

# **AUTOMATIC STREET LIGHT** **USING LDR**

**A PROJECT SUBMITTED**  
**TO**



**Department of physics**  
**Shree H.N.Shukla College of Science**  
**Rajkot**



**By:-**  
**RATHOD URVI**

**Guided By:-**  
**Ms. Bhumika Nimavat**

**March, 2021**

**A**  
**PROJECT REPORT ON THE MODEL OF**  
**“AUTOMATIC STREET LIGHT**  
**USING LDR”**

**In Partial fulfillment for the award of the degree**  
**Of**  
**BACHELOR OF SCIENCE**  
**IN**  
**PHYSICS**

**Submitted by**  
**RATHOD URVI**

**Under the Guidance of**  
**Ms. Bhumika R. Nimavat**

**Lecturer in**  
**Physics**

**Department of Physics**  
**Shree H. N. Shukla College of Science**  
**Rajkot**  
**March-2021**



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### Certificate

Exam No.....

THIS IS TO CERTIFY THAT **RATHOD URVI** A STUDENT OF **T.Y.B.Sc. PHYSICS** HAS SATISFACTORILY PREPARED INDIVIDUAL WORKING MODEL ON "**AUTOMATIC STREET LIGHT USING LDR**" AS PER THE SAURASHTRA UNIVERSITY SYLLABUS DURING THE <sup>V<sup>th</sup></sup> & <sup>VI<sup>th</sup></sup> SEM OF THE ACADEMIC YEAR 2020 – 2021.

PROJECT INCHARGE

HEAD OF THE DEPARTMENT

DATE:-

SHREE H.N.SHUKLA COLLEGE OF SCIENCE

RAJKOT

Name & Signature of Examiner

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## **DECLARATION**

I here by declare that the working model entitled “**AUTOMATIC STREET LIGHT USING LDR**” submitted to **Department Of Physics, Shree H.N.Shukla College Of Science – Rajkot** during the course of B.Sc.(Physics) semester V<sup>th</sup>& VI<sup>th</sup>, is prepared by me to demonstrate the underlying principle of **PHYSICS**. This project has not been submitted to any other examination.

**Place: Rajkot**

**Signature of the student**

**Date:**

**Name of the student**

*RATHOD URVI*

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## Acknowledgement

It is a great opportunity for a B.Sc. (Physics) student to prepare working model “**AUTOMATIC STREET LIGHT USING LDR**” to know about the fundamental as the recent technological aspects of the physics.

First of all, I am very much thankful to Saurashtra University and Department of physics to include this kind of subject in B.Sc. Physics syllabus in which students can acquire more knowledge regarding the selected topic of preparing working model by doing necessary reference work.

I am very much thankful to **Ms. Bhumika R. Nimavat** for keen interest as well as giving me her valuable time and co-operation to develop this working model report by providing valuable guidance.

At last I want to thank all those who helped me directly or indirectly during my project progress report.

**RATHOD URVI**

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## 1) Introduction

We are living in the world where everything goes to be automatic from your washing machine to your ceiling fan. Street lights are one of those examples of the automatic world. Automatic street light are those light which needs no manual operation to gets turn ON and OFF .did you ever try to make such kind of street lights that gets turn ON and turns OFF automatically? In this article , we are going to make automatic street light using LDR. The AUTOMATIC STREET LIGHTING CIRCUIT USING LDR is basically a switch automatically provides supply to the lamp when kept in darkness.

The automatic night light circuit controls the turn the power off consumption in home automation of resistance of the light dependent resistor {LDR} acts as an automatic switch. If it is daytime working to break the circuit but at night is connected to a working electrical

DC 6V supply.

The main purpose of designing this project is to prevent loss of current unnecessarily during day time. During night lamp will automatically glow.

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## *2) Principle*

**An** Automatic night light control system needs o manual operation of switching ON and OFF when there is need of light. It detects it self whether there is need for light or not. When darkness rises to a certain value then automatically light is switched ON or OFF.

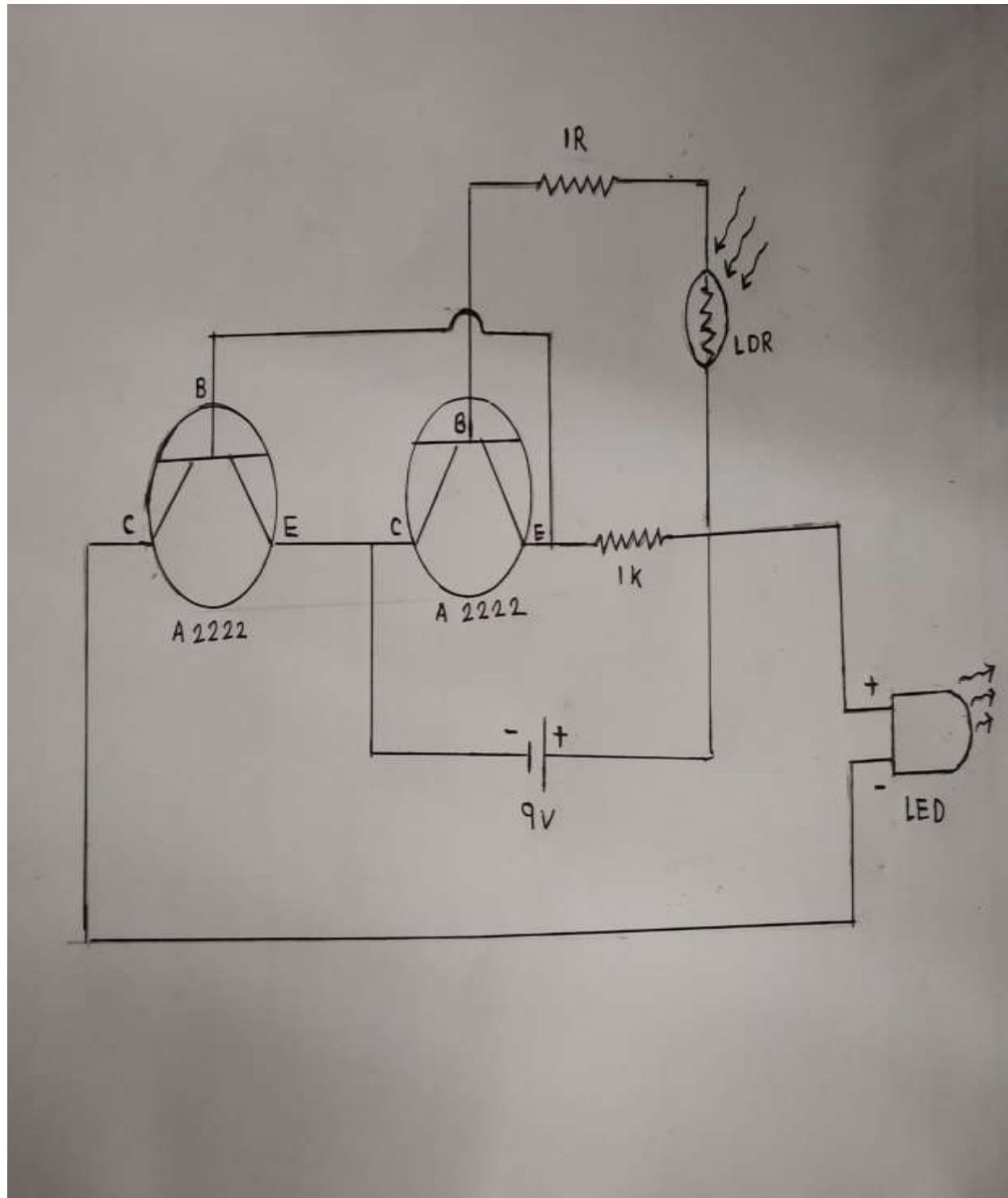
In the project we are using light dependant resistor **{LDR}** as a light sensor witching device. This projects all about to control the power consumption at the streets and eliminating manpower. This includes controlling a circuit of street light with specific sensors, LDR and microcontroller during day and night.





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### 3) CIRCUIT DIAGRAM





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### 4) IMAGE





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### 5) COMPONENT DESCRIPTION

<i><b>SR. NO.</b></i>	<i><b>COMPONENT</b></i>	<i><b>TYPE</b></i>	<i><b>PAGE NO.</b></i>
<i><b>A.</b></i>	<i><b>LDR</b></i>	<i><b>LIGHT SENSOR</b></i>	<i><b>07</b></i>
<i><b>B.</b></i>	<i><b>RESISTORS</b></i>	<i><b>1K</b></i>	<i><b>08</b></i>
<i><b>C.</b></i>	<i><b>TRANSISTOR</b></i>	<i><b>2222A</b></i>	<i><b>09</b></i>
<i><b>D.</b></i>	<i><b>LED</b></i>	<i><b>WHITE</b></i>	<i><b>10</b></i>
<i><b>E.</b></i>	<i><b>WIRES</b></i>	<i><b>COLOUR</b></i>	<i><b>11</b></i>
<i><b>F.</b></i>	<i><b>PCB</b></i>	<i><b>-</b></i>	<i><b>12</b></i>
<i><b>G.</b></i>	<i><b>BATTERY CONNECTOR</b></i>	<i><b>-</b></i>	<i><b>12</b></i>
<i><b>H.</b></i>	<i><b>BATTERY</b></i>	<i><b>9 VOLT</b></i>	<i><b>13</b></i>



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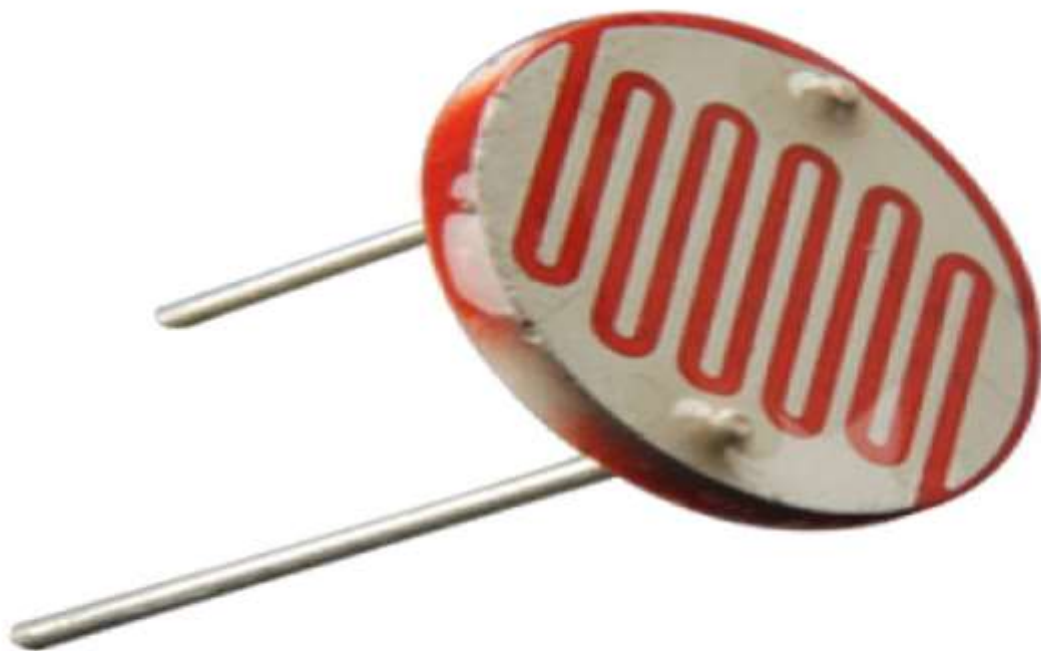
### LDR:

A photo resistor (or light-dependent resistor, LDR, or photocell) is a light-controlled variable resistor.

The resistance of a photo resistor decreases with increasing incident light intensity; in other words, it exhibits photoconductivity.

A photo resistor or light dependent resistor or photocell is a light controlled variable resistor.

A photo resistor can be applied in light sensitive detector circuit, and light and dark activated switching circuit. A photo resistor is made of a high resistance semiconductor.



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### RESISTOR 'S

A resistor is a passive two-terminal electrical component that implements electrical resistance as a circuit element.

Resistors act to reduce current flow, and, at the same time, act to lower voltage levels within circuits.

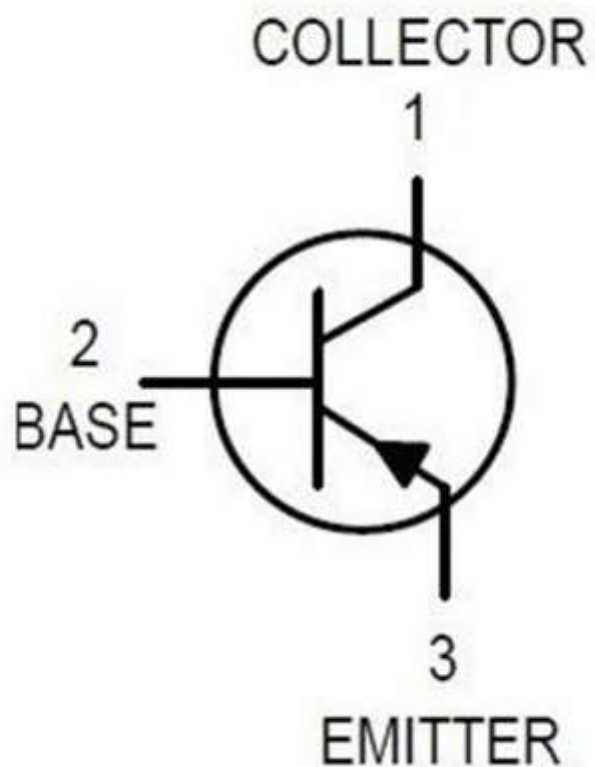
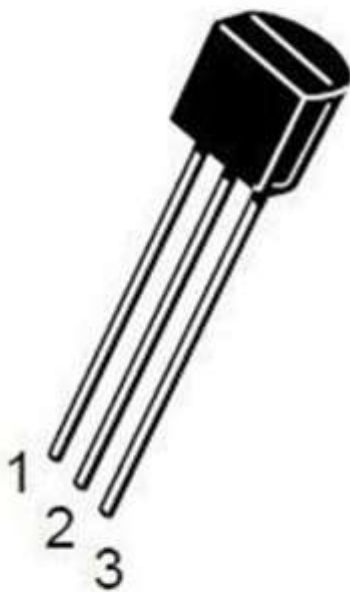
In electronic circuits , resistors are used to limit current flow to adjust signal levels, bias active elements and terminate transmission lines among other uses.



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### TRANSISTOR

A transistor is a semiconductor device used to amplify or switch electronic signals and electrical power. Transistors are one of the basic building blocks of modern electronics.[1] It is composed of semiconductor material usually with at least three terminals for connection to an external circuit. A voltage or current applied to one pair of the transistor's terminals controls the current through another pair of terminals. Because the controlled (output) power can be higher than the controlling (input) power,



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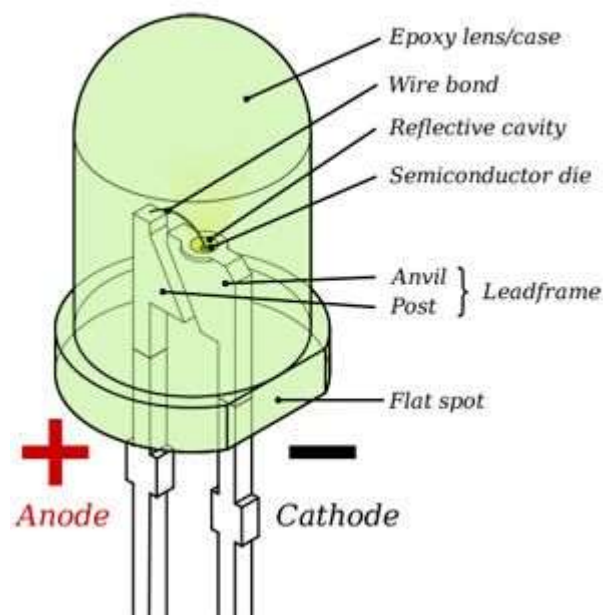
## LED (light emitting diode)

Working principal :- electroluminescence

LED is based on the semiconductor diode. When the diode is forward biased (switched on) electrons are able to recombine with holes and energy is released in the form of ght. This effect is called electroluminescence and the color of the light is determined by the energy gap of the semiconductor.

LED lamps have a lifespan and electrical efficiency which are several times longer than incandescent lamps, and significantly more efficient than most fluorescent lamps, with some chips able to emit more than 100 lumens per watt.

The LED lamp market is projected to grow by more than twelvefold over the next decade, from \$25 billion in 2023, a compound annual growth rate...



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### WIRES :

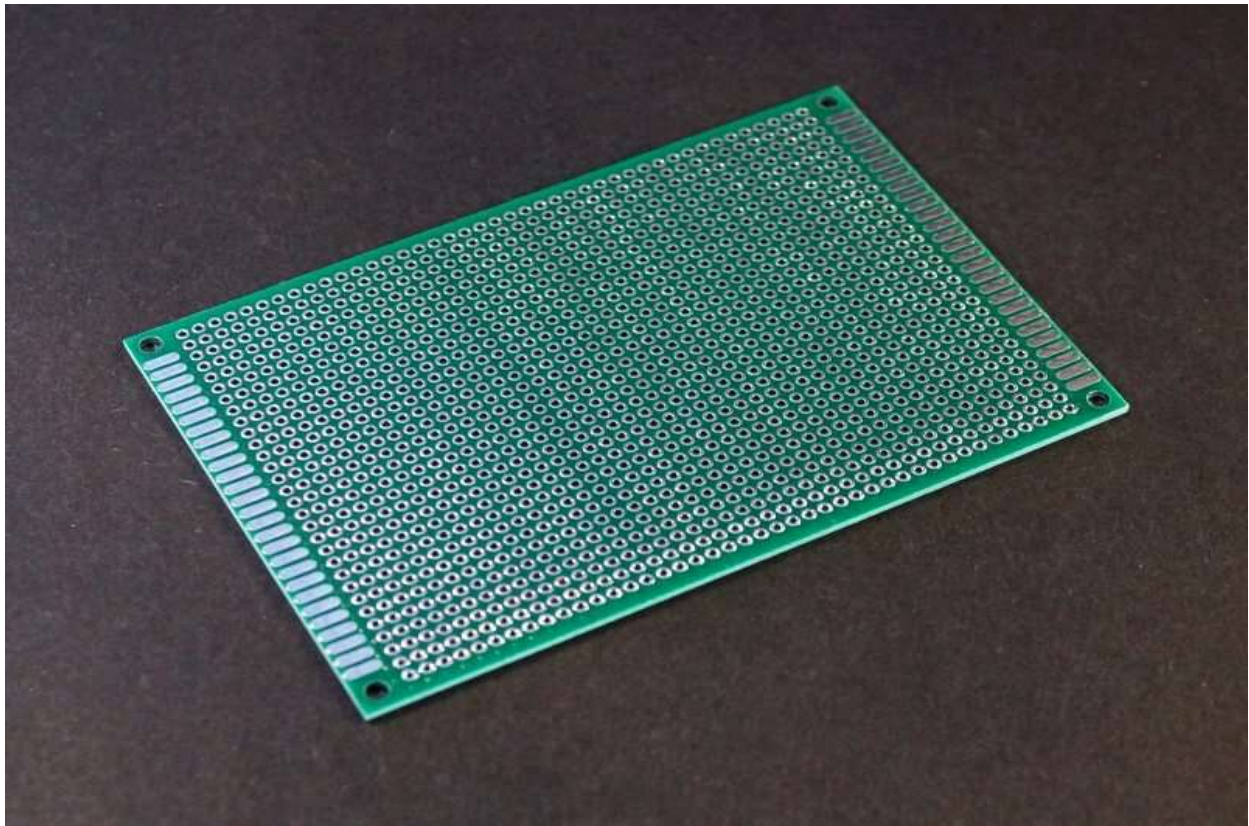
A wire is a single usually cylindrical, flexible strand or rod of metal. Wires are used to bear mechanical loads or electricity and telecommunications signals. Wire is commonly formed by drawing the metal through a hole in a die or draw plate. Wire gauges come in various standard sizes, as expressed in terms of a gauge number.





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 PCB :



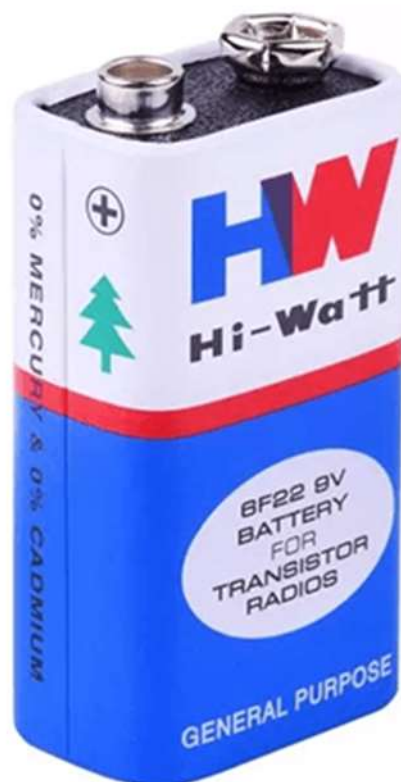
 BATTERY CONNECTOR :



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## BATTERY :

- A battery can be defined as an electrochemical device (consisting of one or more electrochemical cells) which can be charged with an electric current and discharged whenever required. Batteries are usually devices that are made up of multiple electrochemical cells that are connected to external inputs and outputs. Batteries are widely employed in order to power small electric devices such as mobile phones, remotes, and flashlights.



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## *6) WORKING*

- The working of **AUTOMATIC STREET LIGHTING CIRCUIT USING LDR** in this circuit.
- The use of power supply is D.C. 9 V battery with the help of 2 transistor, 2 resistors, 1 LDR, 1 battery connector, 1 battery 9 volt and 8 LEDS in this circuit.
- The working principle of LDR is that it gives less resistance in high light intensity and high resistance in low light intensity (ie) it gives high resistance in dark or night and low resistance in day or light.
- Here we use transistor as a two way switch. If the voltage through base is greater than 5V it send through the emitter. If the voltage through base is less than 5V the it sends through collector.
- During night the LDR gives a high resistance as a result the voltage passing through the base will become less than 5V so the LED glows.
- During day time LDR gives a low resistance as a result the voltage through base is greater than 5V which switches the current to the emitter. This turns LED off.

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## **7) Conclusions**

- This project of AUTOMATIC STREET LIGHTS is a cost effective, practical, ecofriendly and the safest way to save energy. It clearly tackles the two problems that world is facing today, saving of energy and also disposal of incandescent lamps, very efficiently. According to statistical data we can save more than 40 % of electrical energy that is now consumed by the highways. Initial cost and maintenance can be the drawbacks of this project. With the advances in technology and good resource planning the cost of the project can be cut down and also with the use of good equipment the maintenance can also be reduced in terms of periodic checks. The LEDs have long life, emit cool light, do not have any toxic material and can be used for fast switching. For these reasons our project presents far more advantages which can overshadow the present limitations. Keeping in view the long term benefits and the initial cost would never be a problem as the investment return time is very less. The project has scope in various other applications like for providing lighting in industries, campuses and parking lots of huge shopping malls. This can also be used for surveillance in corporate campuses and industries.

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## **8) ADVANTAGES**

- Complete elimination of manpower.
- Reduced energy costs.
- Reduced green house gas emission.
- Reduced maintenance costs.
- Higher community satisfaction.
- Fast payback.



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### *9) REFERENCE*

- <https://youtu.be/>
- [www.electronicscircuits.in](http://www.electronicscircuits.in)
- [www.wikipedia.com](http://www.wikipedia.com)
- [www.electronicsonline.org](http://www.electronicsonline.org)



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# THANK YOU