication using a buzzer IC. So during the design process, understanding some technologies with configurations is very helpful. So, this article discusses an overview of an audio signaling device like a beeper or **a buzzer and its working** with applications.

### • **WHAT IS A BUZZER?**

An audio signaling device like a beeper or buzzer may be electromechanical or **piezoelectric** or mechanical type. The main function of this is to convert the signal from audio to sound. Generally, it is powered through DC voltage and used in timers, alarm devices, printers, alarms, computers, etc. Based on the various designs, it can generate different sounds like alarm, music, bell & siren.



The pin configuration of the buzzer is shown below. It includes two pins namely positive and negative. The positive terminal of this is represented with the '+' symbol or a longer terminal. This terminal is powered through 6Volts whereas the negative terminal is represented with the '-' symbol or short terminal and it is connected to the GND terminal.

## ❖ 9V BATTERY

The nine-volt battery, or 9-volt battery, is an [electric battery](#) that supplies a nominal voltage of [9 volts](#). Actual voltage measures 7.2 to 9.6 volts, depending on battery chemistry. Batteries of various sizes and capacities are manufactured; a very common size is known as PP3, introduced for early [transistor radios](#). The PP3 has a rectangular prism shape with rounded edges and two polarized snap connectors on the top. This type is commonly used for many applications including household uses such as [smoke](#) and [gas detectors](#), [clocks](#), and toys.<sup>[1]</sup>

The nine-volt PP3-size battery is commonly available in primary [zinc-carbon](#) and [alkaline](#) chemistry, in primary [lithium iron disulfide](#) and [lithium manganese dioxide](#) (sometimes designated CRV9<sup>[2]</sup>), and in rechargeable form in [nickel-cadmium](#) (Ni-Cd), [nickel-metal hydride](#) (Ni-MH) and [lithium-ion](#). [Mercury batteries](#) of this format, once common, have been banned in many countries due to their toxicity.<sup>[3]</sup> Designations for this format include NEDA 1604 and IEC 6F22 (for zinc-carbon) or MN1604 6LR61 (for alkaline). The size, regardless of chemistry, is commonly designated PP3—a designation originally reserved solely for carbon-zinc, or in some countries, E or E-block.<sup>[4]</sup> A range of PP batteries was produced in the past, with voltages of 4.5, 6, and 9 volts and different capacities; the larger 9-volt PP6, PP7, and PP9 are still available. A few other 9-volt battery sizes are available: A10 and A29.<sup>[2]</sup>

Most PP3-size alkaline batteries are constructed of six individual 1.5 V LR61 cells enclosed in a wrapper.<sup>[5]</sup> These cells are slightly smaller than LR8D425 AAAA cells and can be used in their place for some devices, even though they are 3.5 mm shorter. Carbon-zinc types are made with six flat cells in a stack, enclosed in a moisture-resistant wrapper to prevent drying. Primary lithium types are made with three cells in series.<sup>[6]</sup>

9-volt batteries accounted for 4% of alkaline [primary battery](#) sales in the United States in 2007, and 2% of primary battery sales and 2% of [secondary \(rechargeable\) battery](#) sales in Switzerland in 2008.<sup>[7][8]</sup>



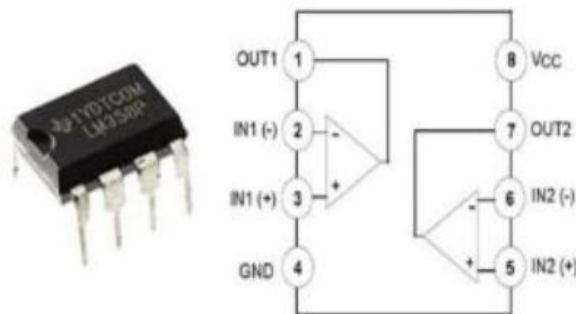


### ❖ LM358 IC

The LM358 contains two independent high gain operational amplifiers, low power, dual channel op-amp, high gain with internal frequency compensation. Single power supply will be required to operate both op-amps in LM358. We can also use a split power supply. The device has low power supply voltage.

LM358 IC can also be used as transducer standard operational amplifier and it is suitable for our needs. It can handle voltage from 3V to 32V DC supply and current up to 20mA per channel. It consists of 8 pins which contains two operational amplifiers.

In this IC we have two operational amplifier which can we use as a comparator. LM- The low power drain also makes the LM358 a good choice for battery operation. Generally we obtain signal from sensor are usually have small rating. We cannot do anything with this rating for example we obtain 0.3V from sensor. By using 0.3V we cannot ON/OFF led or relay. The LM-358 IC get signal from the sensor and compare to the reference voltage. Then this IC will decide whether the voltage is greater or less than reference voltage by giving



output high or low

versatile

uses it The LM358 Is a can be used as comparator to compare different signals, amplifying signals from a variety of transducers or sensors to dc gain blocks or any op-amp function.

## ❖ RESISTOR

The resistor is one of the most essential electrical and electronic component that is used in various electronic devices. These are available in different sizes as well as shapes in the market based on the application. We know that, any basic *electrical and electronic circuit's* works with the flow of current. Additionally, this is also categorized into two types namely *conductors* as well as *insulators*. The main function of *the conductor* is to allow the flow of current whereas *an insulator* doesn't allow the flow of current. Whenever a high voltage is supplied through a conductor like metal, then the total voltage will supply through it. If the resistor is connected to that conductor then the flow of current, as well as the voltage, will be restricted. This article discusses an overview of the resistor.

### • WHAT IS RESISTOR ?

The definition of *the resistor* is, it is a basic two-terminal *electrical and electronic component* used to restrict the current flow in a circuit. The resistance toward the flow of current will result in the voltage drop. These devices may provide a permanent, adjustable resistance value. The value of resistors can be expressed in Ohms.

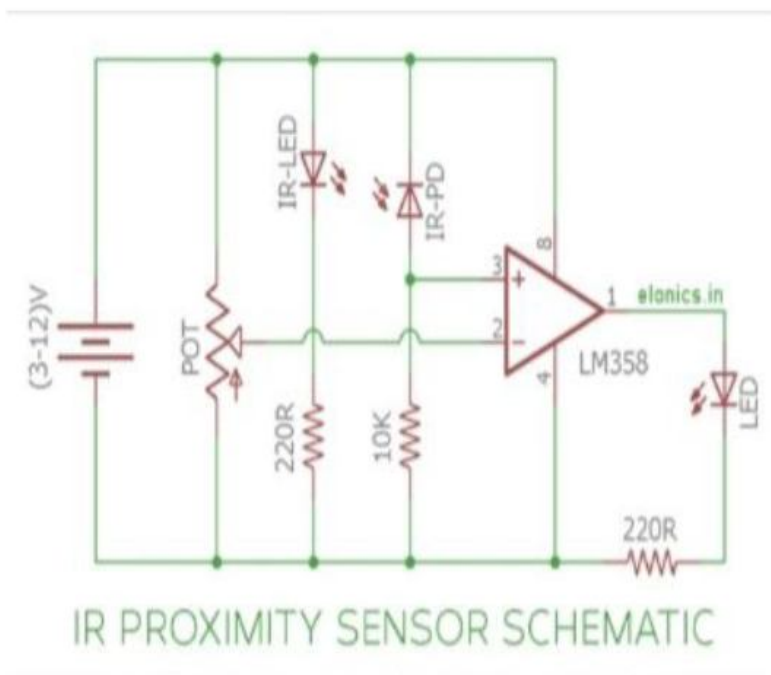


Resistor

Resistors are employed in several electrical as well as *electronic circuits* to make a known voltage drop otherwise current to voltage (C-to-V) relationship. When the flow of current in a circuit is identified then a resistor can be utilized for creating an identified potential difference which is proportional to the current. Similarly, if the voltage drop across two points in a circuit is identified, a resistor can be utilized for creating an identified current which is proportional to that dissimilarity.

## ❖ IR SENSOR : CIRCUIT DIAGRAM & WORKING

IR technology is used in daily life and also in industries for different purposes. For example, TVs use an **IR sensor** to understand the signals which are transmitted from a remote control. The main benefits of IR sensors are low power usage, their simple design & their convenient features. IR signals are not noticeable by the human eye. The IR radiation in the **electromagnetic spectrum** can be found in the regions of the visible & microwave. Usually, the wavelengths of these waves range from  $0.7 \mu\text{m}$  to  $1000 \mu\text{m}$ . The IR spectrum can be divided into three regions like near-infrared, mid, and far-infrared. The near IR region's wavelength ranges from  $0.75 - 3 \mu\text{m}$ , the mid-infrared region's wavelength ranges from  $3$  to  $6 \mu\text{m}$  & the far IR region's infrared radiation's wavelength is higher than  $6 \mu\text{m}$ .



## ❖ TYPES OF PROXIMITY SENSOR

### 1. Type: Capacitive

*Description: Constructed with two parallel plates as an open capacitor; targets induce changes in capacitance.*

*Range: 3-60 mm*

*Target: Non-ferrous materials*

*Speed: Relatively slow*

*Applications: Close-range, non-ferrous sensing; tank liquid level detection, sight glass monitoring.*

### 1. Type: Eddy Current

*Description: Similar to inductive sensors; could be considered high-end inductive types.*

*Range: Relatively short*

*Target: Ferrous materials*

*Speed: Average*

*Application: Precision, high-resolution sensing in contaminated environments.*

### 2. Type: Effect / Magnetic

*Description: Measures the presence or absence of object based on an external magnetic field.*

*Range: 4-40 mm*

*Target: Ferromagnetic*

*Speed: High*

*Application: Measurement of fast rotational velocity.*

### 3. Type: Inductive

*Description: Involve a wound iron core; coil inductance changes with presence of object within sensing range.*

*Range: 4-40 mm*

*Target: Ferrous materials*

*Speed: Average*

*Application: Close-range detection of ferrous materials; hazardous environments.*

### 4. Type: Photoelectric

*Description: Use laser emitters and reflectors or receivers; targets cut off or reflect emissions.*

*Range: 1-60 mm*

*Target: Many types*

*Speed: Average*

*Application: Long-range detection of small or large objects; automatic faucets, color-dependent sensing.*

### 5. Type: Ultrasonic

*Description: Similar to photoelectric types, but use sound waves instead of visible emissions.*

*Range: Up to ~400 mm*

*Target: Many types*

*Speed: Relatively high*

*Application: Long-range detection of multi-colored objects with varying surface properties; machine automation, continuous level control.*



#### ❖ FEATURES

1. Proximity Sensors detect an object without touching it, and they therefore do not cause abrasion or damage to the object. Devices such as limit switches detect an object by contacting it, but Proximity Sensors are able to detect the presence of the object electrically, without having to touch it.
2. No contacts are used for output, so the Sensor has a longer service life (excluding sensors that use magnets). Proximity Sensors use semiconductor outputs, so there are no contacts to affect the service life.
3. Unlike optical detection methods, Proximity Sensors are suitable for use in locations where water or oil is used. Detection takes place with almost no effect from dirt, oil, or water on the object being detected. Models with fluororesin cases are also available for excellent chemical resistance.
4. Proximity Sensors provide high-speed response, compared with switches that require physical contact. For information on high-speed response, refer to Explanation of Terms.
5. Proximity Sensors can be used in a wide temperature range. Proximity Sensors can be used in temperatures ranging from -40 to 200°C.
6. Proximity Sensors are not affected by colors. Proximity Sensors detect the physical changes of an object, so they are almost completely unaffected by the object's surface color.
7. Unlike switches, which rely on physical contact, Proximity Sensors are affected by ambient temperatures, surrounding objects, and other Sensors. Both Inductive and Capacitive Proximity Sensors are affected by interaction with other Sensors. Because of this, care must be taken when installing them to prevent mutual interference. (Refer to the Precautions for Correct Use in the Safety Precautions for All Proximity Sensors.) Care must also be taken to prevent the effects of surrounding metallic objects on Inductive Proximity Sensors, and to prevent the effects of all surrounding objects on Capacitive Proximity Sensors.
8. There are Two-wire Sensors. The power line and signal line are combined. If only the power line is wired, internal elements may be damaged. Always insert a load. (Refer to the Precautions for Safe Use in the Safety Precautions for All Proximity Sensors.)

---

❖ **ADVANTAGES**

- *Low power consumption*
- *There is no data leakage because of the ray direction*
- *These sensors are not affected by oxidation & corrosion*
- *Noise immunity is strong*
- *Detects motion when the light is present or absent*
- *These sensors are not affected by rust*
- *They do not need to get in touch with objects for detection.*
- *No data leakage because of the directionality infrared radiation of ray*
- *These are more modest in size and are more moderate.*
- *It responds very quickly as compared to thermocouples.*
- *It provides high reliability*

❖ **DISADVANTAGES**

- *Line of sight is required*
- *Range is limited*
- *These can be affected by fog, rain, dust, etc*
- *Less data transmission rate*
- *These sensors can be blocked with common objects.*
- *High force IR signals can harm human eyes*

### • **WORKING PRINCIPLE**

*The working principle of an infrared sensor is similar to the object detection sensor. This sensor includes an IR LED & an IR Photodiode, so by combining these two can be formed as a photo-coupler otherwise ~~optocoupler~~. The physics laws used in this sensor are planks radiation, Stephan Boltzmann & ~~weins displacement~~ IR LED is one kind of transmitter that emits IR radiations. This LED looks similar to a standard LED and the radiation which is generated by this is not visible to the human eye. Infrared receivers mainly detect the radiation using an infrared transmitter. These infrared receivers are available in photodiodes form. IR Photodiodes are dissimilar as compared with usual photodiodes because they detect simply IR radiation. Different kinds of infrared receivers mainly exist depending on the voltage, wavelength, package, etc.*

*Once it is used as the combination of an IR transmitter & receiver, then the receiver's wavelength must equal the transmitter. Here, the transmitter is IR LED whereas the receiver is IR photodiode. The infrared photodiode is responsive to the infrared light that is generated through an infrared LED. The resistance of photo-diode & the change in output voltage is in proportion to the infrared light obtained. This is the IR sensor's fundamental working principle.*

*Once the infrared transmitter generates emission, then it arrives at the object & some of the emission will reflect back toward the infrared receiver. The sensor output can be decided by the IR receiver depending on the intensity of the response.*

---

---

### ❖ **TROUBLESHOOTING GUIDE**

1. Double-check all connections by referring to the circuit diagram.
2. Check if the LED's are working properly. (Digital cameras can detect InfraRed light, so you can check if the InfraRed LED is working by using any digital camera)
3. The IR photo-diode used in this video is white and the IR LED is black. But it can also be the other way in your case. You can determine which one is LED/Photo-diode by connecting both the diode, photo-diode pair separately to the power supply (via a 220 resistor) and see which one glows using a digital camera.
4. At one extreme position of the potentiometer's knob, the LED should be off and at the other extreme position, the LED should be on. Now you can start turning the potentiometer's knob from the extreme position where the LED is on, until the LED just turns off. Now the IR proximity sensor should work properly.

## ❖ **EXPLANATION OF CIRCUIT'S WORKING**

The sensing component in this circuit is IR photo-diode. More the amount of InfraRed light falling on the IR photodiode, more is the current flowing through it. (Energy from IR waves is absorbed by electrons at p-n junction of IR photodiode, which causes current to flow) This current when flows through the 10k resistor, causes potential difference (voltage) to develop. The magnitude of this voltage is given by Ohm's law,  $V=IR$ . As the value of resistor is constant, the voltage across the resistor is directly proportional to the magnitude of current flowing, which in turn is directly proportional to the amount of Infra-Red waves incident on the IR photodiode.

So, when any object is brought nearer to the IR LED, Photo-Diode pair, the amount of IR rays from IR LED which reflects and falls on the IR photodiode increases and therefore voltage at the resistor increases (from the deduction in previous para).

We compare this voltage change (nearer the object, more is the voltage at 10K resistor / IR photodiode) with a fixed reference voltage (Created using a potentiometer).

Here, LM358 IC (A comparator/OpAmp) is used for comparing the sensor and reference voltages. The positive terminal of photodiode (This is the point where the voltage changes proportion to object distance) is connected to non-inverting input of OpAmp and the reference voltage is connected to inverting input of OpAmp.

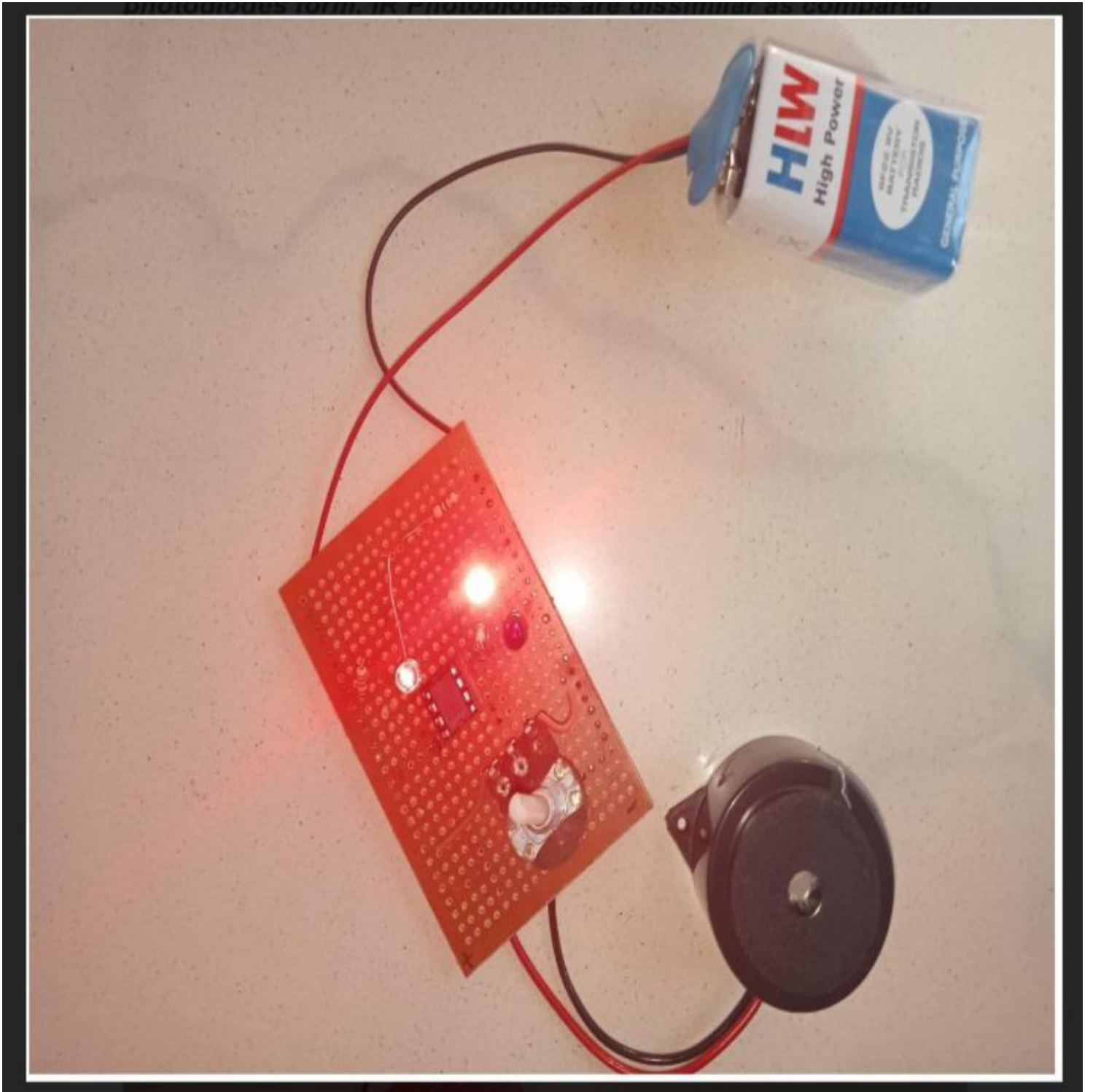
The OpAmp functions in a way that whenever the voltage at non-inverting input is more than the voltage at inverting input, the output turns ON.

When no object is near the IR proximity sensor, we need LED to be turned off. So we adjust the potentiometer so as to make the voltage at inverting input more than non-inverting.

When any object approaches the IR proximity sensor, the voltage at photodiode increases and at some point the voltage at non-inverting input becomes more than inverting input, which causes OpAmp to turn on the LED.

In the same manner, when the object moves farther from the IR proximity sensor, the voltage at non-inverting input reduces and at some point becomes less than inverting input, which causes OpAmp to turn off the LED.





## ❖ **CONCLUSION**

*There are five basic elements used in a typical infrared detection system . an infrared source a transmission medium, optical components, infrared detector or receiver and signal processing . infrared laser and infrared LED's of specific wavelength can be used as infrared sources. The three main types of media used for infrared transmission are vacuum, atmosphere and optical fibers. optical components are used to focus the infrared radiation or to limit the spectral response. Optical lenses made of Quartz, Germanium and Silicon are used to focus the infrared radiation . Infrared receiver can be photodiode , phototransistor etc. some important specifications of infrared receiver are photosensitivity , detectivity and noise equivalent power . Signal processing is done by amplifier as the output of infrared detector is very small.*





**A Report**



**MVP Samaj's**

**S.V.K.T. Arts, Science and Commerce College  
DeolaliCamp, Nashik.  
Department of  
CommerceInternship  
Programme (2022-2023)**

**(Cost and Work Accounting)  
DEGREE BACHLORS OF  
COMMERCE  
UNDER SAVITRIBAI PHULE  
PUNEUNIVERSITY PUNE  
Third Year B. Com.  
(Semester V)  
Under Choice Based Credit  
System(Duration 60 hours)**

**Subject: Cost and Work Accounting**

**Name of the Student: Shrawasti dagadu Sonawane**

**Roll No: 105080**

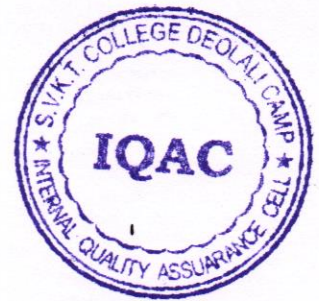
**Name of Subject Teacher: Mr. Santosh Kardak and Mrs.Shweta  
Shrimali**

**Name of the organization for Internship: Dainik Vishwapath Press**

*CS2dca*  
19/10/2023  
*Kardak*

*Shweta*

*Kamran*



## **Objectives of the Internship Program**

- ▣ To acquire the Knowledge, skills and ability of the subject **Cost and Work Accounting II & III** to seek job opportunity / start up business.
- ▣ To Receive valuable work Experience.
- ▣ To explore Career path.
- ▣ To learn various skills that required to Corporate/ Business.
- ▣ To prepare to cope up changing environment
- ▣ To make place in Job Market.
- ▣ To earn credits as per the university guideline.
- ▣ To adopt work culture in a team.
- ▣ To understand the responsibility,Accountability

## **Nature of the Internship**

- ▣ To undergo sixty hours of practical training in business establishments.
- ▣ Period (Date :10/02/2023 To 22/02/2023)

## **Pre Soft Skills acquired**

Soft Skills are acquired before Joining Internship this may be helpful for Internship program.

- ▣ - Social Etiquettes and Manners
- ▣ – Accounting Manners
- ▣ - Effective Costing
- ▣ - Listening Skills
- ▣ - Group Discussion Skills
- ▣ – All Types of Overheads.

With these Skills Computer Skills – MS-CIT , MS-WORD, MS-EXCEL, MS-POWERPOINT. ETC





## Details About Organisation

- ☐ Name of the organization: Dainik Vishwapath Press
- ☐ Address: **Ghanashyam Complex, Subhash Road, Dombivali West, 421201**
- ☐ Nature: Manufacturer of News Paper
- ☐ Owner of the Business: Mr. Dinkar Sonkamble
- ☐ Email Id: **dailyvishvapath@gmail.com**
- ☐ Contact No: **9892756702**
- ☐ Website: **www.vishwapath.com**
- ☐ About Business: **manufacturer of News Paper**
- ☐ Turnover per Year:

**Core Area:** Cost And Work Accounting II & III

**Special Area:**1) Different types of cost used in Manufacturing

- 2) cost techniques used in the industry and practical analysis of cost
- 3) **Overheads Coasting**

## **Detailing:**

Demand and Supply Cost, Quotation, Billing, Right skills, Cost And management



### **Proposed outcome of the internship program**

The internship programmer will provide valuable work experience. It will help to explore a career path and develop and refine skills that will eventually give an edge in the job market.

### **Acknowledgment:**

- ▣ I'm extremely grateful to **Mr. Dinkar Sonkamble** I'd like to express my deepest thanks  
To **Dainik Vishwapath Press**. I would like to extend my deepest gratitude to **Mr. Dinkar Sonkamble**
- ▣ Principal Dr.S.S Kale Subject Teacher – **Mr. Santosh Kardak and Mrs.Shweta Shrimali**  
Department Head **Mr. Santosh Kardak**, , University- Savitribai Phule Pune University ,Concern organization, My Parents, friends etc.
- ▣ For supporting internship Program.





M.V.P.Samaj's  
Smt. Vimlaben Khimji Tejookaya  
**ARTS, SCIENCE & COMMERCE COLLEGE**  
Deolali Camp, Nashik-422 401

A  
**PROJECT REPORT**  
ON  
**“A STUDY OF JOB SATISFACTION OF EMPLOYEES  
IN DATAMATICS GLOBAL SERVICES LTD”**

*In the Partial fulfillment of the requirement of the degree of  
MASTER OF COMMERCE (M.COM)*

*Submitted to*  
SAVITRIBAI PHULE PUNE UNIVERSITY

**SUBMITTED BY**

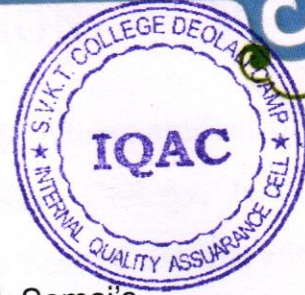
Bhavana D. More  
(M.Com. II, Sem.IV)

**PROJECT GUIDE**

Dr. Urmila Y. Gite  
M.Com., DTL, GDC&A, MBA, NET, Ph.D

**2022 – 2023**





Maratha Vidya Prasarak Samaj's

**Smt. Vimlaben Khimji Tejookaya**  
**ARTS, SCIENCE AND COMMERCE COLLEGE,**  
Deolali Camp, Dist. Nashik

## CERTIFICATE

This is to Certify that,

Shri/ Miss More Shavana Dhanising  
of M.Com Part II (Sem. IV) Seat No. \_\_\_\_\_ has  
satisfactorily completed his/her Project Work in the Subject  
of A Study of Job Satisfaction of  
Empolyees In Datamatics Global Services Ltd.  
as partial fulfillment for the degree of Master of Commerce,  
as laid down by the Savitribai Phule Pune University for  
the Academic Year 2022-23.

Ugib  
Project Guide

Dr. Umila Y. Kite  
Ugib  
(Internal Examiner)

Dr. V. G. Gaikwad  
H.O.D.

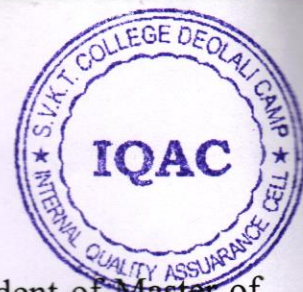
Dr. S. S. Kale  
Principal

Jadhav  
(External Examiner)

Jadhav R.V.



## DECLARATION




This is to declare that I, **Bhavana D. More**, student of Master of Commerce (M.Com) (2022-2023), S.V.K.T. College, NASHIK have given original data and information to the best of my knowledge in the project report title “**A Study of Job Satisfaction of Employees in Datamatics Global Securities Ltd**” under the guidance of **Project Guide Dr.Urmila Y. Gite** and that, no part of this information has been used for any other assignment but for the partial fulfillment of the requirement towards the completion of the said course.

I have prepared this report independently and I have gathered all the relevant information personally. I have prepared this project for Master of Commerce (M.Com.) for the year 2022-2023.

I also agree in principal not to share the vital information with any other person outside the organization and will not submit the project report to any other university.

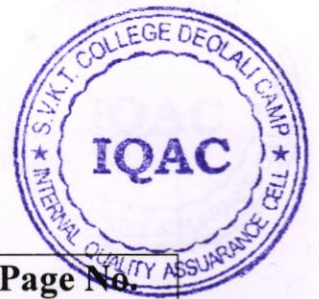
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Bhavana D. More

Date: / /

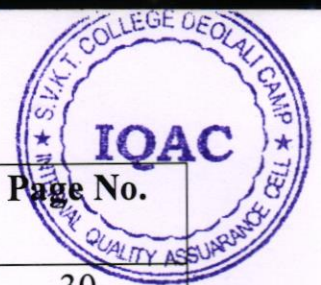


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# CHAPTER – 1

## INTRODUCTION

### 1.0 Introduction :

Human resource is considered to be the most valuable asset in any organization. It is the sum total of inherent abilities, aptitudes of the employed persons who comprise executives, supervisors and the rank and file employees. The human resources should be utilized to the maximum possible extent, in order to achieve individual and organizational goals. It is thus the employee's performance which ultimately decides the attainment of goals. Hence, the employee's performance is to a large extent influenced by motivation and job satisfaction.

Job satisfaction is all about how one feels about (or towards) one's job. An employee who expresses satisfaction is said to have a positive attitude towards the job, unlike a dissatisfied employee who has a negative attitude towards the job. A person having negative attitude shows a personality disposition which is inclined to experience nervousness, tension, worry, upset and distress, whereas those with positive attitude will feel happy with themselves, others, and with their work.

Job satisfaction reflects the extent to which people find gratification or fulfillment in their work. Job satisfaction shows that personal factors such as an individual's needs and aspirations determine his/her attitude, along with group and organizational factors such as relations with co-workers and supervisors and working conditions, work policies, and compensation. A satisfied employee tends to be absent less often, to make positive contributions, and to stay with the organization. The effect of job satisfaction goes beyond organizational setting. Satisfied employees are more likely to be satisfied citizens. These people



will hold a more positive attitude towards life in general and make for a society or *more psychological healthy*.

### **1.1 Concept :**

Employee satisfaction is the terminology used to describe whether employees are happy and contented and fulfilling their desires and needs at work. Many measures meaning that employee satisfaction is a factor in employee motivation, employee goal achievement, and positive employee morale in the workplace.

As per Vroom Employee Satisfaction is a positive orientation of an individual towards a work role which he is presently occupying"

Employee satisfaction is a measure of how happy workers are with their job and working environment. Keeping morale high among workers can be of tremendous benefit to any company, as happy workers will be more likely to produce more, take fewer days off, and stay loyal to the company.

### **1.2 Meaning and Definitions of Employee Job Satisfaction**

Employee satisfaction is a function of perceived performance and expectations. It is person's feeling of pleasure or disappointment resulting of comparing a products outcome to his/her expectations. If the performance falls short of expectations, the employee is dissatisfied and if it matches the expectations, the employee is satisfied.

- Job satisfaction is defined as "a pleasurable or positive emotional state resulting from the appraisal of one's job or job experience"
- "Job satisfaction is defined as the amount of overall positive effect (or feelings) that individuals have towards their jobs"
- "Job satisfaction is the amount of pleasure or contentment



associated with a job. If you like your job intensely you will experience high job satisfaction.

- If you dislike your job intensely, you will experience job dissatisfaction"
- Job satisfaction is the favorableness or unfavourableness with which employees view their work.
- Job satisfaction can be measured based on morale. option. attitude. Work climate, and quality of work life.

### **1.3 Dimensions of Job Satisfaction :**

There are three important dimensions to job satisfaction:

- 1) Job satisfaction refers to one's feeling towards one's job. It can only be inferred but not seen.
- 2) Job satisfaction is often determined by how well out-comes meet or exceeds expectations. Satisfactions in one's job means increased commitment in the fulfillment of formal requirements. There is greater willingness to invest personal energy and time in job performance.
- 3) The terms of job satisfaction and job attitudes are typically used interchangeably. Both refer to effective orientations on the part of individuals towards their work roles which they are presently occupying, Positive attitudes towards the job are conceptually equipment to job satisfaction and negative attitudes towards the job dissatisfaction.

### **1.4 Factors of Determining Job Satisfaction :**

There are number of factors which effect job satisfaction. Value system possessed by an individual and the culture supporting the value system in the organization can be called an important and basic for job

# QUESTIONNAIRE FOR JOB SATISFACTION



## Part A : Basic Information

- 1) Name of the employee : \_\_\_\_\_
- 2) Designation : \_\_\_\_\_
- 3) Sex : \_\_\_\_\_
- 4) Qualification : \_\_\_\_\_
- 5) Experience : \_\_\_\_\_

## Part B : Core Questions

- 1) Since how many years have you been working with organization
  - a) 0 – 2 years
  - b) 2 – 4 years
  - c) More than 4 years.
  
- 2) How is the working environment ?
  - a) Participative
  - b) Autonomy
  - c) Whimsical
  - d) Red tapism
  
- 3) Do you think your work is according to your qualification and skills ?
  - a) Yes
  - b) No



Are you satisfaction with the top management?

- a) Yes
- b) No



5) Are you satisfied with the working hours at organization ?

- a) Yes
- b) No

6) Does the employee share experience to help each other ?

- a) Yes
- b) No

7) Do you appreciation if the desired work / targets are accomplished?

- a) Yes
- b) No

8) Do you think there are good career prospect in your organization ?

- a) Yes
- b) No

9) How is the physical working condition in the organization ?

- a) Yes
- b) No

10) Does the top management involve employees in the management decisions ?

- a) Yes
- b) No



- 11) Does the organization provide medical facility for employees ?
- a) Yes
  - b) No
- 12) Which of the following factors which motivates you most ?
- a) Salary
  - b) Promotion
  - c) Leave
  - d) Recognition
- 13) Does your organization recognize and acknowledge your work ?
- a) Strongly Agree
  - b) Agree
  - c) Neutral
  - d) Disagree
  - e) Strongly disagree
- 14) Does the organization provide satisfactory salary according to your work ?
- a) Yes
  - b) No
- 15) Your overall satisfaction as an employee of organization ?
- a) Highly satisfied
  - b) Satisfied
  - c) Average
  - d) dissatisfied



**M.A. THESIS**

**MS. RUPALI  
DATTATRAYA  
DIXIT**

**NOVEMBER**

**2023**

**“DEPRESSION AND ANXIETY  
IN PEOPLE LIVING WITH HIV  
IN JALGAON DISTRICT ”**

**A THESIS SUBMITTED TO  
SAVITRIBAIPHULEPUNEUNIVERSITY**

**FORAWARDOFDEGREEOFMASTEROF  
ARTS(M.A.)**

**INTHEFACULTYOFHUMANITIES**

**SUBMITTEDBY  
MS. RUPALI DATTATRAYA DIXIT**

**UNDERTHEGUIDANCEOF**

**DR. SHRADHA RARAVIRKAR**

**MARATHA VIDYA PRASARAK SAMAJ'S**

**SHRIMATI VIMLABEN KHIMJI**

**TEJOOKAYA ARTS, SCIENCE &**

**COMMERCE COLLEGE**

**DEOLALI CAMP, NASHIK**

**NOVEMBER 2023**

## **Certificate of the Guide**

Certified that the work incorporated  
in the dissertation/thesis **DEPRESSION AND ANXIETY IN PEOPLE  
LIVING WITH HIV IN JALGAON DISTRICT** submitted by  
**Ms. RUPALI DATTRAYA DIXIT** was carried out by the  
candidate under my supervision/guidance. Such material has been obtained from  
mother sources and has been duly acknowledged in the dissertation/thesis.

Date: 15/11/2023

Dr Shradha Raravikar  
HOD, of Psychology  
Department  
SVKT College, Deolali Camp,  
Nashik

## **Declaration by the Candidate**

I hereby declare that this thesis **DEPRESSION AND ANXIETY IN PEOPLE LIVING WITH HIV IN JALGAON DISTRICT** submitted by me for the degree of Master of Arts is based on actual work carried out by me under the guidance of **Dr. Shradha Raravikar**. Any reference to work done by any other person or institution or my material obtained from other sources have been duly cited and referenced. It is further to state that this and has not formed the basis for the award of any degree, diploma, associateship, fellowship, titles in this or any other University or other institution of Higher learning.

I further declare that the material obtained from other sources has been duly acknowledged in the dissertation.

Date: 15/11/2023

Ms. Rupali Dattraya Dixit  
MA II year Student  
SVKT College,  
Deolali Camp, Nashik

## **ACKNOWLEDGEMENT**

I would like to special thanks of my professor Department of Psychology HOD Dr. Shradha Raravirkar the college of VimalabenKhimjiTejookaya Arts, Commerce and Science Collage Deolali camp Nashik that, their great support and guidance and gave me the great opportunity to submitting this project report as **Depression and anxiety in people living with HIV in Jalgaon District** .

This is my gratitude to those people who help me during my work. I would like to thanks to my all teacher who guide me in my project work.

I would like thank District program AIDS control Unit, Jalgaon who gave me the permission for serve. Last but not the least I also thanks to my friends and family member their great support to me in my research project.

Date: 15/11/2023

Ms. Rupali Dattraya Dixit  
MA II year Student  
SVKT College, Deolali  
Camp, Nashik

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## Abstract

Anxiety and depression are significant issues for people living with HIV. The aim of this study was to investigate the relationship between depression and anxiety in individuals living with HIV in the Jalgaon district. In this correlation study, we aim to describe how HIV-related issues contribute to the increase in anxiety and depression among people living with HIV. A purposive sample of 30 individuals (15 males, 15 females) living with HIV was chosen for the study. The anxiety scale, consisting of four measures, and the Automatic Thought Questionnaire were used to assess depression and anxiety.” The positive relationship between depression and anxiety in people living with HIV. The new diagnosis HIV infection people living with HIV both gender is statistically analysis revealed that anxiety and depression are positively correlated of ( $r=0.41$ ). The analysis shows that the depression shows in people living with HIV is 0.41, while the anxiety shows 0.81 In anxiety there are four system count such as feeling, cognitive, behavioral, and somatic symptoms The feeling symptoms is not seen in people living with HIV, while the cognitive is 0.66, behavioral 0.37 and somatic is 0.50 irrespectively. Thus, it is seen that many newly diagnosed people living with HIV often experience anxiety and depression. It is concluded that the anxiety and depression is associated with HIV. It is also observed that most of newly diagnosed PLHIV were emotionally disturbed, and were not in a condition to respond to researcher’s questions.

The study is carried out on a limited sample size. So, the caution should be taken while generalizing. Also, the research does not explore the gender differences in anxiety and depression.

It is seen that each health care center needs to provide facility to assess the level of anxiety and depression of people living with HIV, in every six months. That will improve the adherence of anti-retro viral treatment and improve their health.

## **Introduction**

Human Immunodeficiency Virus is a virus that attacks the immune system of the human body. This virus first attacks the CD 4 cell, T cell, the types of white blood cells. CD 4 is our immune system that fights against infection. The Virus attack on the human immune system CD4 T cell. HIV destroys our immune system CD4 Cell and disturbs the ability of B cells to make antibodies, making it very difficult for the body to fight against various infections and diseases. The HIV virus is transmitted through unprotected sexual contact, blood, and other body fluids and from mother to child during pregnancy, during delivery and during breastfeeding. For example, in the person who is not HIV infected but in our daily life when his or her immune system decreases suffering under some viral infection. (Singh et al.,2022)

Camara et al. (2018) state that depression or anxiety are the significant issues that affect many people and can lead to disability. It is always linked to the diagnosis of chronic diseases, which can cause feelings of sadness and anxiety. Depression itself is marked by symptoms such as feeling down, having less energy, changes in sleep and appetite, losing interest in things you used to enjoy and struggling with negative thoughts and concentration (Fleischmann & de Leo, 2014). According to WHO 350 million suffer from depression. Depression is experienced by most people in their life due to failure in their work. Children also face depression when they fail to achieve their school task. Some people in medical condition experience the depression such as HIV and cancer (Smith, 2014)

According to DSM 5, anxiety disorders are like a bunch of mental health issues where people get super worried and scared about stuff. Fear is when you are freaked out by something happening, like a real threat. Picture this: heart racing, sweaty palms – that is fear in action. It is all tied to thoughts of imminent danger, and sometimes it makes you want to bolt away from the scary thing, whether it is a situation or an object, like blood or heights. Now, anxiety is a bit different. It is like this ongoing worry about bad stuff that might happen in the future. You are all tense and on edge, muscles wound up like a spring. People dealing with anxiety are always on the lookout for something bad to go down. They might get super cautious or start avoiding certain situations, like big crowds or train stations. And there are different types of anxiety disorders, each messing with your life in its own special way. They are basically different flavors of how fear and worry mess with a person. It is like



your mind is playing tricks on you, making everything seem scarier than it really is.

ICD 11 defines anxiety and fear-related disorders as conditions where people experience an overwhelming amount of fear or anxiety, leading to behaviors that can disrupt their daily lives. The symptoms are so intense that they cause significant distress and can make it challenging for individuals to function well in various aspects of their lives, such as personal relationships, family, social activities, education, work, and other important areas.

Camera et al., (2018) state that it is important to know that there is correlation between Human Immunodeficiency Virus and mental health issues like anxiety and depression. More than half of people with HIV/Aids face the mental disorder and they often face depression and anxiety. These mental health issues are more common among people with HIV/Aids than in the general population. So not just physical aspects of the disease shall be addressed but also the emotional well being of those affected by it. Most of the HIV infected patients face anxiety and depression because of ART Adherences, Viral load and leading with opportunistic infection, stigma and discrimination among the society and family members (Charlson, 2016).

As of the end of 2022, the World Health Organization reported that 39.0 million people worldwide were living with HIV. In India, the prevalence of HIV among adults aged 15 to 49 has been on a decline since the year 2000. Specifically, the prevalence rate dropped from 0.55 percent in 2000 to 0.32 percent in 2010 and further decreased to 0.21 percent in 2021. Notably, the northeastern states in India have the highest number of HIV cases, estimated at 24 lakhs. Among these, the three states with the highest prevalence rates are Maharashtra, Andhra Pradesh, and Karnataka. Despite overall progress, certain regions and states in India still face significant challenges in dealing with HIV, as highlighted in the National AIDS Control Organization (NACO) report of 2021 (NACO, 2021).

In India the HIV prevalence rate among adults in 2021 was 0.21 percent. For male, it was 0.22 percent and for females it was 1.9 percent. In India about 3.94 lakhs people were living with HIV/AIDs in 2021 and Maharashtra had the highest number of people living with HIV in India. It is the top-ranking state for people living with HIV AIDs (NACO& ICMR & NIMS, 2021).

Camara et al.,(2018)discuss that People who experience significant anxiety and depression might be more vulnerable to contracting HIV. They have weakened

immune systems, difficulty in sticking to their treatment plans, higher level health care expenses, experience a disability and face a higher risk of premature death. If they are not good Antiretroviral Treatment adherence they face many health issues and a decreased immune system (Nacher, 2010 & Garey, 2015). When someone receives a diagnosis of being HIV positive it can bring about a feeling of anxiety and depression. These emotional struggles can lead to vulnerable sexual behavior, which can increase the risk of spreading the HIV virus to others. Furthermore, studies have found that people who experience depression are less likely to follow through with their mental health treatment and stick to their prescribed medication for Anti Retroviral Therapy. The importance of providing support and care for those dealing with HIV not only for their physical health but also their mental wellbeing (Nanni, 2014). The fifty percent people living with HIV also experience depression who have not been officially diagnosed with depression (Asech, 2003)

The DSM 5 provides guidelines for diagnosing and managing psychiatric and major & mild neurocognitive disorder in the context of HIV clinical setting. When dealing with these individuals, health care professionals can refer to these guidelines to assess and treat conditions like depression anxiety or cognitive impairment related to HIV.

The study in India found that 45 percent of people living with HIV had experienced some form of psychiatric illness at some point in their lives. It means half of the individuals in the study having HIV had face mental health challenges (Singh et al., 2022)

The District AIDS Program Control Unit, Jalgaon Provide information on the position of HIV in Jalgaon Maharashtra. It is a middle-income district with a history that resulted in socio-economic class division. Predominantly, most of the people are farmers. Geographically, Jalgaon district is bordered by Madhya Pradesh on one side and Gujarat border on other side, so the migration rate is high. There are not many industries so people are farming or are self-employed. Most of the people are migrated to Gujarat State for jobs and thus increase the risk of HIV because they live away from their families. Around 15000 people in Jalgaon district are HIV Positive and undergoing Anti Retroviral Treatment. The Prevalence of heterosexual intercourse is high and hence HIV Positivity is also high.

The current study aims to find the Depression and Anxiety in People Living with HIV in Jalgaon District.

## **Constructs**

### **1. Anxiety**

“Anxiety is a negative mood state characterized by bodily symptoms of physical tension and by apprehension about the future” (Barlow et al., 2018).

Butcher et al., (2017) define anxiety in their book *Abnormal Psychology* as “In contrast to fear and panic, the anxiety response pattern is a complex blend of unpleasant emotions and cognitions that is both more oriented to the future and much more diffuse than fear.”

“At a behavioral level, anxiety may create a strong tendency to avoid situations where danger might be encountered, but there is not the immediate behavioral urge to flee with anxiety as there is with fear” (Barlow, 1988).

### **Type of Anxiety Disorder**

All Anxiety disorders have unrealistic, irrational fears or anxieties of disabling intensity as their principal symptom. Most obvious manifestation among the disorders recognized in ICD 11 are:

**A. Specific phobia-** A specific phobia is when a person experiences strong and ongoing fear when they trigger a specific object and situation. This fear can be so intense that it leads them to avoid everyday situations. Some examples of specific phobia include being afraid of animals like snakes, dogs, having a fear of blood, fearing flying, heights or even getting injections.

**B. Social anxiety disorder (social phobia)-** Social anxiety disorders means that a person feels over and overwhelming fear of nervousness in social situation, like talking to others or being in group of people. This fear happens regularly and can make social interaction very difficult and uncomfortable for them such as public speaking, urinating in a public bathroom, or eating or writing in public. People with social phobias either avoid these situations or endure them with great distress. Indeed, people with the more general subtype of social phobia often have significant fears of most social situations. They are too much worried about the social situation.

**C. Panic disorder-** panic disorder means having sudden, intense fear episodes called panic attacks. These attacks come without warning and bring with various symptoms like racing heart, sweating, trembling, and a strong sense of fear. What makes it a disorder is not just the panic attacks themselves, but the constant worry about when they might happen again and the actions people take to prevent them. This worry and avoidance can disrupt their life in personal, family, social, work, and education areas. It is important to note that these symptoms are not caused by other health issues or drugs affecting the brain. If you know you are afraid of high places or of driving over long bridges, you might have a panic attack in these situations but not anywhere else this is an expected panic attack. By contrast you might experience unexpected panic attacks if you do not have a clue when or where the next attack will occur. Unexpected attacks are important in panic disorder.

**D. Agoraphobia-** Agoraphobia is a condition where someone experiences extreme fear or anxiety in various situations. These situations are ones where it might be tough to escape or get help, like using public transportation, being in crowded places, or going outside alone such as shopping or going to the theater. People with agoraphobia are often very worried about specific bad things happening, like having a panic attack or embarrassing physical symptoms. Because of this fear, they tend to avoid these situations, only go into them when they have someone, they trust with them, or they endure them with intense fear or anxiety. These symptoms last for at least several months and are serious enough to cause significant distress and problems in their personal, family, social, educational, or work life. Standing line can be physically difficult.

**E. Generalized anxiety disorder-** Generalized anxiety disorder in which stands for Generalized Anxiety Disorder, is when you feel very anxious and worried a lot, even when there no specific reason to be anxious. You might find yourself worrying about different things like your health, job, school, or relationships most days, and it can feel like one worry leads to another. On top of that, you might experience physical symptoms like feeling restless,

having trouble focusing, and struggling to sleep. It is like your mind is always racing with worry, and it can make it hard to relax and feel at ease. It explains that generalized anxiety disorder is a condition where people experience intense anxiety symptoms for an extended period, often lasting for several months and happening frequently. These symptoms can be a general sense of unease or excessive worry about everyday things like family, health, money, or work/school. People with this disorder may also have physical symptoms like muscle tension, restlessness, and heightened stress responses. These symptoms can be very distressing and affect various aspects of their life, such as personal relationships, social interactions, work, and more. Importantly, these symptoms are not caused by other medical conditions or the use of substances or medications that affect the nervous system.

**F. Separation anxiety disorder-** Separation anxiety disorder is when kids get really worried about their parents or people they care about. They are afraid that something bad might happen, like getting lost or hurt, and that they will be taken away from their loved ones. Because of these fears, they do not want to go to school or leave their home not because they dislike school but because they do not want to be away from their family. They might not want to sleep alone and have nightmares about being apart from the people they love. This can also cause physical symptoms and make them feel very stressed and anxious. It is a tough thing for them to deal with.

**G. Selective mutism-** Selective mutism is a rare childhood condition where a child does not talk in situations where talking is expected. It is not because they do not know how to speak or have any physical problems. And it is not related to other conditions like autism, which might affect speech. In selective mutism the child can speak in some places, like at home, but not in others, like at school. This is why it is called selective. It is often linked to social anxiety because the child can speak but they choose not to in certain situations.

## **Symptoms Of Anxiety**

The symptoms of the anxiety described by (Holland, 2018) and talk works organization explain the symptoms of anxiety these are as follows-

### **Physical symptoms:** -

- Increase in heart rate
- Rapid breathing
- Muscle tension
- Sleeping problem
- Avoiding activities people or places
- Dry mouth
- Blurred vision

### **Psychological symptoms**

- Excessive worry or apprehension
- Difficult in concentration
- Feeling rest less
- Reoccurring or intrusive thoughts
- Worry that is difficult to control

## **2. Depression**

According to the ICD 11, Depressive disorders are a type of mental health issue where a person consistently feels extremely sad, irritable, or empty. Along with these emotions, they also experience various other symptoms that affect how they think, behave, and even about their physical well-being. These symptoms can make it challenging for them to carry out their daily activities. It is crucial to understand that if someone has ever had episodes of intense and often unusual mood, like manic, mixed, or hypomanic episodes, they would not be diagnosed with a depressive disorder. Instead, this could suggest a different condition known as bipolar disorder. In bipolar disorder, individuals go through extreme mood swings, alternating between periods of deep depression and high energy levels.

Mental health professionals use DSM-5, a manual to classify various types of depressive disorders. One common type is Major Depressive Disorder, characterized by episodes of deep sadness, changes in thinking, and physical symptoms lasting at least two weeks. These episodes are separated by periods of feeling better. Other

types include disruptive mood dysregulation disorder, persistent depressive disorder (or dysthymia), premenstrual dysphoric disorder, and depression caused by substances or medical conditions. These categories help professionals diagnose and understand different forms of depression.

### **Type of Depression**

**A. Disruptive mood dysregulation disorder-** Disruptive Mood Dysregulation Disorder (DMDD) is a condition in kids where they are consistently irritable and frequently exhibit serious behavioral issues. It is now classified as a type of depressive disorder for children up to age 12. Research indicates that children with this pattern are more prone to developing conditions such as depression or anxiety as they grow older, rather than bipolar disorder. In simpler terms, it is considered a depressive disorder because it often leads to depression and anxiety in teenagers and adults who had this condition as children.

**B. Major depressive disorder-** Major Depressive Disorder (MDD) is a prevalent mental health condition characterized by prolonged periods of intense sadness, accompanied by changes in thinking patterns and disruptions in physical and emotional well-being. These episodes typically last at least two weeks and may recur throughout an individual's life. Distinguishing MDD from normal feelings of sadness or grief is crucial. Grief, a natural response to loss, usually does not progress to major depressive disorder. However, when both coexist, depression symptoms are generally more severe. People who develop depression after a loss often have additional vulnerability factors. Diagnosing MDD is essential for appropriate treatment, and antidepressant medications can be beneficial in the recovery process. Persistent Depressive Disorder is a more prolonged and ongoing form of depression that persists over an extended period. In summary, recognizing and addressing MDD, distinguishing it from grief, and understanding related conditions like persistent depressive disorder are crucial for effective treatment and support.

**C. Persistent depressive disorder (dysthymia)-** Persistent Depressive Disorder (PDD), introduced in the DSM-5, is characterized by a prolonged and

enduring low mood that significantly impacts daily life. In adults, it requires persisting for at least 2 years to be diagnosed, while for children, the duration is at least 1 year. Unlike other types of depression, PDD may not be as intense but is chronic, making it a long-term condition affecting mental well-being

**D. Premenstrual dysphoric disorder-** In simpler terms, the DSM-IV, a guide for identifying mental health issues, initially did not give much attention to Premenstrual Dysphoric Disorder (PMDD), suggesting it needed more research. However, in the newer DSM-5, PMDD got a more prominent spot. This change occurred because over almost two decades, more studies demonstrated that PMDD is a distinct kind of depression happening after ovulation and getting better just before menstruation. It can seriously impact a person's daily life, but the positive news is that it responds well to treatment.

**E. Substance/medication-induced depressive disorder-** Sometimes, feeling down can be caused by things like using drugs, taking certain medicines, or having other health problems. In mental health, we have names for these situations, like "substance/medication-induced depressive disorder" (when it is linked to drugs or meds) and "depressive disorder due to another medical condition" (when it is because of other health issues). These terms help us understand that what seems like depression might have different causes.

**F. Depressive disorder due to another medical condition-** This describes a situation where someone is going through a prolonged period of intense sadness or lack of interest in most things. The root cause of this mood issue is primarily a medical condition, and there is clear evidence from the person's medical history, physical examination, or lab tests that establishes the connection between the medical condition and the mood disturbance. In simpler terms, the person's low mood is directly related to a specific health problem.



### **G. Other specified depressive disorder, and unspecified depressive disorder-**

This is talking about a scenario where someone shows signs of being down or sad during presentations. These feelings are making their life harder, but when experts look at the specific things bothering them, it does not perfectly fit the definition of a particular type of feeling down (depressive disorder). In the world of psychology, they use the term "other specified depressive disorder" when a therapist wants to explain why the person's feelings do not exactly match the usual patterns seen in depressive disorders

### **Symptoms of the Depression**

The symptoms of depression in DSM 5, these symptoms depend on the time, duration, or presumed etiology. The symptoms areas follow-

- presence of sad
- empty
- irritable mood,
- feeling worth less
- accompanied by somatic and cognitive changes

### **Anxiety and HIV**

Sharing HIV positive status with others can have several positive outcomes. When you disclose your HIV status to your sexual partners, it can lead to safer sexual practices, including better condom use and negotiation. It can also encourage your partners to get tested for HIV. Additionally, sharing your status with others can help you stay engaged in medical care and improve your adherence to antiretroviral treatment (ART). This is because you may receive specific support related to disclosure, and you do not need to hide your medication. Moreover, there can be psychological benefits to disclosure, such as increased well-being through greater social support, more positive ways of dealing with HIV-related stress, and boosted self-esteem. Disclosure might also reduce anxiety, although the evidence on this is mixed. If you do not disclose your report above all these situations lead to increased anxiety in patients. But patients are afraid about disclosing their HIV status because of

discrimination from others family members, health care workers, society, and others (Evangelini & Wroe, 2017).

### **Depression And HIV**

This becomes even more important when we think about how often people with clinical depression also have HIV infection, and how this can make both conditions worse and affect the way they progress. In other words, when someone has both clinical depression and HIV, it can make their health problems more challenging and have a negative impact on how they experience these illnesses.

The connection between clinical depression and HIV is quite complex. Depression can play a role in increasing the risk of HIV infection, making it easier for the virus to spread. It can also be a result of having HIV. There are several factors that can lead to clinical depression in people living with HIV. These include changes in the brain due to the virus being present in the central nervous system, feelings of isolation and shame due to societal stigma and sexual problems, dealing with the fear of being sick and facing mortality, experiencing side effects from the medications used to treat HIV, and having other medical conditions alongside HIV (Nanni et al., 2014)

### **Rationale and Significance of the Study**

While working with people living with HIV, researcher had experience that when people newly get diagnosis, they face many mental health conditions such as anxiety and depression. This condition mostly associated with disclosure of his or her HIV status to the spouse. The view of other society member, friends, and family member and what they think about himself or herself become a matter of concern. Mostly this condition arises when couple are discordant. Also, the people living with HIV have fear of stigma and discrimination from family, society, friends, and health care center. These conditions increase vulnerability of anxiety and depression in people living with HIV. So, considering the experience, the researcher selected this topic for study.

## **Statement of Problem**

Considering the significant number of patients living with HIV and their suffering, the researcher wants to examine the relation of anxiety and depression with HIV people living with HIV in Jalgaon district.

## **Review of literature**

Literature review is conducted to help build and strengthen the knowledge of the topic of research. It is done for understanding important concepts, research methods and experimental techniques that are used pertaining to the area of study and to see to it the same is not repeated but includes some innovation. This gives insights into how researchers apply the concepts to real problems. The previous research related to the current study is reviewed here.

Morrison et al.,(2011) have described that many people who have been diagnosed with HIV are experiencing mental health issues at a significant rate. Many of them are dealing with anxiety and depression and some are even facing both conditions at the same time. This indicates a clear need for more mental health support and care for individuals who are living with HIV in Albania. The sample of 79 People living with HIV were interviewed with semi-structured interview, the self report histories of mental health diagnoses as well as the medical record were seen. The options are given to patients such as depression, anxiety, dementia, bipolar disorder or other and again the answer was multiple choice format. The high levels of anxiety and depression were reported at 62.3 percent and 82.3 percent respectively. Most of the patients stated that their emotional health was good, with only 11.4 percent reporting it as poor. They also mentioned that their emotional condition had improved due to antiretroviral treatment. The score indicates the correlation between Anxiety, Depression and HIV.

Camara et al. (2018) have shown that the anxiety and depression were increased in People living with HIV who are under treatment. So, to manage these anxiety and depression symptoms with comprehensive integration and care to People living with HIV, they develop guidelines for treating anxiety and depression among people living with HIV. The total study population sample was (n=600) and the target sample size was (n=160) who are to follow up between the period of 3 months of data collection. The formula was used to determine the sample size based on the single population proportion formula. The age group was 18 years old both males and

females. The data was collected through an interviewer administered questionnaire. The institutional based cross-sectional study was conducted. Most of the study participants were female (118/160; 73.8percent). In this study out of 160 HIV patients, approximately 22 of them (which is around 13.8percent) reported having symptoms of anxiety. Additionally, about 27 of the 160 HIV patients (around 16.9percent) reported experiencing symptoms of depression. When looking at the combination of depression and anxiety, roughly 36 out of the 160 patients (around 22.5percent) reported experiencing either depression or anxiety. The confidence interval for this co-occurrence is estimated to be between 16.3percent and 29.4percent. Lastly, the study found that 8.1percent of the HIV patients had both depression and anxiety at the same time. The score indicates that some patients have only depression, some have only anxiety and a few patients reported having both. It indicates that depression and anxiety increase in People living with HIV.

Aika&Odili (2019) showed that many people living with HIV often experience depression and anxiety. These feelings are more common in HIV patients who are not in a relationship, those who have recently been diagnosed, and those who use alcohol. Additionally, individuals with HIV who have a condition called generalized anxiety disorder are more likely to develop depression. The cross-sectional study suggests that it is important to include mental health care as part of HIV treatment. By regularly checking and screening patients for symptoms of depression and anxiety, we can help prevent these issues, diagnose them early, and provide the necessary treatment for those who are experiencing depression. The sample size recruited 305 newlydiagnosed people living with HIV. Age group was 18 years Excluding the criteria from the study was HIV positive pregnant women and tuberculosis patients. Convenience sampling was used. The study gathered information about the people involved, specifically details about their age, gender, employment status, income, marital situation, how long they have been diagnosed with HIV, their use of alcohol and cigarettes, any other chronic illnesses they may have, and any adverse effects they might have experienced. In the second section, they used a questionnaire called the Patient Health Questionnaire (PHQ-9) to evaluate any signs of depression the participants may have experienced in the past two weeks. They considered a score of 5 or higher as an indicator of potential depression and a score of 10 or higher as a sign of major depressive disorder or clinically significant depression. In the third section, they used the Generalized Anxiety Disorder scale

(GAD-7) to assess anxiety among the participants. A score of 5 or more on this scale was used to identify potential generalized anxiety in the study. Both the depression and anxiety assessments focused on the two weeks leading up to when the participants were recruited for the study. The mean score was (PHQ-9)3.1=4.0 with Cronbach 0.803 showing the depressive symptoms. 75 percent of the respondents showed depressive symptoms ranging from mild to severe. The score represents that the prevalence of depressive symptoms shown in patients and anxiety was strongly associated with depression.

Yousuf et al. (2020) found that 32.5percent of HIV-positive women experienced depression, especially those who were illiterate, divorced, unemployed, or facing financial issues. Low CD4 counts and other infections were linked to higher depression risk. Out of 357 women, 28.9percent had anxiety. Depression severity was categorized as mild, moderate, or severe, with factors like low education, divorce, unemployment, and income below \$36.5 being significantly associated. CD4 counts below 250 and co-infections also correlated with depression. The key takeaway is the importance of addressing mental health alongside physical health in HIV-positive women, emphasizing the need for a comprehensive healthcare approach. Prioritizing both mental and physical well-being is crucial for an effective and inclusive healthcare system, particularly for conditions like HIV.

Alama et al.(2020) found high level of anxiety and depression in HIV positive people. The study found that the anti retro viral therapy sometime associated with mental issuesin HIV positive people. The period of study was 6 months. The sample Size of 220, who were having HIV. The age range was 18 to 75. Many different tools were used in study likeHamilton Depression Scale and Hospital anxiety and depression scale. Hamilton Depression Scale consist 17multiple choice question. The hospitalized scale providesanxiety (A-score) and depression (D-score). Also,SpielbergerInventory was used for self-assessment of anxiety. Hamilton Depression Scale found 95.45 percent of HIV positive people had some level depression. The 158 were found moderate and severe depression. Inthat 56 were men and 102 were female. The hospitalized anxiety and depression scale found 92.27percent of HIV positive people found degree of depressive symptoms and while the anxiety symptoms 91.82percent in that more anxious were female. The Spielberger Inventory for self-assessment anxiety symptoms were not associated with weight (p-values of 0.63 and 0.37, respectively). There is no strong correlation

between symptoms of anxiety and gender ( $p = 0.0039$ ). In other words, the study showed that anxiety symptoms were more prevalent in certain gender groups and were more intense in individuals with higher viral loads. The score indicated that there is a high prevalence of anxiety and depression in HIV Positive patients. The Score also indicated that the anxiety and depression is more likely high in female.

### **Objectives**

1. To study the relationship between depression and anxiety in people living with HIV

### **Hypothesis**

1. There is a correlation between anxiety and depression in people living with HIV.

### **Method**

#### **Sample**

- The Purposive sampling method was used to select the sample
- The 30 (M=15, F=15) PLHIV (People living with HIV) from Government Medical College and Hospital, Jalgaon were selected for the study
- Age Group- 30 yrs to 45 years
- Geographical area- Jalgaon District

#### **Variables**

- HIV
- Anxiety
- Depression

#### **Operational Definitions of Variables**

1. **HIV**- The HIV is operationally defined as the confirming the presence of HIV infection after a positive result on HIV test (Detect Antibody Immunoassays used by Comb Aids test (WHO, 1997)
2. **Anxiety**- The Anxiety is operationally defined as the scores of People living with HIV measured by the Four System Anxiety Questionnaire by Koksall & Power (1990)

3. **Depression-** The Depression is operationally defined as the scores of People living with HIV measured by the Automatic Thoughts Questionnaire by Hollon&Kendall's (1980)

### **Research Design and Procedure**

The correlational research was conducted on a purposive sample of 30 adult HIV clients (M=15, F=15) who were newly detected for HIV at the ICTC & ART Department, Government medical college and Hospital, Jalgaon, including both IPD & OPD clients. Their financial condition, educational and professional background were varied.

The study was conducted over two months. The data was collected by the investigator from 15 male and 15 female living with HIV from ICTC and ART Department Government medical college and Hospital Jalgaon. The PLHIV were to solve 2 scales. The time taken to solve the test and the total score was noted by the investigator.

Many of them were suffering under opportunistic infection and HIV AIDS symptoms and illness. The explanation of the theme of research and tools was given to them.

The statistical analysis was done after scoring the psychological tests.

### **Tools-**

#### **1. Diagnosis HIV Test**

The Rapid test was use for HIV testing. As per guideline there are three tests were use if the patient positive in first test for conformation. The first test is Comb Aids, second is Bio line and third is Tri Dot. All these tests are reliable and valid. The time for each test taken 20 to 25 minutes.

2. **The four-system anxiety questionnaire-**The sixty-item self-report questionnaire, known as the Four System Anxiety Questionnaire, is designed to measure four components of anxiety: somatic, cognitive, behavioral, and emotional. In each question, respondents are asked how often they have felt a certain way, and they must respond with either "Yes" or "No." Each item is assigned a scale value, and the score is calculated for the four subscales by adding up the values only for those items to which the respondents responded with a "Yes." The score values indicate the level of anxiety. If the scores are



higher for the emotional and cognitive components, modifying one's cognition is likely to be helpful. If the score is highest in the somatic component, relaxation techniques can be very useful. If the highest score is in the behavioral component, the person may be avoiding situations that make them feel anxious.

The split half reliability coefficient and confidence intervals of the  $r$  of the questionnaire as a whole and for each of the four components were calculated by university students and anxiety patient ( $n=272$ ):  $r=.82(.76,.86)$  for the feeling component,  $r=.81(.72, .86)$  for the cognitive component,  $r=.68 (.59,.74)$  for the behavioral component,  $r=.68(.59,.74)$  for the somatic component,  $r=.92(.89,.94)$  for the questionnaire as a whole. Because the confidence intervals were assessed using a statistical table (Neave, 1978), results indicate the feeling and cognitive component of the FSAQ are more reliable than the behavioral and somatic components.

### **3. The automatic thought questionnaire-**

Hollon & Kendall (1980) developed the Automatic thought questionnaire. The 30-item questionnaire measuring depression used a 5-point scale for collecting responses. Respondents shall respond on the given item on the scale from 1 (Not at all) to 5 (All the time) find the score simply add together the respondents' responses for the 30 items. The lowest score 38 and the highest score 60 and given the percentage lowest is 15 and highest is 85. The highest score indicates that changing the respondents' automatic thought could feel considerably better.

The reliability of the ATQ-30: split-half reliability and coefficient alpha (a measure of internal consistency). The results showed that, when considering all three criterion groups together and the entire sample, the ATQ-30 exhibited very high reliability. The split-half reliability was 0.96, and the coefficient alpha was 0.98, indicating that the tool is dependable for this clinical population. The ATQ-30 demonstrated high reliability, suggesting it is a reliable tool for assessing cognitive styles in these groups. However, for a subgroup of non-depressed individuals with other mental health issues (psychopathology), the split-half reliability was lower at 0.59, indicating that the ATQ-30 may be less consistent for this group. The ATQ-30 were significantly related to the total score, with correlations ranging from 0.56 to

0.91. This means that the items effectively measured the same underlying concept consistently across different groups.

## **Result**

The r value of .41 indicates that there is a positive correlation between anxiety and depression in people living with HIV.

## **Discussion**

The hypothesis of positive correlation between anxiety and depression in people living with HIV. The new diagnosis HIV infection people living with HIV both gender is statistically analysis revealed that anxiety and depression are positively correlated of ( $r=0.41$ ). The depression shows in people living with HIV is 0.41, while the anxiety shows 0.81 In anxiety there are four system count such as feeling, cognitive, behavioral, and somatic symptoms The feeling symptoms is not seen in people living with HIV, while the cognitive is 0.66,behavioral 0.37 and somatic is 0.50 irrespectively. It is also observed that most of newly diagnosed PLHIV were emotionally disturbed, and were not in a condition to respond to researcher's questions.

The study is carried out on a limited sample size. So, the caution should be taken while generalizing. Also, the research does not explore the gender differences in anxiety and depression.

It is seen that each health care center needs to provide facility to assess the level of anxiety and depression of people living with HIV, in every six months. That will improve the adherence of anti-retro viral treatment and improve their health

## **Conclusion**

Thus, it is seen that many newlydiagnosed people living with HIV often experience anxiety and depression. It is concluded that the anxiety and depression is associated with HIV.

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Maratha Vidya Prasarak's

S. V. K. T. ARTS COMMERS AND SCIENCE COLLAGE,  
DEOLALI CAMP.



University of Pune  
DEPARTMENT OF PHYSICS

## Certificate

This is to certify that **Mr. ADITYA BHARAT GADGIL** Of class B.Sc (Physics), has satisfactorily completed his project work as per rule laid down by the University of Pune entitled "**STUDY OF SOLAR POWER PLANT**" During academic year 2022-2023

*S.V.D.*  
05/05/23

Mr. S. V. Darade  
Project Guide

*P. Zate*  
5/5/23

EXAMINER

*P. Zate*  
05/05/23

*P. Zate*  
05/05/23

Prof. M. K. Zate

Head of Department

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Maratha Vidya Prasarak's  
S. V. K. T. ARTS COMMERS AND SCIENCE COLLAGE,  
DEOLALI CAMP.



University of Pune  
DEPARTMENT OF PHYSICS

## Certificate

This is to certify that **Mr. Shinde Chaitanya Ramesh** Of class B.Sc (Physics), has satisfactorily completed his project work as per rule laid down by the University of Pune entitled **STUDY OF MODERN METHODS OF WASTE MANAGEMENT**

During academic year 2022-2023

*Sirast*  
Mrs.Sonali S. Sirast  
Project Guide

*Shinde*  
EXAMINER  
*25/05/23*

*M.K.Zate*  
Prof.M.K.Zate  
Head of Department  
*25/05/2023*



## CERTIFICATE

*Nashik District Maratha Vidya Prasarak samaj's*

*S.V.K.T. Art ,Commerce And Science College,*

*Deolali Camp, Nashik-422401.*



### DEPARTMENT OF PHYSICS

This is to certify that Miss. **Mojad Mayuri Dhondiram** Of class B.sc (Physics), has satisfactorily completed his project work as per rule laid down by the University of Pune entitled "**VISCOSITY OF FLUIDS**" During academic year 2022-2023

*Prof. S.S. Sirsath*  
21/5/23  
Prof.S.S.Sirsath.

Project Guide

*Prof. M.K. Zate*  
3/5/23  
Prof. M.K. Zate.

Prof.M.K.Zate.

Head of Department

Examiner



**Maratha Vidya Prasarak**

**Smt. Vimlaben Khimji Tejookaya Arts, Commerce and Science College, Deolali  
Camp**



**University of Pune**

**Department of Physics**

**CERTIFICATE**

This is to certify that **Mr. Rajput Mayuresh Anil**  
Of Class B.Sc (Physics), has satisfactorily completed his project work as  
per rule laid

down by the University of Pune entitled

**"SOLAR CHARGER"**

During academic year 2022-2023

*S. Shirsat*  
Ms. Sonali Shirsat

*M. K. Zate*  
Prof. M. K. Zate

Project Guide

*S. Shirsat*  
*M. K. Zate*  
5/5/23 05/05/23  
Examiner

Head of Department

Year 2022-2023

Maratha Vidya Prasarak's

**S. V. K. T. ARTS COMMERS AND SCIENCE COLLAGE,  
DEOLALI CAMP.**

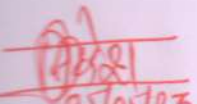


University of Pune

DEPARTMENT OF PHYSICS

## Certificate

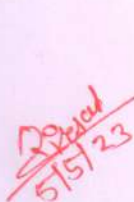
This is to certify that **Mr. Abhishek Ambadas Chougule**,  
Of class B.Sc (Physics), has satisfactorily completed  
his project work as per rule laid down by the  
University of Pune entitled **"STUDY OF Wind Energy**  
During academic year 2022-2023

  
Mr. S. V. Darade  
Project Guide

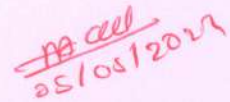
EXAMINER

Prof.M.K.Zate

Head of Department

  
5/5/23

  
05/05/2023

  
05/05/2023



**Maratha Vidya Prasarak's**

Shrimativimalaben khimji tejukaya  
art, commerce and science, deolali camp



University of Pune  
Dept of Physics

**Certificate**

This is to certify that Miss Bhoi Priyanka Sanjay  
Of class (Physics), has satisfactorily  
completed his project work as per rule laid  
down by the University of Pune entitled

During academic year 2022-2023

*Prof S.V. Darade*  
05/05/23  
**Prof S.V. Darade**

Project Guide

*Prof M.K. Zate*  
05/05/23  
**Prof M.K. Zate**

**Prof. M K zate**  
Head of Department

# Maratha Vidya Prasarak's

S.V.K.T. COLLEGE OF ARTS, COMMERCE AND SCIENCE,  
DEOLALI CAMP, NASHIK

UNIVERSITY OF PUNE


Department of Physics

Certificate

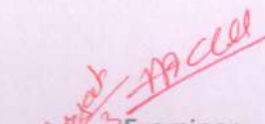



## Certificate

This is to certify that **Mr. Aher Narendra Dnyaneshwar** of class B.Sc. (Physics), has satisfactorily completed his project work as per rule laid down by the University of Pune entitled "**Fire Alarm System**" During academic year 2022-23

  
05/05/23  
Mr. S.V. Darade

(Project Guide)

  
5/5/23  
Examiner

  
Prof. M. K. Zate

(Head of Department)





## CERTIFICATE

*Nashik District Maratha Vidya Prasarak Samaj's*

### **S.V.K.T. Arts, Commerce and Science College**

Deolali Camp, Nashik-422401.

NAAC Accredited "A" Grade

#### **DEPARTMENT OF PHYSICS**

This is to certify that the project report "INVERTER 3.7V TO 220V" was completed by **Vidya Deepak Rajole** of B.sc (Physics) during the academic year 2022-2023 who carried our project work under my supervision.

*Sirsat*  
Miss. Sonali Sirsat mam

Project Guide

*Deepak*  
5/5/23  
Internal Examiner

*M.K. Zate*  
04/05/2023  
M. K. Zate Sir

Head of Department

*Deepak*  
05/05/23  
External Examiner

*Maratha Vidya Prasarak*

*Smt. Vimlaben Khimji Tejookaya Arts, Commerce and Science  
College, Deolali camp*



*University of Pune*

*Department of Physics*

*Certificate*

*This is to certify that **Miss. Dakhore Drushti Baban**  
Of class B.Sc. (physics) , has satisfactorily completed his project work as  
per rule laid down by the University of Pune entitled*

*“ Wireless audio transmitter and receiver”*

*During academic year 2022-2023*

*Mr.S.V.Darade*

*[Signature]*  
*03/05/23*  
*Project Guide*

*[Signature]*  
*05/05/2023*  
*Examiner*

*Prof.M.K.Zate*

*[Signature]*  
*05/05/2023*  
*Head of Department*





SEAT NO:

## CERTIFICATE

Nashik District Maratha Vidya Prasarak Samaj's

S.V.K.T. Arts, Commerce and Science College Deolali Camp,

Nashik-422401.

NAAC Accredited "A" Grade

DEPARTMENT OF PHYSICS

This is to certify that the project report "Automatic irrigation system" was completed by "MISS SONIYA SURESH CHAUDHARI" of B.Sc (PHYSICS) during the academic year 2022-23 who carried our project work under my supervision.

*M.K.Z*

Head.

Dept. Of Physics

*S.V.D*  
*05/05/23*

Examiner.

Project In charge

*S.V.D*  
*05/05/23*

Prof M.K.Zate

Prof S.V. Darade

# CERTIFICATE

This is to certified that Kale Vaishnavi Dnyaneshwar of class T.Y.BSC has successfully complete the project on the topic SOLAR FRUIT DRYER under the guidance Miss.S.S.Sirsat during the year 2022-23 in the partial fulfillment of the physics practical examination conducted by the Savitribai Phule Pune University.

~~Project~~  
Project Guide

Miss .S.S.Sirsat

~~Project~~  
5/5/23

Internal Examiner

~~Head of Department~~  
Head of Department

Mr.M.K.Zate

~~Head of Department~~  
8/5/23

External Examiner