Maratha Vidya Prasarak Samaj's

K.T.H.M. COLLEGE, NASHIK -2.

NAAC Reaccredited "A++" Grade with CGPA 3.79 "College with Potential for Excellence" By UGC Pune University "Best College Award-2017-2018"

Department: Electronics Science

Name: **Class: T.Y.B.Sc**

Roll No: **Date:**

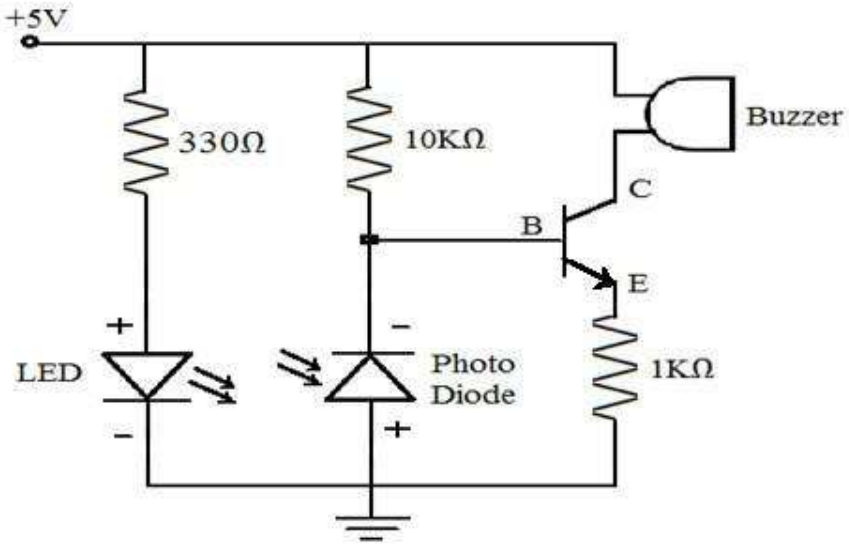
Remark:

Title: Design, develop and test optical sensors (LDR/Photodiode/Phototransistor)

Aim: To build & test optical sensors using LED and Photodiode

Components: Resistors 330Ω, 1kΩ, 10kΩ, LED, Photodiode, Transistor (BC107), Buzzer, wires, etc.

Circuit Diagram:



Theory:

The aim of this practical is to study a simple Burglar Alarm System that can detect an unauthorized entry. All the connections are made as per circuit diagram. The working of the circuit is as follows.

1) When there is no interrupt between the LED & Photodiode, then LED light falls on the surface of the photo diode. As it is connected in reverse bias mode, when the light falls on it, it conducts and

current flows through it. Since it is connected to the base of transistor, hence transistor is in cut-off region acts as a Switch (OFF State). As the buzzer is connected between Vcc and transistor, & alarm is OFF.

2) When there is an interrupt between the LED and photo diode, the light falling on the photo diode is interrupted and it doesn't conduct. As a result, the transistor goes into saturation region acts as a Switch (ON-State). This will trigger the buzzer and alarm is ON.

Photo Diode: A photo diode is a device that converts light signal to electrical current. It is basically a PN junction that operates in reverse bias condition. When light falls on the photo diode, a reverse bias current flow in the junction that is proportional to the luminescence of the light.

LED: A light emitting diode is a device converts electrical signal to light signal. It is basically a PN junction that operates in forward bias condition.

Optocoupler: It is an electronic component that transfers electrical signals between two isolated circuits by using light. An Optocoupler is also known as Opto-isolators.

Applications: A burglar alarm system is designed to detect an unauthorized entry into a house or area. Burglar alarm systems can be used in residential buildings, commercial buildings, offices, industries and even in military locations.

Observation table

Sr. No.	Interrupt	Voltage across photodiode	Alarm
1	Interrupt Present		
2	Interrupt Absent		

Result: Optical sensors using LED and Photodiode is studied.