A Project report on

3-WAY AUTOMATIC STREET LIGHT

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as CA-2 of ECE249: Basic Electrical and Electronics Engineering.

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Last date of submission of Project   : 22 April 2023

Check List before project submission	Yes/No
Are theoretical design and theory explained in report?	
Software testing done and snapshot of software testing are in the report.	
Is project component cost table available in report?	
Is hardware design working?	

Date of Project Demonstration and Presentation: _____

Name of the parameter	Marks Obtained				MM
Roll Number					
Report/Theoretical design					10
Software/ Hardware design					10
Understanding of Project					10
Total					

Note: _**1)** Use A4 size page only for report. **2)** No file cover is required. **3)** After submission, presentation of the project will be schedule between **24 April 2023 to 29 April 2023**. The presentation schedule will be upload after submission date. **If you submit report by 22 April 2023, then only your group will be considered for presentation.** **4) Each group member has to upload the report on the UMS otherwise no further evaluation and the marks will be zero for the respective group member.**_

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Introduction

The 3 Way Automatic Street Light project is an innovative solution that aims to make street lighting more energy-efficient and cost-effective. The project uses advanced technology to automatically turn on and off street lights, depending on the ambient light conditions. This ensures that street lights are only turned on when necessary, saving energy and reducing electricity costs.

The project uses a combination of sensors, microcontrollers, and relays to achieve its objectives. It is a simple and effective solution that can be implemented in any city or town to improve the quality of street lighting.

Objective of the Project and Introduction to Components

The objective of the project is to design and build a system that can automatically control street lighting. The system uses sensors to detect ambient light conditions and turn the lights on or off accordingly. This reduces energy consumption and saves costs.

The components used in the project include:

Light Dependent Resistor (LDR) - A sensor that detects ambient light levels. Type of resistor that works on the photoconductivity principle means that resistance changes according to the intensity of light. Its resistance decreases with an increase in the intensity of light. It is often used as a light sensor, light meter, Automatic street light, and in areas where we need to have light sensitivity.

LEDs - Light-emitting diodes that provide the light source.

A light-emitting diode (LED) is a semiconductor device that emits light when an electric current flows through it.

Resistors(1k ohm)- A passive electrical component with two terminals that are used for either limiting or regulating the flow of electric current in electrical circuits. The main purpose of resistor is to reduce the current flow and to lower the voltage in any particular portion of the circuit**.**

Transistors (2N2222A)-The 2N2222A transistor is a common NPN BJT & it is mainly used in the applications of switching & amplifying with less power. This transistor is mainly designed for low power, low to medium current, medium voltage & works at fairly high speeds.

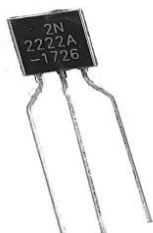**Battery-**The alkaline variant of the 9V battery is also referred to as 6LR61 and 006P.

PCB- A printed circuit board, or PC board, or PCB, is a non-conductive material with conductive lines printed or etched. Electronic components are mounted on the board and the traces connect the components together to form a working circuit or assembly.
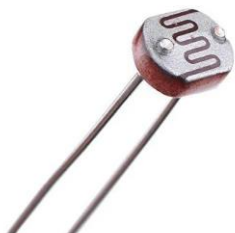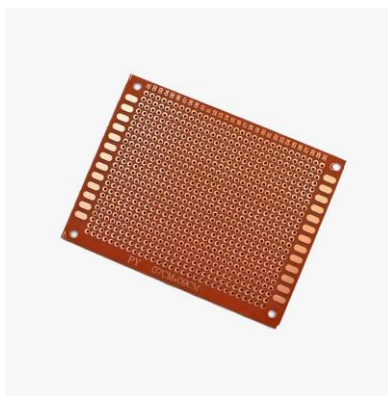
LEDs

Battery

Transistor
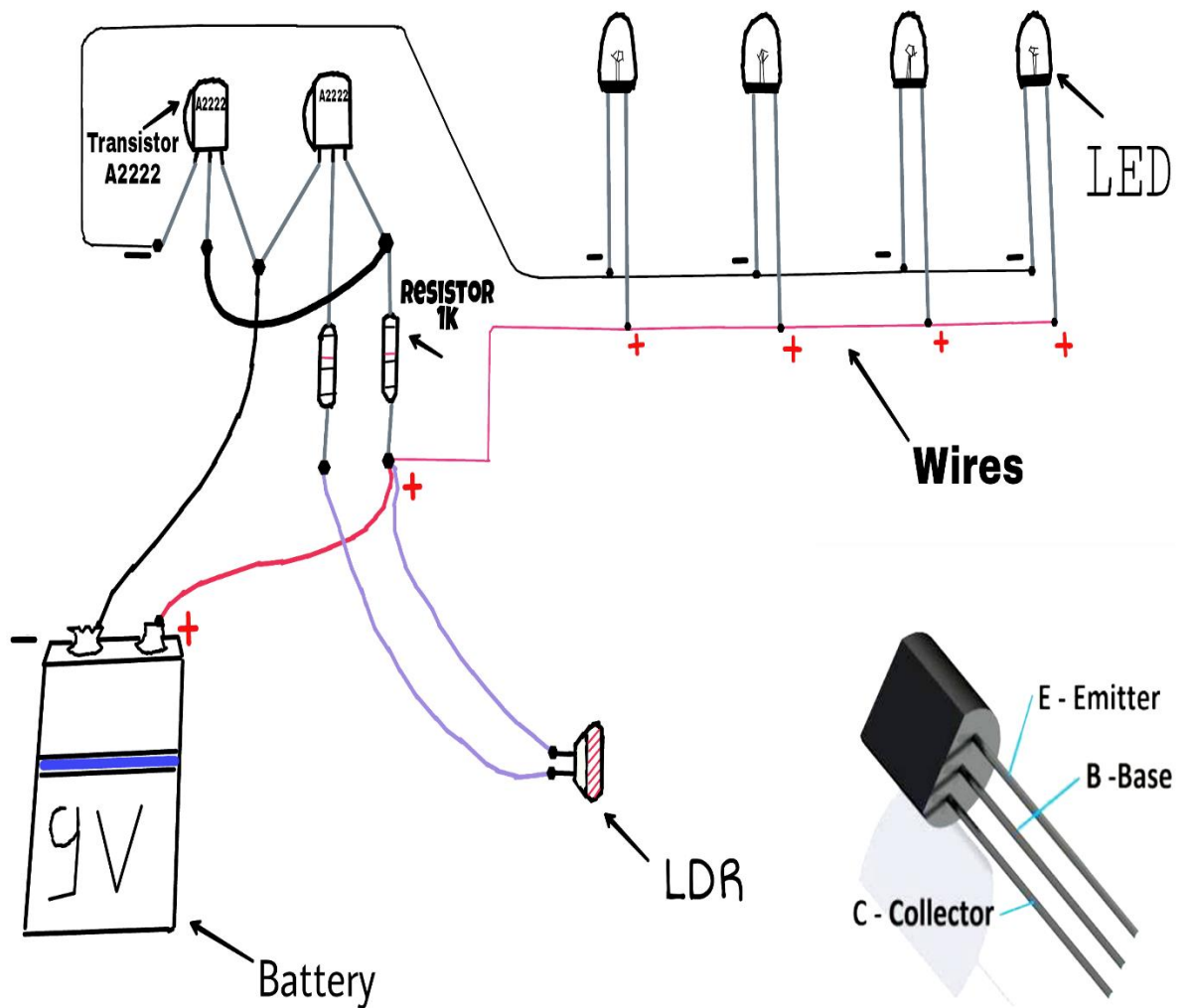

LDR

PCB

Resistors

Circuit Diagram

Transistor
A2222

A2222

A2222

RESISTOR
1K

LED

Wires

+

+

+

+

+

+

−

9V

E - Emitter

B - Base

C - Collector

LDR

Battery

<u>Body</u>

a) Purpose of Project

The purpose of the project is to develop an energy-efficient and cost-effective solution for street lighting. The system uses sensors to detect ambient light conditions and turns the lights on or off accordingly. This ensures that street lights are only turned on when necessary, reducing energy consumption and saving costs.

c) Basic Working of Project

The project uses an LDR to detect ambient light levels. When the ambient light levels fall below a certain threshold, the microcontroller turns on the street lights using the relay. When the ambient light levels increase above the threshold, the microcontroller turns off the street lights.

The system also includes a manual override switch that allows users to turn on the street lights manually, even when the ambient light levels are above the threshold.

d) Advantages/Disadvantages

The advantages of the project include:

Energy efficiency - The project ensures that street lights are only turned on when necessary, reducing energy consumption and costs.

Cost-effective - The project is a cost-effective solution for street lighting.

Simple and effective - The project is a simple and effective solution that can

e) Applications of the Project and Innovativeness

The 3 Way Automatic Street Light project has a wide range of applications. It can be implemented in any city or town to improve the quality of street lighting. The project is also suitable for use in parking lots, highways, and other outdoor areas.

The innovativeness of the project lies in its use of advanced technology to automatically control street lighting. The project is a simple and effective solution that can be implemented quickly and easily.

f) Learning Outcomes

The project provides valuable learning outcomes for students and hobbyists interested in electronics and programming. The project teaches the following:

The basics of electronics, including sensors, microcontrollers, and relays.

Programming concepts and techniques, including the use of Arduino IDE and C++ programming language.

Project management skills, including planning, execution, and testing.

The project also provides an opportunity for students and hobbyists to develop their problem-solving skills and creativity.

<u>Conclusion</u>

The 3 Way Automatic Street Light project is an innovative solution that provides energy-efficient and cost-effective street lighting. The project uses advanced technology to automatically turn on and off street lights, depending on ambient light conditions. The project is a simple and effective solution that can be implemented in any city or town to improve the quality of street lighting.

<u>Reference</u>

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Relay datasheet. Retrieved from
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LDR datasheet. Retrieved from
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EN-09088.pdf