A.S.D.Government Degree College for Women
An Autonomous Institution
Jagannaickpur, Kakinada, Andhra Pradesh-533002
Affiliated to Adikavi Nannaya University, Rajamahendravaram

INTERNAL QUALITY ASSURANCE CELL

1.3.3. Percentage of Programs that have components of field projects/research projects/internships during the last five years

FIELD PROJECTS
(2019-2020)

A PROJECT REPORT
on
SMOKE DETECTOR

A Project Report submitted in partial fulfillment of requirement for the award of the degree of Bachelor of Science B.Sc. Computer Science

Submitted by

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D.Vasudha	1732014
M.Meena Kumari	1732025
M.Satya Sowmya	1732026
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Under the esteemed Guidance of
N.Naga Subrahmanyeswari
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2019-2020

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A PROJECT REPORT

on

SOIL MOISTURE SENSOR

A Project Report submitted in partial fulfillment of requirement
For the award of the degree of Bachelor of Science
B.Sc. Computer Science

Submitted by

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A PROJECT REPORT

on

AUTOMATIC DUSTBIN

A Project Report submitted in partial fulfillment of requirement

for the award of the degree of Bachelor of Science

B.Sc. Computer Science

Submitted by

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A PROJECT REPORT

ON

“Water Level Indicator”

A project report submitted in partial fulfillment of requirement
for the award of the degree of Bachelor of

B.Sc Computer Science

Submitted by

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2019-2020

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We are thankful to our lab programmer, parents and friends who have directly and indirectly helped us in the completion of the project.

DECLARATION

We here by declare that the project work entitled “Water level Indicatior” Submitted to the A.S.D.GOVT. DEGREE COLLEGE FOR WOMEN(A), KAKINADA, is a record of an original work done by us under The guidance of Mrs. N.Naga Subrahmanyeswari Head of the Dept of Computer Science and this project work is submitted in the partial fulfillment of the requirements for the award of degree of B.Sc(Computer Science). The result embodied in the thesis have not been submitted to any other University of Institute for the award of any degree of diploma.

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ABSTRACT

Abstract

The drinking water crisis in India is reaching alarming proportions. It might very soon attain the nature of global crisis. Hence, it is of extreme importance to preserve water. In home based water tank, the one problem is very common to us is that the control of water level of overhead tank, as a result the wastage of water is increasing day by day. But we all know water is very precious to us. This problem can be controlled by a simple electronic circuit which consists of some cheap electronic components, that circuit is called 'Water Level Indicator'. The operation of water level controller works upon the fact that water conducts electricity. So water can be used to open or close a circuit. As the water level rises or falls, different circuits in the controller send different signals. These signals are used to switch ON or switch OFF the motor pump as per our requirements. Water Level Indicator is a simple low cost circuit built using Internet of Things(IoT). The circuit is made up of various components like transistors (BC547.BC548), Resistors, LEDs etc., Water Level Indicator can be used as the best solution for saving water in the current scenario.

INTRODUCTION

1. Introduction

A Water Level Indicator may be defined as a system by which we can get the information of any water reservoir. Water level indicator system is quite useful to reduce the wastage of water from any reservoir, while filling such reservoir.

Water is most essential thing on earth .Safe drinking water is essential to human and other life forms even though it pro-vides no calories or organic nutriants. The total amount of water available on Earth has been estimated at 1.4 billion cubic kilometers, enough to cover the planet with a layer of about 3 km. About 95% of the Earth's water is in the oceans, which is unfit for human consumption. About 4% is locked in the polar ice caps, and the rest 1% constitutes all fresh water found in rivers, streams and lakes which is suitable for our consumption. A study estimated that a person in India consumes an average of 135 litters per day. This consumption would rise by 40% by the year 2025. This signifies the need to preserve our fresh water resources.

However, some observers have estimated that by 2025 more than half of the world population will be faced water based vulnerability. The presence of water level indicator in reservoir can help control wastage and water inadequacy in such reservoir. Water level indicator is used to show level of water in an overhead tank, this keeps the user informed about the water level at all-time avoids the situation of water running out when it is most needed. Indicators circuits have also alarm features. It not indicate amount of water present in overhead tank but also gives an alarm when tank is full.

Advantages of the proposed water level controller are, very less maintenance, very low cost, very simple construction and the circuit involved is also relatively simpler. It can be easily made at home. After assembling the system, what remains is to observe its operation and efficiency. This can be done by breaking down the activity of the controller from the detection of water to the working of the pump. We go over the responses obtained when water reaches the sensors and the logic employed be-hind it. We also try to justify how a system as simple as ours can compete with those available commercially.

1.1 Introduction to the Internet of Things

The Internet of Things (IOT) is a new, but at the same time an old term. It was already mentioned by Kevin Ashton in 1999, while holding a presentation at Proctor & Gamble. He used the term to link the idea of radio frequency identification (RFID) to the then new topic Internet. Since then the use of this term has blossomed and major companies have predicted an increase in IOT.

One prediction is that the number of connected things in the world will have a thirtyfold increase between 2009 and 2020, thus by 2020 there will be 26 billion things that are connected to the Internet. The reason IOT has become so huge depends partly on two things: Moore's law and Koomey's law. Moore's law states that the number of transistors on a chip doubles approximately every two years. This has enabled people to develop more powerful computers on the same sized chip. Intel, a well-known semiconductor chip maker had during 1971, 2300 transistors on a processor and by 2012 their current processors contained 1.4 billion transistors. This is an increase of approximately 610 000 % and it is expect that this trend will continue.

Koomey's law explains that the number of computations per kilowatt-hour roughly doubles every one and a half years. Kevin Ashton states that these two laws have together enabled us to create powerful and energy efficient computers. By turning the graph for Moore's law upside down it can be interpreted as the size of a computer (of a fixed capacity) is halved every two years. Doing the same thing to Koomey's law can be interpreted as the amount of energy needed to perform a computation is dropping at a rapid rate. Combining these interpretations tells us that we can perform the same amount of computations on increasingly a smaller chip, while consuming decreasing amounts of energy - hence computations are becoming more energy efficient. The potential result is a small, powerful, and energy efficient computer which enables us to provide more advanced services using less chip area and at a lower energy that what has been possible before.

Defining the term IOT can be somewhat difficult because it has many definitions depending on who is defining the term. The basic concept of IOT is to connect things together, thus enabling these "things" to communicate with each other and enabling people to communicate with them.

What these things are varies depending on which context the term is used and the aim of using the thing. In this thesis we have chosen to follow the definition of IOT proposed by ITU's Telecommunication Standardization Sector (a United Nations agency which specializes in ICT): "... a global infrastructure for the information society, enabling advanced services by interconnecting (physical and virtual) things based on existing and evolving interoperable information and communication technologies". Interconnecting the physical world with the virtual world and applying this concept to all things opens up new possibilities in the sense of being able to at any time access anything from any place. Providing new possibilities will also generate new threats, security risks, and expose vulnerabilities in the unexplored world of interconnected everything. "Things" in the physical world are objects that physically exist and from the perspective of IOT we are able to sense, operate, and connect to these things, while in the virtual world "things" are objects that can be stored, accessed, and processed.

IOT involves sensors in order to collect information. Sensors are already being used in daily life, however most people may not realise it. Smartphones contain different kind of sensors, such as accelerometers, cameras, and GPS receivers. Built-in sensors are nothing new in today's society.

Kevin Ashton said that IOT is already happening, but we might not see it compared to Smartphones which can both be seen and touched. RFID is such an IOT-technology that exists but is not necessarily seen; so the development of IOT might progress a long way before it is visible for everyone.

1.2 Background for the Internet of Things

The most vital part of achieving IOT is communication, because in order to interconnect different devices they must be able to communicate. All other properties, such as sensing, manoeuvring, being able to capture, store, and process data are unnecessary; unless your device specifically requires one of these properties. However, the ability to communicate is essential when labelling a device as an IOT device. How this communication is performed is less important, since the actual physical and link layer communication within IOT can be realized in many ways.

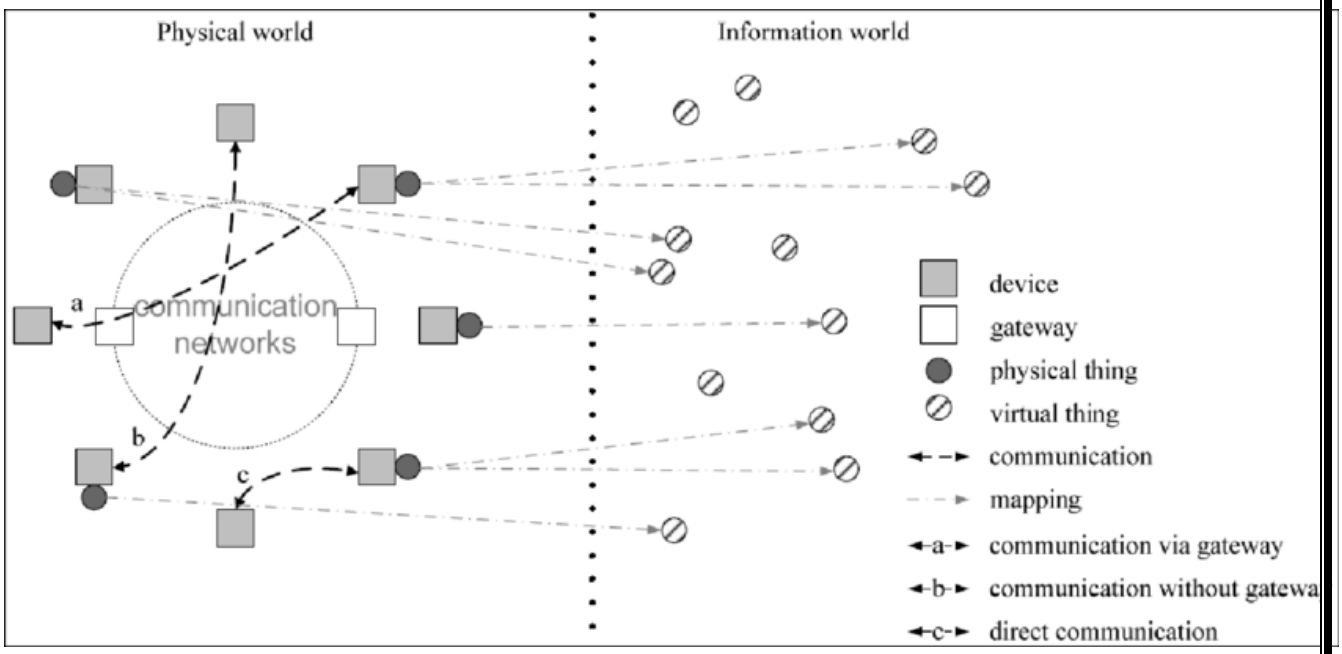

Figure 1.1: Overview of the Internet of Things

Figure 1.1 shows that devices are not always required to communicate through a communication network. For example, if two devices are close to each other it might be simpler to directly communicate via for example radio using technologies such as Bluetooth or ZigBee (protocol which both enable direct communication). In contrast, in CaseA in Figure 1.1 a device might communicate via a gateway using one protocol (such a IPv6 over Low power Wireless Personal Area Networks (6LoWPAN)) and then the gateway could communicate using another protocol (e.g. IPv4) over a communication network such as the Internet. Case B in Figure 1.1 illustrates two devices which are directly communicating with one another without requiring a gateway where both devices are directly connected to the communication network and thus are able to communicate even if they are located in different places.

A physical thing can be mapped into the information world via one or more virtual things, while virtual things do not necessarily need to be associated with any physical thing and can exist independently of any physical existence. For example, a physical thing might execute multiple applications and thereby have multiple identities in the virtual world. Similarly a virtual thing might also have many identities in the virtual world. For example, a virtual thing could be a video (file) on a USB-drive. Such a file might have multiple file names that refer to it and it might even have multiple instances (copies), potentially these "copies" might have different encodings, resolutions, etc.

1.2.1 The IOT reference model

The ITU-T has defined a reference model for IOT. This model is divided into the four layers: application layer, service support and application support layer, network layer and device layer (see Figure 1.2). Each one of these layers also includes management and security capabilities.

As shown in the figure these capabilities have both generic and specific capabilities that can cut across multiple layers.

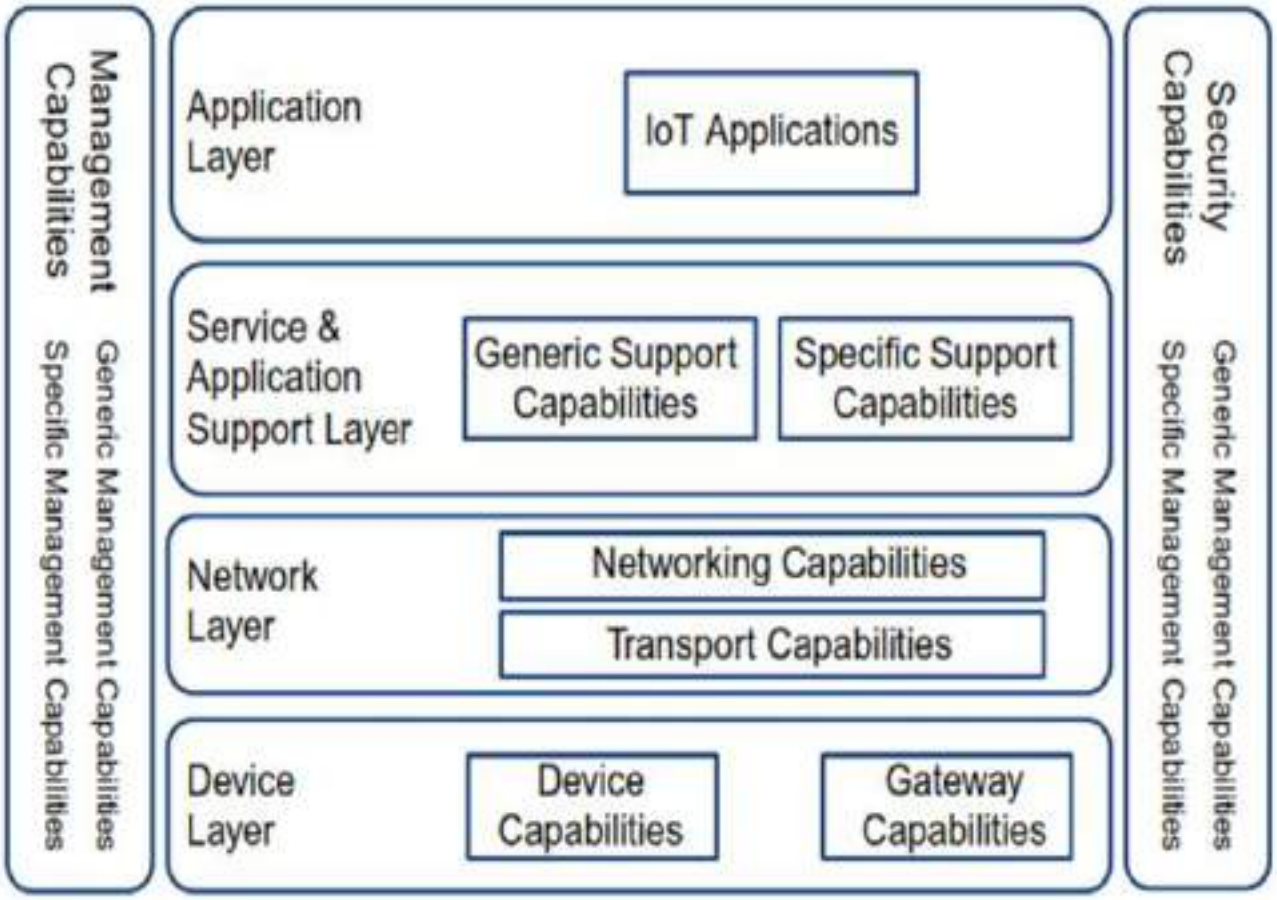

Figure 1.2: ITU-T reference model for IOT. Taken from Recommendation ITU-T Y.2060

The application layer contains IOT applications which require certain support capabilities from the underlying layer to function. The service and application support layer consists of generic support capabilities which can be used by IOT applications, examples of such capabilities could be data processing or storage. The specific support capabilities are those other than the generic capabilities which are required to create support for diversified applications. The network layer is divided into networking and transport capabilities. The networking capabilities provide relevant control functions for network connectivity, while the transport capabilities focus on the transport of IOT service and application specific data. At the bottom of the model, there is the device layer in which the device capabilities include direct and indirect interaction with the communication network. Unlike direct interaction, indirect interaction requires a gateway to be able to send and receive information via the network. Two other capabilities are ad hoc networking and sleeping and waking up which enable devices to connect in an ad hoc manner and saving energy (respectively).

The device layer also includes gateway capabilities to support devices connected via different types of wired and wireless technologies by supporting multiple interfaces. In some situations, protocol conversion is needed to support communication between devices using different protocols at the device and network layer. Generic management capabilities include device management (such as remote device activation, de-activation, diagnostics, and firmware or software updates) and local network topology, traffic, and congestion management. The generic security capabilities are independent of the application and include authorization and authentication at the application, network, and device layer. Moreover, all of the layers have their own individual capabilities. These include:

At the application layer application data confidentiality and integrity protection, privacy protection, security audit and anti-virus;

At the network layer signalling data confidentiality and integrity protection; and At the device layer device integrity validation, access control, data confidentiality, and integrity protection. Both the specific management and security capabilities are closely coupled with application-specific requirements, for example mobile payment.

1.2.2 How is the term IOT used today?

Since 1999 the term IOT has been used in many places and in many ways. Multiple research papers, books, and white papers about IOT have been written in order to help both the public and companies understand what IOT is. Many definitions of IOT have been independently introduced by both individuals and companies.

Technical companies that are already somewhat involved in IOT and who believe that IOT has a business potential for their future mostly use the term to describe a way of improving efficiency of production and innovation. Cisco defines IOT as concept where more and more things will be connected to the Internet in order to ease people's daily life. However, as we connect more things, the need for IPv6, big data, and cloud computing will increase and the concept of IOT will transition into an Internet of Everything (IOT). Cisco views IOT as a phase where the number of connected devices increases, while this phase changes once everything connected.

IBM has a definition of IOT which is more about connecting systems together, rather than just connecting devices together; thus, their focus is on creating a system of systems. They describe IOT as a means to create a smarter planet. They split these means into two parts: "One is to be more efficient, be less destructive, to connect different aspects of life which do affect each other in more conscious, deliberate and intelligent ways. But the other is also to generate fundamentally new insights, new activity, new forms of social relations".

Individual definitions include that given by Dr.John Barrett, Head of Academic Studies for Embedded Systems Research at Cork Institute of Technology in a TEDX talk on the requirement for

IOT: In the context of IOT all things will need a unique identity (IPv6), ability to communicate, in some way sense (see, smell, touch, etc.) and to be controlled. With all the collected data there is a need for a practical and efficient way to present the data that is relevant in a certain context.

Deciding what is relevant becomes a core question. It is up to the things themselves to decide what is relevant and what is not. In some cases the "relevant" data may be misused in a way that negatively effects people. For example, a device monitoring your health can be used to notify the hospital if your health is in critical condition. However, by using the same information as the hospital, your insurance company automatically increases your health insurance premium by 25%.

Another interesting individual definition is given by Kevin Ashton, who continues to give presentations regarding IOT. Like many others he sees IOT as fundamental for creating solutions for future problems. He defines IOT as computers sensing the real world by themselves and for themselves, thus information about things in the world can be available via the Internet. The problem with IOT is not deploying sensors everywhere; but rather the creation of systems that are able to exploit all of the available data and automatically figure out what it means.

Today, there is some common ground between individuals and research papers when writing about IOT as both highlight the possibilities of IOT and emphasize the need for privacy and security.

1.2.3 Where is the term IOT being used?

The term IOT is being used in different contexts, such as the body, homes, cities, industry, and the global environment.

• When talking about the home, IOT is often considered in terms of remote and local monitoring and management of different home electronics and lights, or simply to keep plants in the yard alive by using an automatic watering system. Today this is becoming a very important area as more and more areas are facing shortage of water, hence traditional approaches to watering house plants and gardens are no longer feasible.

• In correlation to cities, the term IOT is used to describe systems that effectively gather and process information generated by various infrastructures, for example monitoring centers for traffic lights, street lights, camera surveillance and the power grid. These systems offer the potential to improve the flow of vehicles and people through the city centers and also greatly improving the energy efficiency of transport systems, while also improving personal and societal safety.

.• Last, but not least important, is environmental monitoring where IoT can help us understand and better manage those resources we have. Sensors can help protect wildlife, track water usage and flows, monitor local weather, monitor use of natural resources, or give warnings before and after natural disasters to prepare people for what is to come. In fact, it appears that to achieve high environmental efficiency requires increasing use of information technology (whether this is in production, consumption, recycling, or post-recycling phases).

The activities of Artificial Intelligence (AI) can be spread around in IOT and does not require that all the activities occur in the same place. In IOT, the collection of all these activities is what creates the AI. The flow of data in regards to sensing and processing can be presented in different ways. The flow can be as simple as an object acquiring data through a sensor, which it then processes and finally transmits in the form of a data packet, as show Figure.1.3.

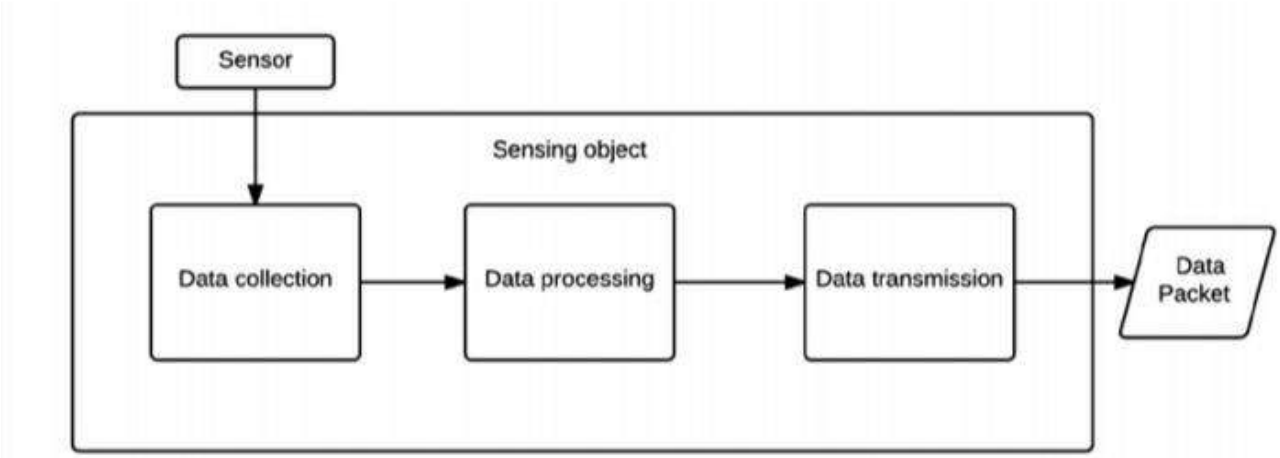

Figure 1.3: Example of Dataflow

Another example is a framework for an industrial park which has a system that is capable of perceiving, analysing, and predicting future events. The scenario is an enterprise where all its power equipment is controlled within the IOT. The system will be able to predict different events, such as if the power system will reach its peak by the next measurement and through calculation be able to predict if the peak will exceed the expected power limit. Using these predictions the system can affect these predictions by affecting the power usage by for example, lowering the power of electric equipment, shutting off electronic equipment, or utilizing alternative power sources before the predicted over limit occurs. Figure 1.4 illustrates a scenario where the equipment senses its power usage and collects data, transfers it to a transmission platform, which in turn collects data from multiple objects (i.e. all the equipment in a building) and then sends the collected data to a remote third party service provider who processes all the data and takes some action that in the end affects the power usage within the enterprise.

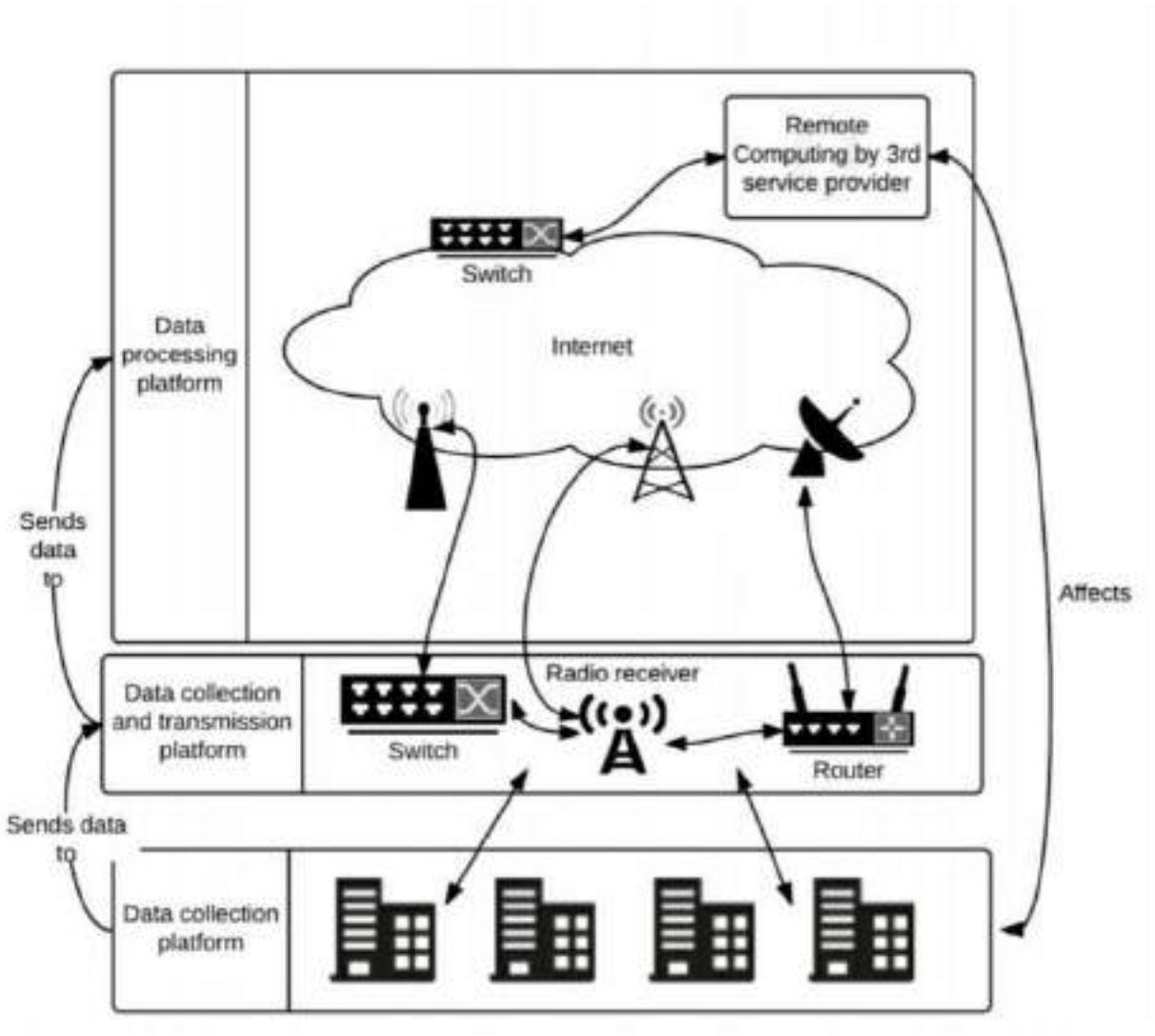

Figure 1.4: Framework of an IoT industrial park

The simplest way of describing a data processing flow is a monitoring object collecting data which is sent to a computation device that processes and analyses the data. The computation device then sends the result to a terminal which executes a command based on the result or simply presents the data to for example a user. This data processing flow can be seen in Figure.

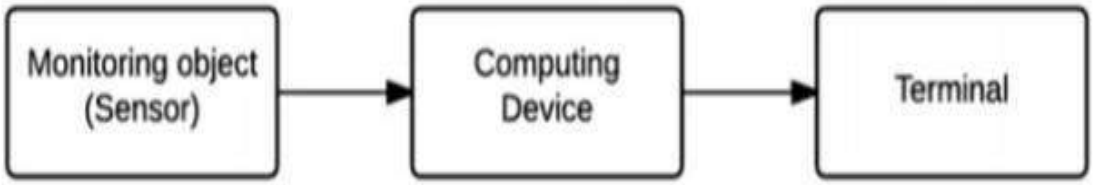

Figure 1.5: Simple data processing flow

Nothing states that within IOT the processing of data occurs only once during the dataflow in IOT. It is possible to combine the flow in Figure 1.3 and Figure 1.5. The sensor itself might do some processing before the data is sent to a larger collection point which in turn sends the data to a processing point. The use of remote processing is especially relevant when the system consists of multiple objects that together provide the data necessary in order to decide if for example a command needs to be executed or not, as in Figure 1.4. The artificial intelligence (AI) is not necessarily positioned in the same place (platform/device) since their placement will depend upon the structure of the IOT-environment. In the case of the Bigbelly system, the garbage bins are equipped with an integrated circuit with a processor that monitors the garbage bin, thus realizing a fully automated system which senses trash level, fullness, and machine status. Here some of the computation is done by the object (garbage bin) itself and the result sent to the terminal, which in this case is the Bigbelly cloud. The Bigbelly cloud analyses all the data it receives from the different garbage bins and presents this data to the user in different ways, such as a map the location of these bins and their status (trash level/fullness). In this case the terminal only presents the results to a user and does not execute a command based on these results.

LITERATURE REVIEW

2. Literature review

In an analytical study conducted by the Delhi Committee of the Associated Chambers of Commerce and Industry of India (ASSOCHAM), it has been revealed that there has been a substantial increase in the wastage of water due to numerous reasons. According to ASSOCHAM, the percentage of water wasted has been increased to an alarming 40% as compared to the previous year. On February 11, 2018 the British Broadcasting Corporation (BBC) put Bengaluru on a list of 11 major cities in the modern era having maximum water related problems. The BBC blames a spike in population growth and new property developments, Bengaluru's struggle to manage its water and sewage systems, and a colossal waste of drinking water due to poor plumbing. Also, many villages in the interior of Maharashtra and many other states are facing major water shortage due to drought and water supply mismanagement. Our system is an initiative to help curb or at least reduce these water wastage and scarcity issues throughout the nation. Delhi Jal Board had taken a decision to punish the consumers for overflowing tanks. Water consumers who switch on their motors to fill their overhead tanks and then forget to switch them off have to pay the respective penalties

Water Level Monitoring can be found in many areas since before. Various types of Water Level Monitoring system based on the control are: 1. Individual systems: This is a very popular type of systems. Here the whole model is implemented on a targeted single source system. 2. Large control systems: Here the water level is implemented on a very large scale basis and huge amounts of sensors are used. 3. Central Control systems: Computerized systems programmed to handle all the functions of multiple utilities like air conditioning system or home entertainment systems, refrigerators all at the same instant regardless of your presence. Control system can be accessed through telephone or internet from any corner of the world. Based on the method of automation various types are as follows:

1. Bluetooth based Water Level Monitoring: Here Bluetooth plays a major role in alerting the anomalies.
2. Remote Water Level Monitoring: In this, the system is controlled remotely.
3. Automatic Water Level Monitoring: The system is programmed to automatically perform some defined actions.

The internet of things, or IOT, is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.

A thing in the internet of things can be a person with a heart monitor implant, a farm animal with a biochip transponder, an automobile that has built-in sensors to alert the driver when tire pressure is low or any other natural or man-made object that can be assigned an Internet Protocol (IP) address and is able to transfer data over a network.

2.1. IOT standards and frameworks

There are several emerging IoT standards, including the following:

- IPv6 over Low-Power Wireless Personal Area Networks (*6LoWPAN)* is an open standard defined by the Internet Engineering Task Force (IETF). The 6LoWPAN standard enables any low-power radio to communicate to the internet, including 804.15.4, Bluetooth Low Energy (BLE) and Z-Wave (for home automation).
- ZigBee is a low-power, low-data rate wireless network used mainly in industrial settings. ZigBee is based on the Institute of Electrical and Electronics Engineers (IEEE) 802.15.4 standard. The ZigBee Alliance created Dotdot, the universal language for IoT that enables smart objects to work securely on any network and understand each other.
- LiteOS is a Unix-like operating system (OS) for wireless sensor networks. LiteOS supports smartphones, wearables, intelligent manufacturing applications, smart homes and the internet of vehicles (IoV). The OS also serves as a smart device development platform.
- OneM2M is a machine-to-machine service layer that can be embedded in software and hardware to connect devices. The global standardization body, OneM2M, was created to develop reusable standards to enable IoT applications across different verticals to communicate.

- Data Distribution Service (DDS) was developed by the Object Management Group (OMG) and is an IoT standard for real-time, scalable and high-performance M2M communication.
- Advanced Message Queuing Protocol (AMQP) is an open source published standard for asynchronous messaging by wire. AMQP enables encrypted and interoperable messaging between organizations and applications. The protocol is used in client-server messaging and in IoT device management.
- Constrained Application Protocol (CoAP) is a protocol designed by the IETF that specifies how low-power, compute-constrained devices can operate in the internet of things.
- Long Range Wide Area Network (LoRaWAN) is a protocol for WANs designed to support huge networks, such as smart cities, with millions of low-power devices.

2.2 Consumer and enterprise IOT applications

There are numerous real-world applications of the internet of things, ranging from consumer IoT and enterprise IoT to manufacturing and industrial IoT (IIoT). IoT applications span numerous verticals, including automotive, telecom and energy.

In the consumer segment, for example, smart homes that are equipped with smart thermostats, smart appliances and connected heating, lighting and electronic devices can be controlled remotely via computers and smartphones.

Wearable devices with sensors and software can collect and analyze user data, sending messages to other technologies about the users with the aim of making users' lives easier and more comfortable. Wearable devices are also used for public safety -- for example, improving first responders' response times during emergencies by providing optimized routes to a location or by tracking construction workers' or firefighters' vital signs at life-threatening sites.

In healthcare, IoT offers many benefits, including the ability to monitor patients more closely using an analysis of the data that's generated. Hospitals often use IoT systems to complete tasks such as inventory management for both pharmaceuticals and medical instruments.

Smart buildings can, for instance, reduce energy costs using sensors that detect how many occupants are in a room. The temperature can adjust automatically -- for example, turning the air conditioner on if sensors detect a conference room is full or turning the heat down if everyone in the office has gone home. In agriculture, IoT-based smart farming systems can help monitor, for instance, light, temperature, humidity and soil moisture of crop fields using connected sensors. IoT is also instrumental in automating irrigation systems. In a smart city, IoT sensors and deployments, such as smart streetlights and smart meters, can help alleviate traffic, conserve energy, monitor and address environmental concerns, and improve sanitation.

2.3 IOT security and privacy issues

The internet of things connects billions of devices to the internet and involves the use of billions of data points, all of which need to be secured. Due to its expanded attack surface, IoT security and IoT privacy are cited as major concerns.

In 2016, one of the most notorious recent IoT attacks was Mirai, a botnet that infiltrated domain name server provider Dyn and took down many websites for an extended period of time in one of the biggest distributed denial-of-service (DDoS) attacks ever seen. Attackers gained access to the network by exploiting poorly secured IoT devices. Because IoT devices are closely connected, all a hacker has to do is exploit one vulnerability to manipulate all the data, rendering it unusable. Manufacturers that don't update their devices regularly -- or at all -- leave them vulnerable to cybercriminals.

Additionally, connected devices often ask users to input their personal information, including names, ages, addresses, phone numbers and even social media accounts -- information that's invaluable to hackers.

Hackers aren't the only threat to the internet of things; privacy is another major concern for IoT users. For instance, companies that make and distribute consumer IoT devices could use those devices to obtain and sell users' personal data.

Beyond leaking personal data, IoT poses a risk to critical infrastructure, including electricity, transportation and financial services.

2.4 Applications of IoT

Smart Home

With IOT creating the buzz, 'Smart Home' is the most searched IOT associated feature on Google. But, what is a Smart Home?

Wouldn't you love if you could switch on air conditioning before reaching home or switch off lights even after you have left home? Or unlock the doors to friends for temporary access even when you are not at home. Don't be surprised with IOT taking shape companies are building products to make your life simpler and convenient. Smart Home has become the revolutionary ladder of success in the residential spaces and it is predicted Smart homes will become as common as smartphones. The cost of owning a house is the biggest expense in a homeowner's life. Smart Home products are promised to save time, energy and money. With Smart home companies like Nest, Ecobee, Ring and August, to name a few, will become household brands and are planning to deliver a never seen before experience.

Figure 2.1 Example of IoT (Internet Of Things) Smart Home

Connected Cars

The automotive digital technology has focused on optimizing vehicles internal functions. But now, this attention is growing towards enhancing the in-car experience. A connected car is a vehicle which is able to optimize it's own operation, maintenance as well as comfort of passengers using onboard sensors and internet connectivity.

Most large auto makers as well as some brave startups are working on connected car solutions. Major brands like Tesla, BMW, Apple, Google are working on bringing the next revolution in automobiles.

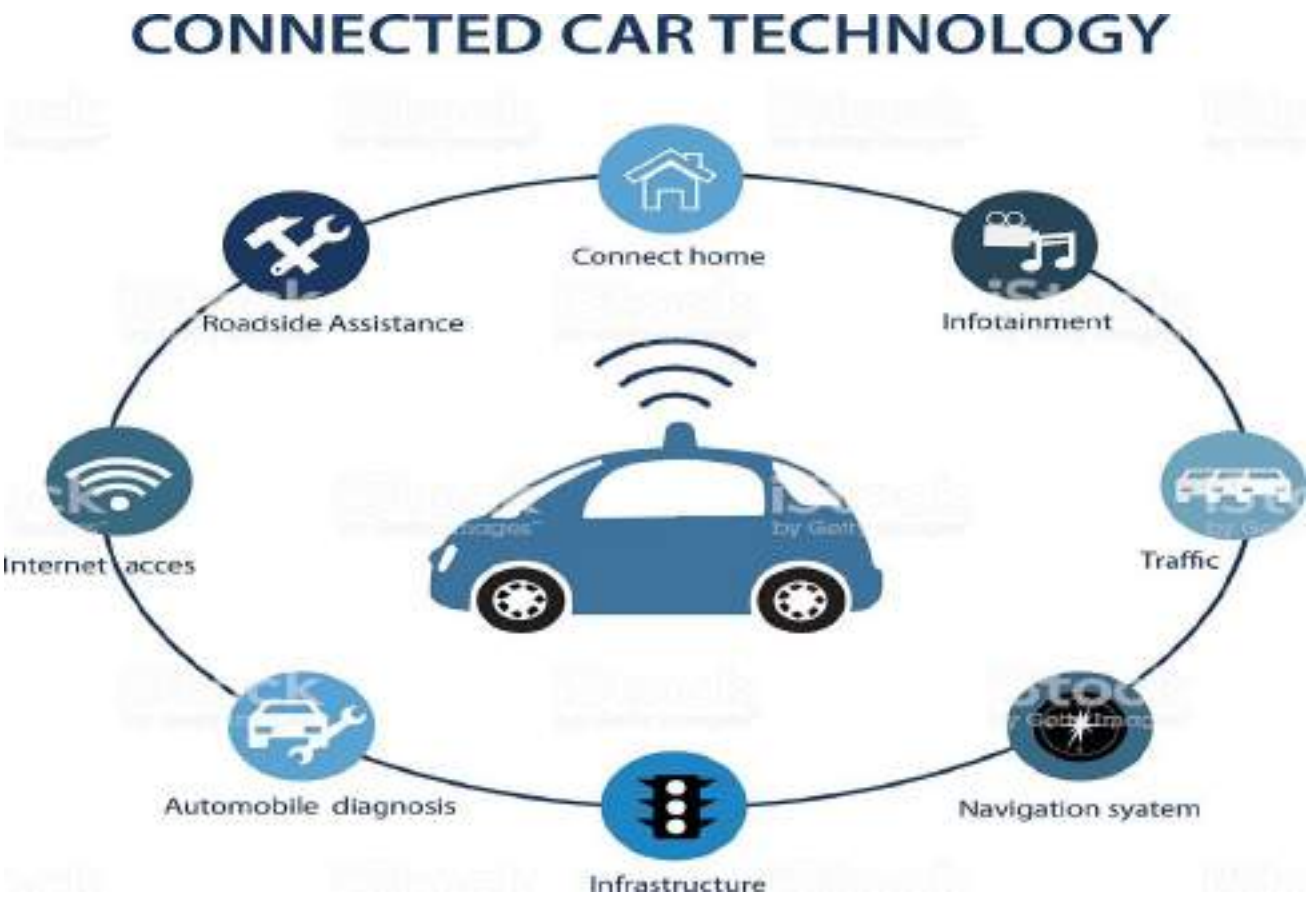

Figure 2.2 Example of IoT (Internet Of Things) Connected Car

Industrial Internet

Industrial Internet is the new buzz in the industrial sector, also termed as Industrial Internet of Things (IIOT). It is empowering industrial engineering with sensors, software and big data analytics to create brilliant machines.

According to Jeff Immelt, CEO, GE Electric,IIOT is a "beautiful, desirable and investable" asset. The driving philosophy behind IIOT is that, smart machines are more accurate and consistent than humans in communicating through data. And, this data can help companies pick inefficiencies and problems sooner. IOT holds great potential for quality control and sustainability. Applications for tracking goods, real time information exchange about inventory among suppliers and retailers and automated delivery will increase the supply chain efficiency. According to GE the improvement industry productivity will generate $10 trillion to $15 trillion in GDP worldwide over next 15 years.

Figure 2.3 Example of IoT (Internet Of Things) Industrial Internet

IoT in Agriculture

With the continous increase in world's population, demand for food supply is extremely raised. Governments are helping farmers to use advanced techniques and research to increase food production. Smart farming is one of the fastest growing field in IoT.

Farmers are using meaningful insights from the data to yield better return on investment. Sensing for soil moisture and nutrients, controlling water usage for plant growth and determining custom fertilizer are some simple uses of IoT.

Figure 2.4 Example of IoT (Internet of Things) Agriculture

IoT in Healthcare

Connected healthcare yet remains the sleeping giant of the Internet of Things applications. The concept of connected healthcare system and smart medical devices bears enormous potential not just for companies, but also for the well-being of people in general. Research shows IoT in healthcare will be massive in coming years. IoT in healthcare is aimed at empowering people to live healthier life by wearing connected devices.

The collected data will help in personalized analysis of an individual's health and provide tailor made strategies to combat illness. The video below explains how IoT can revolutionize treatment and medical help.

Figure 2.5 Example of IoT (Internet of Things) Health care

METHODOLOGY

3. METHODOLOGY

3.1 Pins Configured as INPUT

Arduino pins are by default configured as inputs, so they do not need to be explicitly declared as inputs with **pinMode()** when you are using them as inputs. Pins configured this way are said to be in a high-impedance state. Input pins make extremely small demands on the circuit that they are sampling, equivalent to a series resistor of 100 megaohm in front of the pin. This means that it takes very little current to switch the input pin from one state to another. This makes the pins useful for such tasks as implementing a capacitive touch sensor or reading an LED as a photodiode.

Pins configured as pinMode(pin, INPUT) with nothing connected to them, or with wires connected to them that are not connected to other circuits, report seemingly random changes in pin state, picking up electrical noise from the environment, or capacitively coupling the state of a nearby pin.

3.1.1pinMode() Function

The pinMode() function is used to configure a specific pin to behave either as an input or an output. It is possible to enable the internal pull-up resistors with the mode INPUT_PULLUP. Additionally, the INPUT mode explicitly disables the internal pull-ups.

3.1.2pinMode() Function Syntax:

```
Void setup ()
{
pinMode (pin , mode);
}
```

- **pin** − the number of the pin whose mode you wish to set
- **mode** − INPUT, OUTPUT, or INPUT_PULLUP.

3.2 DigitalWrite() Function

The digitalWrite() function is used to write a HIGH or a LOW value to a digital pin. If the pin has been configured as an OUTPUT with pinMode(), its voltage will be set to the corresponding value: 5V (or 3.3V on 3.3V boards) for HIGH, 0V (ground) for LOW. If the pin is configured as an INPUT, digitalWrite() will enable (HIGH) or disable (LOW) the internal pullup on the input pin. It is recommended to set the pinMode() to INPUT_PULLUP to enable the internal pull-up resistor.

If you do not set the pinMode() to OUTPUT, and connect an LED to a pin, when calling digitalWrite(HIGH), the LED may appear dim. Without explicitly setting pinMode(), digitalWrite() will have enabled the internal pull-up resistor, which acts like a large current-limiting resistor.

3.2.1 digitalWrite() Function Syntax

```
Void loop()
 {
   digitalWrite (pin ,value);
}
```

- **pin** − the number of the pin whose mode you wish to set
- **value** − HIGH, or LOW.

3.3 AnalogRead ( ) function

Arduino is able to detect whether there is a voltage applied to one of its pins and report it through the digitalRead() function. There is a difference between an on/off sensor (which detects the presence of an object) and an analog sensor, whose value continuously changes. In order to read this type of sensor, we need a different type of pin.

In the lower-right part of the Arduino board, you will see six pins marked “Analog In”. These special pins not only tell whether there is a voltage applied to them, but also its value. By using the **analogRead()** function, we can read the voltage applied to one of the pins.

This function returns a number between 0 and 1023, which represents voltages between 0 and 5 volts. For example, if there is a voltage of 2.5 V applied to pin number 0, analogRead(0) returns 512.

3.3.1 AnalogRead() function Syntax

analogRead(pin);**pin** − the number of the analog input pin to read from (0 to 5 on most boards, 0 to 7 on the Mini and Nano, 0 to 15 on the Mega)

3.3.2 AnalogReference() Function:

Configures the reference voltage used for analog input (i.e. the value used as the top of the input range). The options are −

- **DEFAULT** − The default analog reference of 5 volts (on 5V Arduino boards) or 3.3 volts (on 3.3V Arduino boards)
- **INTERNAL** − An built-in reference, equal to 1.1 volts on the ATmega168 or ATmega328 and 2.56 volts on the ATmega8 (not available on the Arduino Mega)
- **INTERNAL1V1** − A built-in 1.1V reference (Arduino Mega only)
- **INTERNAL2V56** − A built-in 2.56V reference (Arduino Mega only)
- **EXTERNAL** − The voltage applied to the AREF pin (0 to 5V only) is used as the reference

3.3.3 analogReference() Function Syntax

```
analogReference (type);
```

Type − can use any type of the follow (Default, Internal, Internal1v1, Internal2v56, External) Do not use anything less than 0V or more than 5V for external reference voltage on the AREF pin. If you are using an external reference on the AREF pin, you must set the analog reference to External before calling the analogRead() function. Otherwise, you will short the active reference voltage (internally generated) and the AREF pin, possibly damaging the microcontroller on your Arduino board.

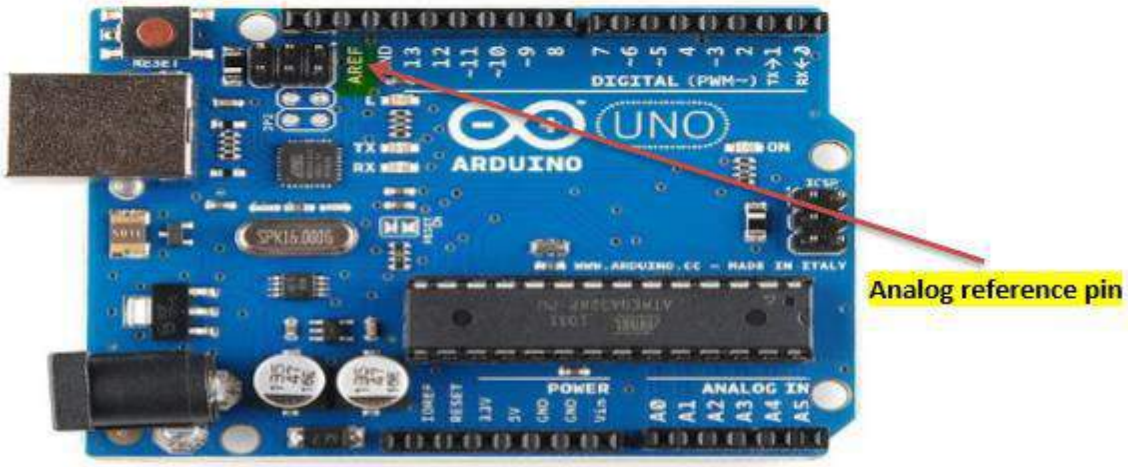

Figure3.1: Arduino UNO Board

Alternatively, you can connect the external reference voltage to the AREF pin through a 5K resistor, allowing you to switch between external and internal reference voltages. Note that the resistor will alter the voltage that is used as the reference because there is an internal 32K resistor on the AREF pin. The two act as a voltage divider. For example, 2.5V applied through the resistor will yield 2.5 * 32 / (32 + 5) = ~2.2V at the AREF pin.

IMPLEMENTATION

4. IMPLEMENTATION

4.1 Hardware Requirements:

We will need the following hardware to accomplish our project.

- ARDUINO UNO.
- WATER LEVEL INDICATOR
- BUZZER
- LED
- JUMPER WIRES

Arduino UNO:

Arduino is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board. The Arduino platform has become quite popular with people just starting out with electronics, and for good reason. Unlike most previous programmable circuit boards, the Arduino does not need a separate piece of hardware (called a programmer) in order to load new code onto the board – you can simply use a USB cable. Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn to program.

Finally, Arduino provides a standard form factor that breaks out the functions of the micro-controller into a more accessible package. The Arduino is a microcontroller board based on the ATmega8. It has 14 digital -input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a ACto-DC adapter or battery to get started .The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter .Revision 2 of the Uno board has a resistor pulling the 8U2HWB line to ground, making it easier to put into DFU mode. Revision of the board has the following new features: Pin out: added SDA and SCL pins that are near to the AREF pin and two other new pins placed near to the RESET pin, the IOREF that allow the shields to adapt to the voltage IOT BASED

 provided from the board. In future, shields will be compatible with both the board that uses the AVR, which operates with 5V and with the Arduino Due that operates with 3.3V. The second one is a not connected pin that is reserved for future purposes. Stronger RESET circuit. AT mega 16U2 replace the 8U2.

"Uno" means one in Italian and is named to mark the upcoming release of Arduino 1.0. The Uno and version 1.0 will be the reference versions of Arduino, moving forward. The Uno is the latest in a series of USB Arduino boards, and the reference model for the Arduino platform.

Figure 4.1: Arduino UNO Board

Water Level Indicator:

A water level indicator is a system that relays information back to a control panel to indicate whether a body of water has a high or low water level. Some water level indicators use a combination of probe sensors or float switches to sense water levels. “The Water Level Indicator employs a simple mechanism to detect and indicate the water level in an overhead tank or any other water container.” according to Electronics Hub.

Figure 4.2: Water Level Sensor

BUZZER:

A buzzer is a device which makes a buzzing or beeping noise. There are several kinds; the most basic is a piezoelectric buzzer, which is just a flat piece of piezoelectric material with two electrodes. This type of buzzer requires some kind of oscillator (or something more complicated like a microcontroller) to drive it—if you apply a DC voltage you will just get a click. They are used in places where you need something that emits an audible tone, but don't care about high-fidelity sound reproduction, like microwave ovens, smoke alarms, and electronic toys. They are cheap and can be very loud without using very much power. They are also very thin, so they can be used in flat objects like "singing" greeting cards.

A piezoelectric element also produces a voltage in response to pressure, so piezoelectric buzzers can also be used as crude pressure sensors or microphones. A similar device, the crystal earpiece, can be used in unpowered crystal radios (now mainly built by hobbyists), because its very high sensitivity means it can be powered by the radio signal itself.

There are also electromechanical buzzers, which use a coil and a moving electrical contact. When the coil is energized, the contact is pulled toward the coil, but this breaks the circuit and the contact rapidly moves back to its original position. This makes a loud buzzing sound. (If you add a gong to this apparatus, you get an electric bell.) You can make a buzzer with an electromechanical relay by connecting the coil and normally-closed contacts in series, although it probably won't be as loud as a purpose-built buzzer. Electromechanical buzzers are (or were) used in alarm systems, doorbells, and school "bells."

Figure 4.3: Buzzer

LED:

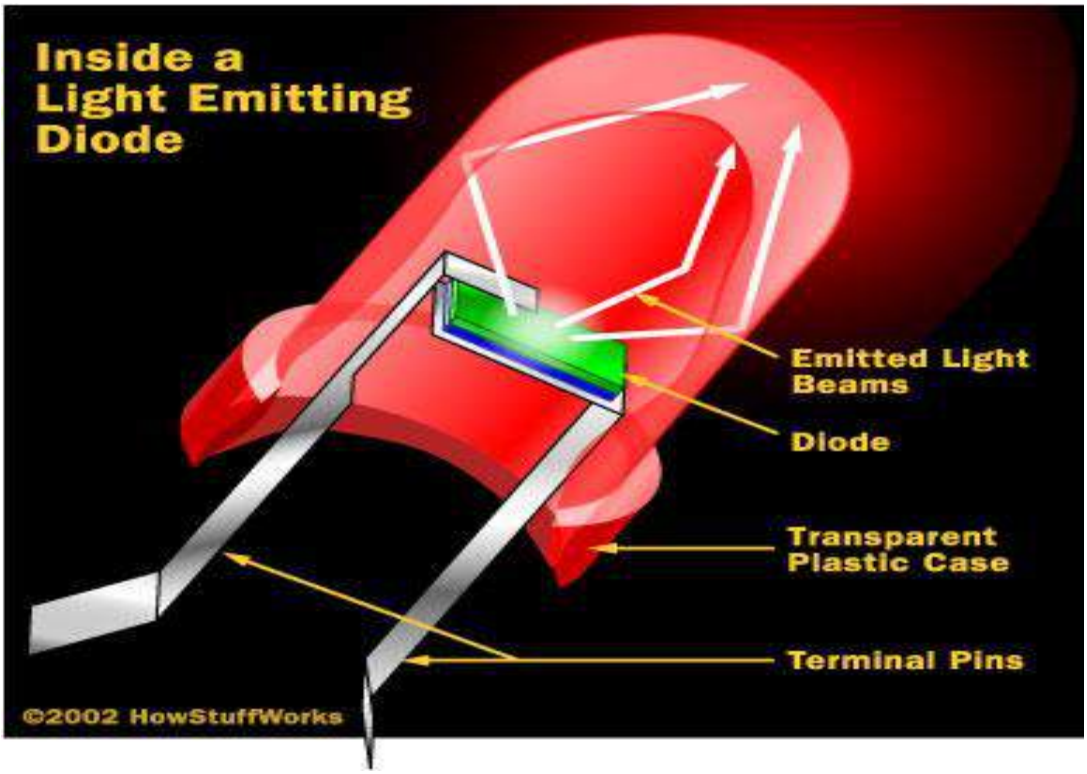

Figure 4.4: Led

The Light emitting diode is a two-lead semiconductor light source. In 1962, Nick Holonyak has come up with an idea of light emitting diode, and he was working for the general electric company. The LED is a special type of diode and they have similar electrical characteristics of a PN junction diode. Hence the LED allows the flow of current in the forward direction and blocks

the current in the reverse direction. The LED occupies the small area which is less than the **1 mm^2**.

The applications of LEDs used to make various electrical and electronic projects. In this article, we will discuss the working principle of the LED and its applications.

The major uses of LED (Light Emitting Diodes) is to illuminate objects and even places. Its application is everywhere due to its compact size, low consumption of energy, extended lifetime and flexibility in terms of use in various applications.

Applications and Uses of LEDs can be seen in:

- TV Backlighting
- Smartphone Backlighting
- LED displays
- Automotive Lighting
- Dimming of lights

The uses and functions of LEDs depend upon the place where it is used, some examples are mentioned below:

Uses of LED in Displays

LEDs display boards are common now these days and are used outdoors like storage signs, billboards, road signs etc. In sign boards which has multiple languages conveying signals, use of more LEDs will be beneficial in terms of less power consumption.

JUMPER WIRES :

A jump wire (also known as jumper wire, or jumper) is a electrical wire, or group of them in a cable, with a connector or pin at each end (or sometimes without them – simply "tinned"), which is normally used to interconnect the components of a breadboard or other prototype or test circuit, internally or with other equipment or components, without soldering.

Individual jump wires are fitted by inserting their "end connectors" into the slots provided in a breadboard, the header connector of a circuit board, or a piece of test equipment.

In this project we have used five jumper wires they are two male & female and three male wires.

Figure 4.5:Jumper Wires

4.2 Purpose of Water Level Indicator

The purpose of a water level indicator is to gauge and manage water levels in a water tank. The control panel can also be programmed to automatically turn on a water pump once levels get too low and refill the water back to the adequate level.

4.2.1Water Level Indicator Sensor?

A water level indicator sensor, also known as a probe sensor, is what tells the control panel that corrective action is needed. A combination of high and low sensors are used to tell the control panel when water levels are too high or too low. The control panel will then automatically turn the pump on or off depending on the corrective action needed.

The working principle of a water level indicator is actually quite simple. Water level indicators work by **using sensor probes** to indicate water levels in a storage tank. These probes send information back to the control panel to trigger an alarm or indicator. As mentioned above, the control panel can be programmed to automatically turn on your pump to refill the water again.

1. The water level is full – Nothing happens
2. Water level drops to the reference probe – Alarm is triggered
3. Fill start is triggered automatically turning on the water to fill the tank
4. Once the water is full, fill stop is triggered and the system automatically stops the pump
5. The system resets and waits for water levels to drop again

Depending on the manufacturer, some water level indicators will have 3 probes while others might have as much as 7.

3 Probe water level indicators use a reference probe, fill start probe and fill stop probe to manage water levels. These probes work together to manage the water levels in a tank. The reference is the lowest point you want the water level to go to before the water starts filling again. The fill start probe is usually the same length as the reference probe to ensure the pump starts filling the water once it has reached its lowest point. 5 probe water level indicators use more probes to also include alarms. They have the same reference probe but also come with a low alarm & high alarm probe that will tell you if water levels become too low or too high.

4.3 Applications of a Water Level Indicator

Water level indicators can be used in Hotels, Pools, Factories, fire protection systems in buildings and more. Other applications and uses of a water level indicator include:

- Hotels
- Home apartments
- Commercial complexes
- Factories
- Where cooling towers are used
- Residential and commercial swimming pools
- Anywhere water levels need to be controlled
- In vehicles as a fuel level indicator
- In huge containers as a liquid level indicator
- Single phase motor
- Single phase submersibles
- Three phase motors
- Open wells

- Bore wells
- Sump Pumps
- Used to start and stop water pumps
- Water level indicator for water tank

4.4 Benefits of Water Level Indicators

- Easy to install
- Very little maintenance
- Compact design
- Automatic water level indicators ensure no overflows or running of dry pumps
- Saves money by using less water and electricity
- Can help avoid seepage of walls and roofs due to tanks overflowing
- Automatic save you can save manual labor time
- Consumes very little energy, perfect for continuous operation
- Shows incitation of water levels in any type of tank

4.5 Sensor Used In a Water Level Indicator

The best sensor to use in a water level indicator is stainless steel probe sensors. Stainless steel sensors prevent rusting, fouling, and deteriorating due to poor water quality. For example, we only use stainless steel sensors in all of our water level sensors. Water level indicators are usually sold as a 2-part system, the control panel, and water level indicator probe sensors. Some water level indicator systems allow up to 6 sensing probes, while others only allow 2 depending on the configuration you need.

4.5.1 Importance of Water Level Indicators

Water level indicators are important for many different industries. For example, cooling towers use water level indicators to monitor water levels in a tank and make corrective actions based on the level of water. Without water level indicators in a water tank, you would have to manually check whether enough water is in the tank, and should your tank ever go empty, it could mean

your chiller overheating. Water level indicators allow you to remotely monitor water levels and make corrective actions automatically so you can focus on more important issues.

4.6 Water Level Indicator Advantages

Water level indicator advantages include:

- Power Saver
- Money Saver
- Automatic
- Water Maximization
- Reliable Electronic Design

4.7 Water Level Indicator Disadvantages

Water level indicator disadvantages include:

- Water level controls need to be replaced every 3 years.
- The rust, foul and deteriorate
- Electronics are usually built seperately
- More difficult installation
- Most float switches are outdated
- No LED indicator lights
- No Warranty or Guarantee

4.8 Hardware Implementation:

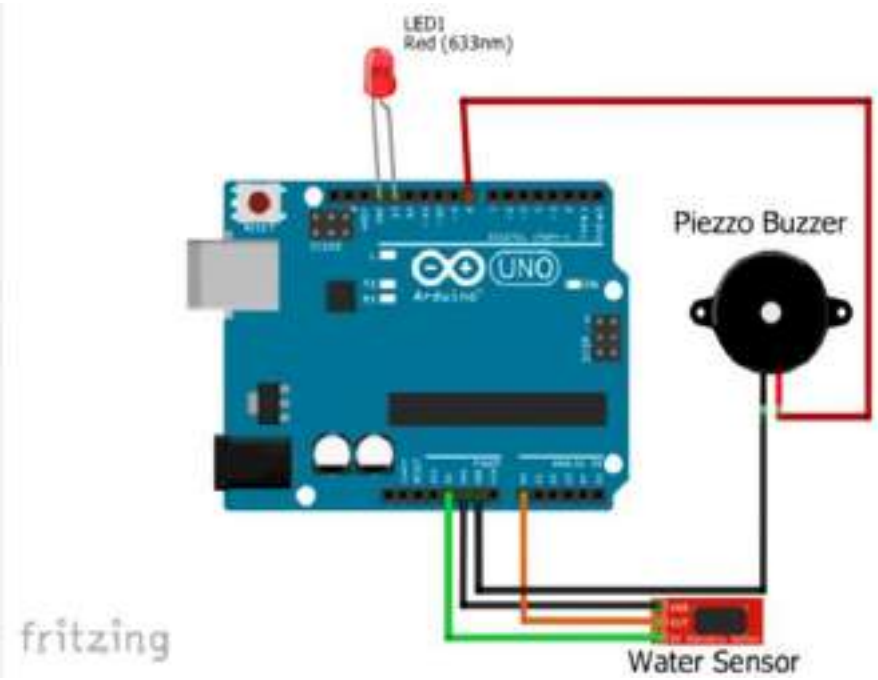

Figure 4.6: Circuit Diagram of Water Level Indicator

This simple transistor based water level indicator circuit is very useful to indicate the water levels in a tank. Whenever tank gets filled, we get alerts on particular levels. Here we have created 4 levels (low, medium, high and full), we can create alarms for more levels. We have added 3 LEDs to indicate initial three levels (A, B, C), and one Buzzer to indicate FULL level (D). When tanks gets filled completely we get beep sound from Buzzer.

Sample Code:

```
int adc_id = A0;
int HistoryValue = 0;
char printBuffer[128];
int ledPin = 13;
const int buzzerPin = 8;

void setup()
{
  pinMode(buzzerPin, OUTPUT);
```

```
  pinMode(ledPin,OUTPUT);
  Serial.begin(9600);
}

void loop()
{
   int value = analogRead(adc_id); // get adc value

   if(((HistoryValue>=value) && ((HistoryValue - value) > 10)) || ((HistoryValue<value) &&
((value - HistoryValue) > 10)))
   {
     sprintf(printBuffer,"ADC%d level is %d\n",adc_id, value);
     Serial.print(printBuffer);
     if (value > 280)
     {
       tone(buzzerPin, 100,1000);
   digitalWrite(ledPin, HIGH);
   delay(100);

   noTone(buzzerPin);
   digitalWrite(ledPin, LOW);
   delay(100);
   Serial.println("----------- ALARM ACTIVATED -----------");
     }
     else
    {
   noTone(buzzerPin);
   digitalWrite(ledPin, LOW);
       }
     HistoryValue = value;
   }
```

```
}
```

CONCLUSION

5. CONCLUSION

The water level Indicator employs a simple mechanism to detect and indicate the water level in an overhead tank or any other water container. The sensing is done by using a set of four probes which are placed at four different levels. It can be concluded that this system is very beneficial in rural as well as urban areas. It helps in the efficient utilization of available water sources. If used on a large scale, it can provide a major contribution in the conservation of water for us and the future generations. In these days, when the Earth's reserve of consumable water is decreasing every moment, every drop has its value. Water level controller is a simple yet effective way to prevent wastage of water. Its simplicity in design and low cost components make it an ideal piece of technology for the common man. The proposed method is

- Simple,
- Easy to use,
- Easy to install,
- Available for all having the Arduino and sensor,

In future, this circuit can be upgraded with some sensor which can automatically stop the power supply of the driving pump or motor or manually stopping the motor by sending a text message to the user through Cloud.

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4. Source code/sketch: https://drive.google.com/open?id=0B61 …
5. Wiring diagram: https://drive.google.com/open?id=0B61 …

A PROJECT REPORT
ON
SMART DUSTBIN

A Project Report submitted in partial fulfillment of requirement
for the award of the degree of Bachelor of Science
B.Com Computer Applications

Submitted by

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Project Guide **Head of the Department** **Principal** **External Examiner**

PRINCIPAL (FAC)
A.S.D. GOVT. DEGREE COLLEGE FOR (W)
KAKINADA.

A PROJECT REPORT
ON
EYE BLINK SENSOR

A Project Report submitted in partial fulfillment of requirement
for the award of the degree of Bachelor of Science
B.Com Computer Applications

Submitted by

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DEPARTMENT OF COMPUTER SCIENCE
A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN
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Affiliated to Adikavi Nannaya University, Rajamahendravaram
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2019-2020

A.S.D. GOVT. DEGREE COLLEGE FOR WOMEN (A)
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A PROJECT REPORT
ON
AUTOMATIC WATER DISPENSER

A Project Report submitted in partial fulfillment of requirement
for the award of the degree of Bachelor of Science
B.Com Computer Applications

Submitted by

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A PROJECT REPORT
ON
AUTOMATIC STREET LIGHT

A Project Report submitted in partial fulfillment of requirement
for the award of the degree of Bachelor of Science
B.Com Computer Applications

Submitted by

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DECLARATION

We hereby declare that the project work entitled "AUTOMATIC STREET LIGHT", submitted to the A.S.D.GOVT. DEGREE COLLEGE WOMEN (A) KAKINADA, is a record of an original work done by us under the guidance of Mrs.N.Naga Subrahmanyeswari, Head of the Dept. of ComputerScience and this project work is submitted in the partial fulfillment of the requirements for the award of Degree of B.com (Computer applications).The results embodied in this report have not been submitted to any other University or Institute for the award of any degree or diploma.

Name of the Member	**Signature**
B.Venkata Ramya	
A.Lakshmi syamala	
P.Alekhya	
Ch.Mounika	
D.Kanchana	
Y.Thirumala Ramani	

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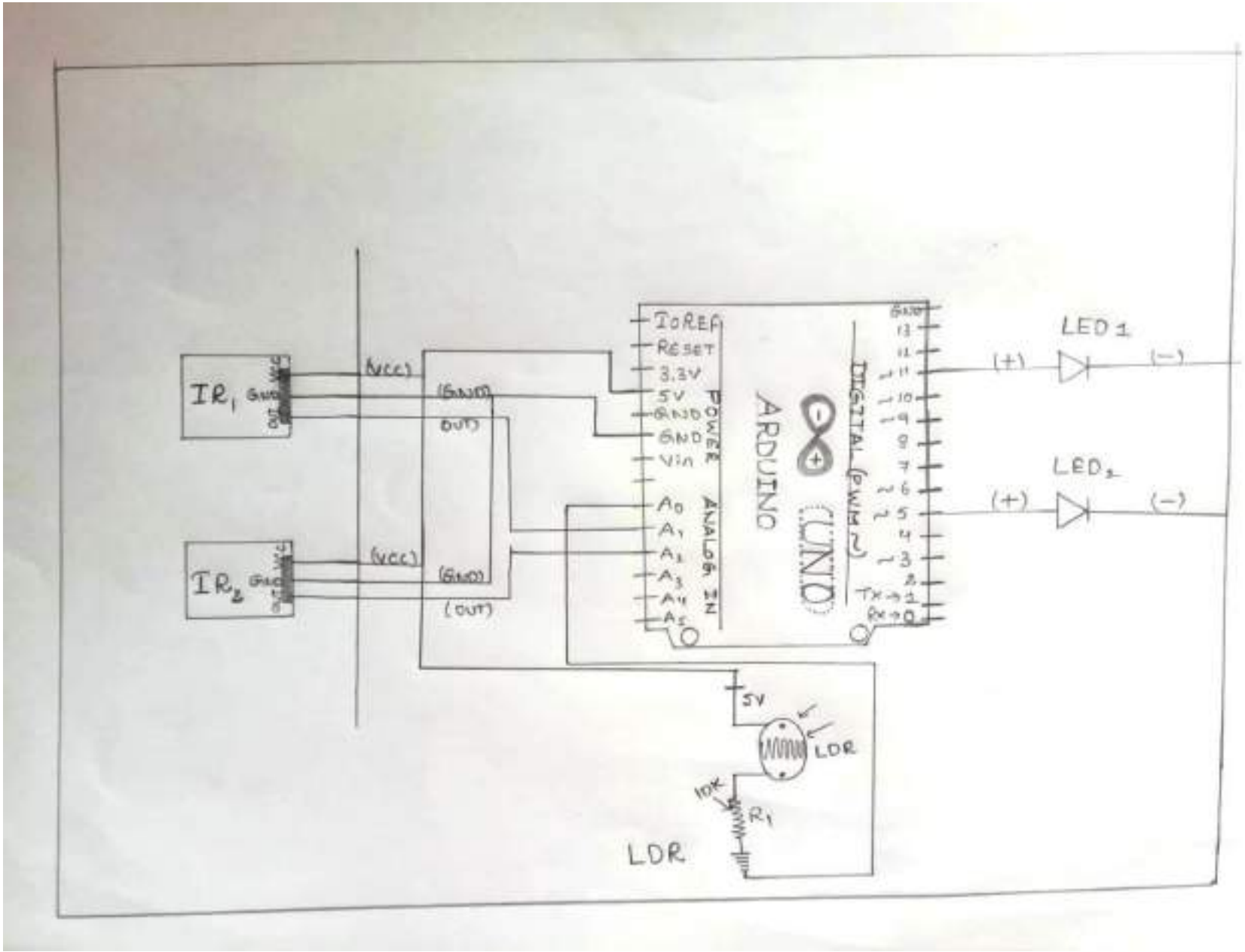
CIRCUTE DIAGRAM



ABSTRACT

Automatic Street Light Control System is a simple yet powerful concept, which uses transistor as a switch. By using this system manual works are 100% removed. It automatically switches ON lights when the object goes below the visible region of our eyes. This is done by a sensor called Light Dependent Resistor (LDR) which senses the light actually like our eyes. It automatically switches OFF lights whenever the object comes, visible to our eyes. By using this system energy consumption is also reduced because nowadays the manually operated street lights are not switched off even the object comes. In this project, no need of manual operation like ON time and OFF time setting. This project clearly demonstrates the working of transistor in saturation region and cut-off region.

- Low cost
- Automated operation
- Low power consumption
- Very flexible
- Easy to manufactured

2. INTRODUCTION

2.1 INTERNET OF THINGS (IOT)

The **Internet of things** (**IOT**) is a system of interrelated computing devices, mechanical and digital machines are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. The definition of the Internet of things has evolved due to the convergence of multiple technologies, real-time analytics, machine_learning, commodity sensors, and systems. Traditional fields of embedded systems, wireless_sensor_networks, control_systems, automation (including home and building automation), and others all contribute to enabling the Internet of things. In the consumer market, IOT technology is most synonymous with products pertaining to the concept of the "smart home", covering devices and appliances (such as lighting fixtures, thermostats, home security systems and cameras, and other home appliances) that support one or more common ecosystems, and can be controlled via devices associated with that ecosystem, such as smartphones and smart speakers. The connections allow each thing to collect and exchange data, and we can control them remotely or by setting rules or chains of actions. IOT improves the ease of life of humans and their daily activities. Experts estimate that the IOT will consist of almost 50 billion objects by 2020. Examples where the internet of things has become reality:

- Many postal companies offer tracking codes that offer customers the ability to check the status of their package in real time.
- Modern printers offer the option to order new ink cartridges when it runs out. The printer can easily query how much ink or toner is left in a cartridge and order a new one once it starts to run out or becomes empty.
- Smart doorbells that offer a real-time video feed of your front door to prevent trespassing and provides an extra layer of security for residents when or when they are not at home.
- Smart thermometers like Nest that uses AI to learn your personal habits at home to monitor and control the temperature to make your living as comfortable as possible while also keeping the electricity cost low.
- One of the most popular IOT devices known as Amazon echo is a small device where you are able to interact to help improve your living conditions. It is able to help turn on your coffee machine, play songs, turn on lights, and much more.

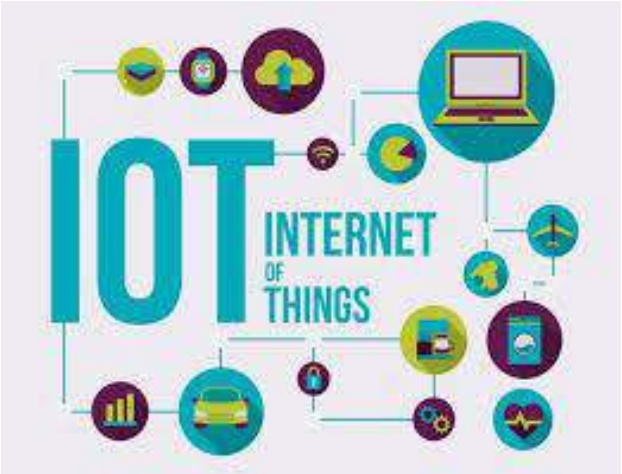


Fig.2.0 internet of things

2.2 Advantages of IOT

- Communication. **IOT** encourages the communication between devices, also famously known as Machine-to-Machine (M2M) communication
- Automation and Control
- Information
- Monitor
- Time
- Money
- Automation of daily tasks leads to better monitoring of devices
- Efficient and Saves Time.

2.3 *AUTOMATIC STREET LIGHT*

INTRODUCTION

A **street light**, **light pole**, **lamppost**, **street lamp**, **light standard** or **lamp standard** is a raised source of light on the edge of a road or path. When urban electric power distribution became ubiquitous in developed countries in the 20th century, lights for urban streets followed, or sometimes led. Many lamps have light-sensitive photocells that activate the lamp automatically when needed, at times when there is little to no ambient light, such as at dusk, dawn, or at the onset of dark weather conditions. This function in older lighting systems could be performed with the aid of a solar dial. Many street light systems are being connected underground instead of wiring from one utility post to another.

Fig.2.1

2.4 HISTORY

DUSTRIAL ERAPRE IN

Early lamps were used by Greek and Roman civilizations, where light primarily served the purpose of security, both to protect the wanderer from tripping on the path over something or keeping the potential robbers at bay. At that time oil lamps were used predominantly as they provided a long-lasting and moderate flame. A slave responsible for lighting the oil lamps in front of Roman villas was called a *lanternarius*.

Fig: 2.2

The use of street lighting was first recorded in the city of Antioch from the 4th century B.C.Later it was recorded in the Caliphate of Córdoba from the 9th–10th centuries, especially in Cordova. In the middle Ages, so-called "link boys" escorted people from one place to another through the murky winding streets of medieval towns. Before incandescent lamps, candle lighting was employed in cities. The earliest lamps required that a lamplighter tour the town at dusk, lighting each of the lamps. According to some sources, illumination was ordered in London in 1417 by Sir Henry Barton, Mayor of London though there is no firm evidence of this. Public street lighting was first developed in the 1500s, and accelerated following the invention of lanterns with glass windows, which greatly improved the quantity of light.

In 1588 the Parisian Parliament decreed that a torch be installed and lit at each intersection, and in 1594 the police changed this to lanterns. Still, in the mid-1600s it was a common practice for travelers to hire a lantern-bearer if they had to move at night through the dark, winding streets. King Louis XIV authorized sweeping reforms in Paris in 1667, which included the installation and maintenance of lights on streets and at intersections, as well as stiff penalties for vandalizing or stealing the fixtures.

Fig: 2.3

Paris had more than 2,700 street lights by the end of the 17th century, and twice as many by 1730. Under this system, streets were lit with lanterns suspended 20 yards (18 m) apart on a cord over the middle of the street at a height of 20 feet (6.1 m); as an English visitor enthused in 1698, 'The streets are lit all winter and even during the full moon!

In London, public street lighting was implemented around the end of the 17th century; a diarist wrote in 1712 that ‘All the way, quite through Hyde Park to the Queen’s Palace at Kensington, lanterns were placed for illuminating the roads on dark nights.’

A much-improved oil lantern, called a *réverbère*, was introduced in 1745 and improved in subsequent years. The light shed from these reversers was considerably brighter, enough that some people complained of glare. These lamps were attached to the top of lampposts; by 1817, there were 4694 lamps on the Paris streets.[*citation needed*] During the French Revolution (1789–1799), the revolutionaries found that the lampposts were a convenient place to hang aristocrats and other opponent

Incandescent lighting

Fig: 2.4

Map of Tamworth, New South Wales, showing the position of leads and lights along the network of city streets in 1888The First Street to be lit by an incandescent light bulb was Mosley Street, in Newcastle upon Tyne. The street was lit for one night by Joseph Swan's incandescent lamp on 3 February 1879. Consequently, Newcastle has the first city street in the world to be lit by electric lighting.

The first city in the United States to successfully demonstrate electric lighting was Cleveland, Ohio with 12 electric lights around the Public Square road system on 29 April 1879. Wabash, Indiana lit 4 Brush arc lamps with 3,000 candlepower each, suspended over their courthouse on 2 February 1880, making the town square "as light as midday". Kimberley, Cape Colony (modern South Africa), was the first city in the Southern Hemisphere and in Africa to have electric street lights - with 16 first lit on 2 September 1882. In Central America, San Jose, Costa Rica lit 25 lamps powered by a hydroelectric plant on 9 August 1884.

Nurnberg was the first city in Germany to have electric public lighting on 7 June 1882, followed by Berlin on 20 September 1882 (Potsdam Plats only).Timisoara, in present-day Romania,

was the first city in the Austrian-Hungarian Monarchy to have electric public lighting on 12 November 1884; 731 lamps were used.

In 1886, the tiny, isolated mining town of Warpath in NW Tasmania was the first to have electrically powered street lighting in Australia. On 9 December 1882; Brisbane, Queensland, Australia was introduced to electricity by having a demonstration of 8 arc lights, erected along Queen Street Mall. The power to supply these arc lights was taken from a 10 hp Crompton DC generator driven by a Robey steam engine in a small foundry in Adelaide Street and occupied by J. W. Sutton and Co. The lamps were erected on cast iron 20 ft. (6.1 m) standards.

In 1884 Walhalla, Victoria, Victoria, Australia became the first city in the Southern Hemisphere to have permanent Electric Street lighting when a limited system was installed along the main street by the Long Tunnel (Gold) Mining Company.

Four years later in 1888 the New South Wales town of Tamworth installed a large system illuminating a significant portion of the city, with over 13 km of streets lit by 52 incandescent lights and 3 arc lights, for which that city maintains the title of "First City of Light".

2.5 Later developments

Incandescent lamps were primarily used for street lighting until the advent of high-intensity gas-discharge lamps. They were often operated at high-voltage series circuits. Series circuits were popular since their higher voltage produced more light per watt consumed. Furthermore, before the invention of photoelectric controls, a single switch or clock could control all the lights in an entire district. Intact, Early series street lights were equipped with isolation transformers. That would allow current to pass across the transformer whether the bulb worked or not. Later the film cutout was invented. This was a small disk of insulating film that separated two contacts connected to the two wires leading to the lamp. If the lamp failed (an open circuit), the current through the string became zero, causing the voltage of the circuit (thousands of volts) to be imposed across the insulating film, penetrating it (see Ohm's law). In this way, the failed lamp was bypassed and power restored to the rest of the district.

The street light circuit contained an automatic current regulator, preventing the current from increasing as lamps burned out, preserving the life of the remaining lamps. When the failed lamp was replaced, a new piece of film was installed, once again separating the contacts in the cutout. This system was recognizable by the large porcelain insulator separating the lamp and reflector from the mounting arm. This was necessary because the two contacts in the lamp's base may have operated at several thousand volts above ground.

2.6 Modern lights

The distinctive amber-yellow glow from an old-style low-pressure sodium vapor light in the UK

Fig: 2.5 sodium vapor light

Fig: 2.5.1 an unlit high-pressure sodium lamp

Today, street lighting commonly uses high-intensity discharge lamps. Low-pressure sodium lamps became commonplace after World War II for their low power consumption and long life. Late in the 20th century HPS high pressure sodium lamps were preferred, taking further the same virtues. Lamps provide the greatest amount of photo pic illumination for the least consumption of electricity

However, white light sources have been shown to double driver peripheral vision and improve driver brake reaction time by at least 25%; to enable pedestrians to better detect pavement trip hazards and to facilitate visual appraisals of other people associated with interpersonal judgments. Studies comparing metal halide and high-pressure sodium lamps have shown that at equal photo pic light levels, a street scene illuminated at night by a metal halide lighting system was

reliably seen as brighter as and safer than the same scene illuminated by a high pressure sodium system. Two national standards now allow for variation in illuminance when using lamps of different spectra. In Australia, HPS lamp performance needs to be reduced by a minimum value of 75%. In the UK, illuminances are reduced with higher values S/P ratio. New street lighting technologies, such as LED or induction lights, emit a white light that provides high levels of scotopic lumens allowing street lights with lower wattages and lower photopic lumens to replace existing street lights. However, there have been no formal specifications written around Photopic/Scotopic adjustments for different types of light sources, causing many municipalities and street departments to hold back on implementation of these new technologies until the standards are updated. Eastbound in East Sussex UK is currently undergoing a project to see 6000 of its street lights converted to LED and will be closely followed by Hastings in early 2014. Milan, Italy, is the first major city to have entirely switched to LED lighting.

In North America, the city of Mississauga (Canada) was one of the first and biggest LED conversion projects with over 46,000 lights converted to LED technology between 2012 and 2014. It is also one of the first cities in North America to use Smart City technology to control the lights. DimOnOff, a company based in Quebec City, was chosen as a Smart City partner for this project. Photovoltaic-powered LED luminaires are gaining wider acceptance. Preliminary field tests show that some LED luminaires are energy-efficient and perform well in testing environments. In 2007, the Civil Twilight Collective created a variant of the conventional LED streetlight, namely the Lunar-resonant streetlight. These lights increase or decrease the intensity of the streetlight according to the lunar light. This streetlight design thus reduces energy consumption as well as light pollution

2.1MESUREMENT

Fig: 2.6

Old-style Street light with lamps near the Mönchbruch hunting lodge near Rüsselsheim am Main, Germany

Fig 2.7A Street light during a snowfall

Two very similar measurement systems were created to bridge the scotopic and photopic luminous efficiency functions, creating a Unified System of Photometry. This new measurement has been well-received because the reliance on V (λ) alone for characterizing night-time light illuminations requires more electric energy. The cost-savings potential of using a new way to measure metopic lighting scenarios is tremendous. Outdoor Site-Lighting Performance (OSP) is a method for predicting and measuring three different aspects of light pollution: glow, trespass and glare. Using this method, lighting specifies can quantify the performance of existing and planned lighting designs and applications to minimize excessive or obtrusive light leaving the boundaries of a property.

2.8 Advantages

Major advantages of street lighting include prevention of accidents and increase in safety. Studies have shown that darkness results in a large number of crashes and fatalities, especially those involving pedestrians; pedestrian fatalities are 3 to 6.75 times more likely in the dark than in daylight. Several decades ago when automobile crashes were far more common, street lighting was found to reduce pedestrian crashes by approximately 50%.Furthermore, in the 1970s, lighted intersections and highway interchanges tend to have fewer crashes than unlighted intersections and interchanges. Lighting also reduces crime. Towns, cities, and villages use the unique locations provided by lampposts to hang decorative or commemorative banners. Many communities in the US use lampposts as a tool for fund raising via lamppost banner sponsorship programs first designed by a US based lamppost banner manufacturer.

A number of street light control systems have been developed to control and reduce energy consumption of a town's public lighting system. These range from controlling a circuit of street

lights and/or individual lights with specific ballasts and network operating protocols. These may include sending and receiving instructions via separate data networks, at high frequency over the top of the low voltage supply or wireless. Street light controllers are smarter versions of the mechanical or electronic timers previously used for street light ON-OFF operation. They come with energy conservation options like twilight saving, staggering or dimming. Also many street light controllers come with an astronomical clock for a particular location or a Global Positioning System (GPS) connection to give the best ON-OFF time and energy saving.

2.9 Accessories

Some intelligent street light controllers also come with Global System for Mobile Communications (GSM), Radio frequency (RF) or General Packet Radio Service (GPRS) communication, user adjusted according to latitude and longitude (low cost type), for better street light management and maintenance. Many street light controllers also come with traffic sensors to manage the lux level of the lamp according to the traffic and to save energy by decreasing lux when there is no traffic. The United States, Canada, India, and many other countries have started introducing street light controllers to their road lighting for energy conservation, street light management and maintenance purpose.

2.10 Economics

Street light controllers can be expensive in comparison with normal timers, and can cost between $100 and $2,500, but most of them return the investment between 6 months and 2 years. As the equipment's lifetime is 7 to 10 years it saves energy and cost for some years.

2.11 Image-based street light control

A number of companies are now manufacturing intelligent street lighting that adjust light output based on usage and occupancy, i.e. automating classification of pedestrian versus cyclist, versus automobile, sensing also velocity of movement and illuminating a certain number of streetlights ahead and fewer behind, depending on velocity of movement. Also the lights adjust depending on road conditions, for example, snow produces more reflectance therefore reduced light is required.

2.12 Purpose

There are three distinct main uses of street lights, each requiring different types of lights and placement. Using the wrong types of lights can make the situation worse by compromising visibility or safety.

2.13 Beacon lights

Decorative but functional lamps in the Plaza at sunset, Samaipata, BoliviaA modest steady

light at the intersection of two roads is an aid to navigation because it helps a driver see the location of a side road as they come closer to it, so that they can adjust their braking and know exactly where to turn if they intend to leave the main road or see vehicles or pedestrians. A beacon light's function is to say "here I am" and even a dim light provides enough contrast against the dark night to serve the purpose. To prevent the dangers caused by a car driving through a pool of light, a beacon light must never shine onto the main road, and not brightly onto the side road. In residential areas, this is usually the only appropriate lighting, and it has the bonus side effect of providing spill lighting onto any sidewalk there for the benefit of pedestrians. On Interstate highways this purpose is commonly served by placing reflectors at the sides of the road.

2.14 Roadway lights

Fig: 2.8 High-mast lighting along Highway 401 in Ontario, Canada

Fig: 2.9

Conventional streetlights are used instead of high-mast lighting near airport runway approaches due to the negative effects caused by the latter. Because of the dangers discussed above,

roadway lights are properly used sparingly and only when a particular situation justifies increasing the risk. This usually involves an intersection with several turning movements and much signage, situations where drivers must take in much information quickly that is not in the headlights' beam. In these situations (a freeway junction or exit ramp), the intersection may be lit so that drivers can quickly see all hazards, and a well-designed plan will have gradually increasing lighting for approximately a quarter of a minute before the intersection and gradually decreasing lighting after it. The main stretches of highways remain unlighted to preserve the driver's night vision and increase the visibility of oncoming headlights. If there is a sharp curve where headlights will not illuminate the road, a light on the outside of the curve is often justified. If it is desired to light a roadway (perhaps due to heavy and fast multi-lane traffic), to avoid the dangers of casual placement of street lights, it should not be lit intermittently since this requires repeated eye readjustment, which causes eyestrain and temporary blindness when entering and leaving light pools. In this case, the system is designed to eliminate the need for headlights. This is usually achieved with bright lights placed on high poles at close regular intervals so that there is consistent light along the route.

CYCLE PATH LIGHTS

Fig 2.10 safe cycling with a dedicated bicycle path with street lights in London

2.15 Maintenance

Fig: 2.11 New York City fire alarm pull box indicator mounted on street light

Street lighting systems require ongoing maintenance, which can be classified as either reactive or preventative. Reactive maintenance is a direct response to a lighting failure, such as replacing a discharge lamp after it has failed, or replacing an entire lighting unit after it has been hit by a vehicle. Preventative maintenance is scheduled replacement of lighting components, for example replacing all of the discharge lamps in an area of the city when they have reached 85% of their expected life. In the United Kingdom the Roads Liaison Group has issued a Code of Practice recommending specific reactive and preventative maintenance procedures. Some street lights in New York City have an orange or red light on top of the luminaire (light fixture) or a red light attached to the lamppost. This indicates that near to this lighting pole or in the same intersection, there is a fire alarm pull box.[68] Other street lights have a small red light next to the street light bulb; when the small light flashes, it indicates an issue with the electrical current.

2.16 Main *manufacturers*

Australia

- GEC (General Electric)
- Osama Sylvania
- Philips
- Thorn Lighting
- Westinghouse

North America

- American Electric Lighting (formerly ITT, later Thomas & Betts), US
- Cooper Lighting division of Cooper Industries, US
- General Electric, US
- Osram Sylvania, US
- Westinghouse Lighting Corporation (formerly Angelo Brothers) division of the new Westinghouse Electric, US

Europe

- CU Phosco Lighting, United Kingdom
- Trilux, Germany
- Osram, Germany
- Philips, the Netherlands
- Siemens, Germany
- Svetlana AD, Bulgaria
- Thorn Lighting formerly Europhile, United Kingdom
- GEC, United Kingdom & Hungary
- Philips, United Kingdom
- Schrader, Belgium

Asia

- Matsushita Electric Industrial Co., Japan
- Sanyo, Japan
- Bajaj Electricals, India
- K-Lite Industries, India

Fig: 2.12A historical Slovak lamppost

Fig: 2.13 German streetlight at night

Fig: 2.14 Street light from the 1950s attached to a utility pole in New Jersey

Fig: 2.15 Polish street lights from the 1930s

3. LITERATURE REVIEW

Automatic street light system is a simple concept which uses transistor as a switch. By this system manual works are completely removed. It automatically switches on lights when the light goes below ambient light. This is done using LDR which senses the light.

Fig.3 Automatic Street light

Saving electrical power is very important, instead of using the power in unnecessary times it should be switched off when not in use. In any city "Street Light" is one of the major power consuming factors. Most of the time, street lights are during all night long until the sunrise.

A large amount of energy and power has been wasted when it is not needed. In this project, Light dependent Resistor and Infrared addition sensor will be used for our Automatic Street Light which to ensure this system will save the power consumption. Automatic Street Light will only wor'swhen it is dare' and the lamp will only glow when there is a vehicle on the road. Street light will depends on the sensor used which sensor to detect the vehicle movements on the road. If the Is sensors detecting a motion on the road the lights will automatically turned and if there is no motion on the road the light will be turned. Automatic Street Light system. Also would not war's during day time even though there is a motion on the road because it has been used in the circuit which to detect the object.

4. METHODOLOGY

This paper proposes an effective scheme for controlling the wastage of electricity due to street lights. It reduces the manual effort by automatic the street light on the basis of light intensity. The electricity wastage can be reduced by glowing the light on the bases of moment detection. Here three parts have been included under this topic for completed this study. Deign architecture is the main block function for the proposed designed while the hardware's specification will detail out the components involved in the design from the sensor components until the controller selection. Software development based on the proposed designed will be detail outing software part where the flow of the system operation will be detailed out elaborated.

The literature review clearly indicates the gap in literature of conventional method of street light control. This motivated the proposed study wherein, the need for cost efficient and power efficient method of automatic street light control is necessary. Aim: To design and implement automatic street light control system using light dependent resistor.Objectives:1)To study the existing street light control systems.2)To design energy efficient street light control system.3)To develop the hardware of control unit.4)To test and validate the designed system.Methodology:Methodology for objective1:•Literature survey will be made to understand the existing street light control systems and their limitations. Methodology for objective2:•The control unit will be designed according to the specifications. The designed control circuit will be simulated using multiuse and its characteristics will be observe he design will be refined to get the desired characteristics and retested using multisim.

5. SYSTEM DESIGN AND IMPLEMENTATION

REQUIREMENTS TO BE USED	QUANTITY
Arduino Uno	1
Bread Board	1
Infrared Radiations Sensors (IR)	2
Light Emitting Diode (Led)	2
Light Dependent Resistor (LDR)	1
10k Resistors	2
Jumper Wires (M To M , F To F ,M To F)	as per your required
Black Sheets	1
Clip Board	1
Black Tape	2
Yellow Sheet	4
Straws	2
Thermocol Sheets	1
plywood	1

5.1 ARDUINO UNO

ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The board has 14 digital I/O pins (six capable of PWM output), 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment), via a type B USB cable. It can be powered by the USB cable or by an external 9-volt battery, though it accepts voltages between 7 and 20 volts. It is also similar to the Arduino Nano and Leonardo. The hardware reference design is distributed under a Creative Commons Attribution Share-Alike 2.5 license and is available on the Arduino website. Layout and production files for some versions of the hardware are also available. The word "Uno" means "one" in Italian and was chosen to mark the initial release of Software. The Uno board is the first in a series of USB-based Arduino boards; it and version 1.0 of the Arduino IDE were the reference versions of Arduino, which have now evolved to newer releases. The ATmega328 on the board comes preprogrammed with a boot loader that allows uploading new code to it without the use of an external hardware programmer. While the Uno communicates using the original STK500 protocol, it differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it uses the Atmega16U2

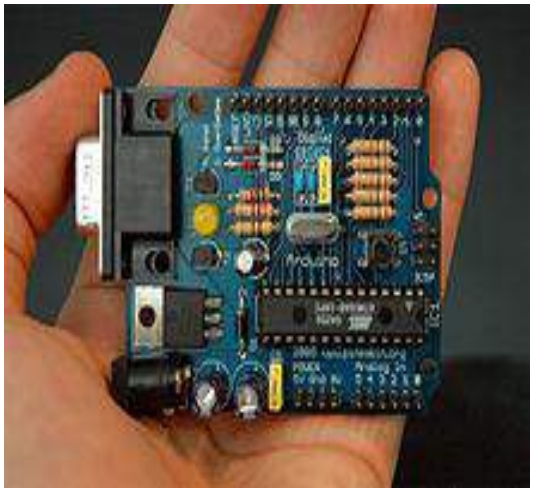
Fig:5.1ArduinoUno Board

5.1.1Contents

- 1 Background
- 2 Technical specifications
- 3 Pins
    - 3.1 General pin functions

❖ Background

The Arduino project started at the Interaction Design Institute Vireo (IDII) in Vireo, Italy. At that time, the students used a BASIC Stamp microcontroller, at a cost that was a considerable expense for many students. In 2003, Hernando Barraging created the development platform wiring as a Master's thesis project at IDII, under the supervision of Massimo Benzie and Casey Rears, who are known for work on the Processing language. The project goal was to create simple, low-cost tools for creating digital projects by non-engineers. The Wiring platform consisted of a printed circuit board (PCB) with an ATmega168 microcontroller, an IDE based on Processing, and library functions to easily program the microcontroller. In 2003, Massimo Benzie, with David Millis, another IDII student, and David Cuartielles, added support for the cheaper ATmega8 microcontroller to Wiring. But instead of continuing the work on Wiring, they forked the project and renamed it Arduino. Early Arduino boards used the FTDI USB-to-serial driver chip and an ATmega168.The Uno differed from all preceding boards by featuring the ATmega328P microcontroller and an ATmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter.



❖ Technical specifications

- Microcontroller: Microchip ATmega328P
- Operating Voltage: 5 Volts

- Input Voltage: 7 to 20 Volts
- Digital I/O Pins: 14 (of which 6 can provide PWM output)
- Analog Input Pins: 6
- DC Current per I/O Pin: 20 mA
- DC Current for 3.3V Pin: 50 mA
- Flash Memory: 32 KB of which 0.5 KB used by boot loader
- SRAM: 2 KB
- EEPROM: 1 KB
- Clock Speed: 16 MHz
- Length: 68.6 mm
- Width: 53.4 mm
- Weight: 25 g

❖ ***Pins***

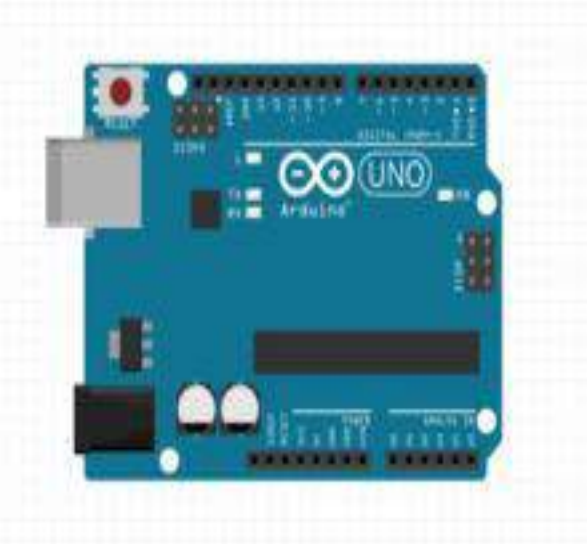


Fig: 5.3 Arduino UNO

General pin functions:

- LED: There is a built-in LED driven by digital pin 13. When the pin is high value, the LED is on, when the pin is low, it is off.
- VIN: The input voltage to the Arduino/Genuino board when it is using an external power source (as opposed to 5 volts from the USB connection or other regulated power source). You can supply voltage through this pin, or, if supplying voltage via the power jack, access it through this pin.

- 5V: This pin outputs a regulated 5V from the regulator on the board. The board can be supplied with power either from the DC power jack (7 - 20V), the USB connector (5V), or the VIN pin of the board (7-20V). Supplying voltage via the 5V or 3.3V pins bypasses the regulator, and can damage the board.
- 3V3: A 3.3 volt supply generated by the on-board regulator. Maximum current draw is 50 mA.
- GND: Ground pins.
- IOREF: This pin on the Arduino/Genuino board provides the voltage reference with which the microcontroller operates. A properly configured shield can read the IOREF pin voltage and select the appropriate power source, or enable voltage translators on the outputs to work with the 5V or 3.3V.
- Reset: Typically used to add a reset button to shields that block the one on the board.

❖ Special pin functions:

Each of the 14 digital pins and 6 analog pins on the Uno can be used as an input or output, under software control (using pin Mode (), digital Write (), and digital Read() functions). They operate at 5 volts. Each pin can provide or receive 20 mA as the recommended operating condition and has an internal pull-up resistor (disconnected by default) of 20-50K ohm. A maximum of 40mA must not be exceeded on any I/O pin to avoid permanent damage to the microcontroller. The Uno has 6 analog inputs, labeled A0 through A5; each provides 10 bits of resolution (i.e. 1024 different values). By default, they measure from ground to 5 volts, though it is possible to change the upper end of the range using the AREF pin and the analog Reference () function. In addition, some pins have specialized functions:

- Serial / UART: pins 0 (RX) and 1 (TX). Used to receive (RX) and transmit (TX) TTL serial data. These pins are connected to the corresponding pins of the ATmega8U2 USB-to-TTL serial chip.
- External interrupts: pins 2 and 3. These pins can be configured to trigger an interrupt on a low value, a rising or falling edge, or a change in value.
- PWM (pulse-width modulation): pins 3, 5, 6, 9, 10, and 11. Can provide 8-bit PWM output with the analog Write () function.
- SPI (Serial Peripheral Interface): pins 10 (SS), 11 (MOSI), 12 (MISO), and 13 (SCK). These pins support SPI communication using the SPI library.

- TWI (two-wire interface) / I²C: pin SDA (A4) and pin SCL (A5). Support TWI communication using the Wire library.
- AREF (analog reference): Reference voltage for the analog inputs.

❖ Communication

The Arduino/Genuino Uno has a number of facilities for communicating with a computer, another Arduino/Genuino board, or other microcontrollers. The ATmega328 provides UART TTL (5V) serial communication, which is available on digital pins 0 (RX) and 1 (TX). An ATmega16U2 on the board channels this serial communication over USB and appears as a virtual com port to software on the computer. The 16U2 firmware uses the standard USB COM drivers, and no external driver is needed. However, on Windows, an info file is required. Arduino Software (IDE) includes a serial monitor which allows simple textual data to be sent to and from the board. The RX and TX LEDs on the board will flash when data is being transmitted via the USB-to-serial chip and USB connection to the computer (but not for serial communication on pins 0 and 1). A Software Serial library allows serial communication on any of the Uno's digital pins.

❖ Automatic (software) reset

Rather than requiring a physical press of the reset button before an upload, the Arduino/Genuino Uno board is designed in a way that allows it to be reset by software running on a connected computer. One of the hardware flow control lines (DTR) of the ATmega8U2/16U2 is connected to the reset line of the ATmega328 via a 100 Nano farad capacitor. When this line is asserted (taken low), the reset line drops long enough to reset the chip. This setup has other implications. When the Uno is connected to a computer running Mac OS X or Linux, it resets each time a connection is made to it from software (via USB). For the following half-second or so, the boot loader is running on the Uno. While it is programmed to ignore malformed data (i.e. anything besides an upload of new code), it will intercept the first few bytes of data sent to the board after a connection is opened.

5.1.2Parts of the Arduino Uno

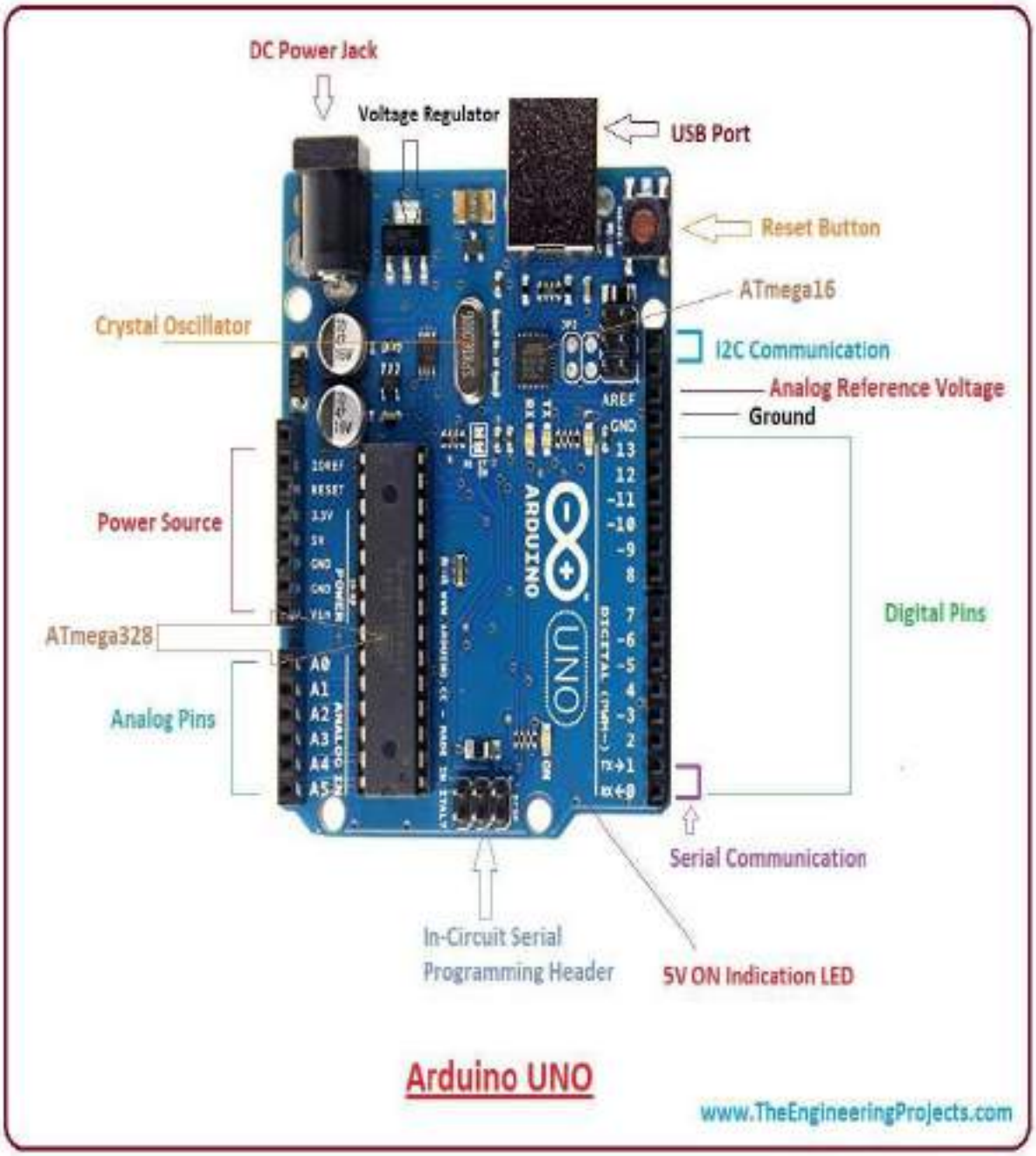
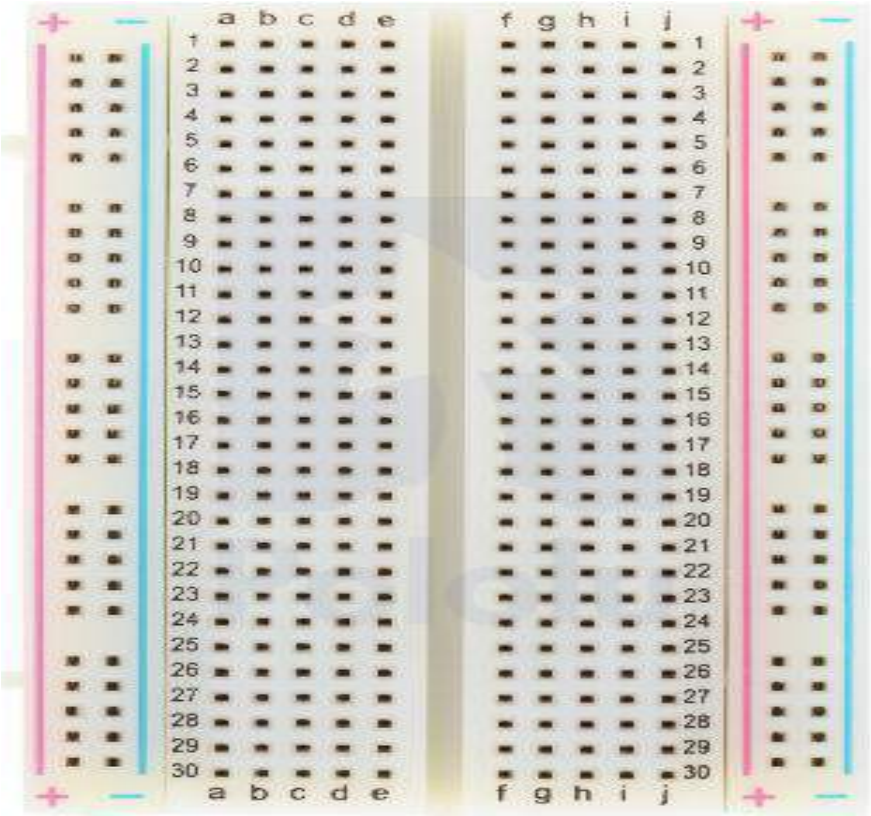


Fig:5.4

5.2 BREADBOARD

A breadboard is a construction base for prototyping of electronics. Originally the word referred to a literal bread board, a polished piece of wood used for slicing bread. In the 1970s the solder less breadboard (a.k.a. plug board, a terminal array board) became available and nowadays the term "breadboard" is commonly used to refer to these. Because the solder less breadboard does not require soldering, it is reusable. This makes it easy to use for creating temporary prototypes and experimenting with circuit design. For this reason, solder less breadboards are also popular with students and in technological education. Older breadboard types did not have this property. A strip board (Vero board) and similar prototyping printed circuit boards, which are used to build semi-permanent soldered prototypes or one-offs, cannot easily be reused. A variety of electronic systems may be prototyped by using breadboards, from small analog and digital circuits to complete central processing units (CPUs).



5.2.1 PARTS OF THE BREAD BOARD

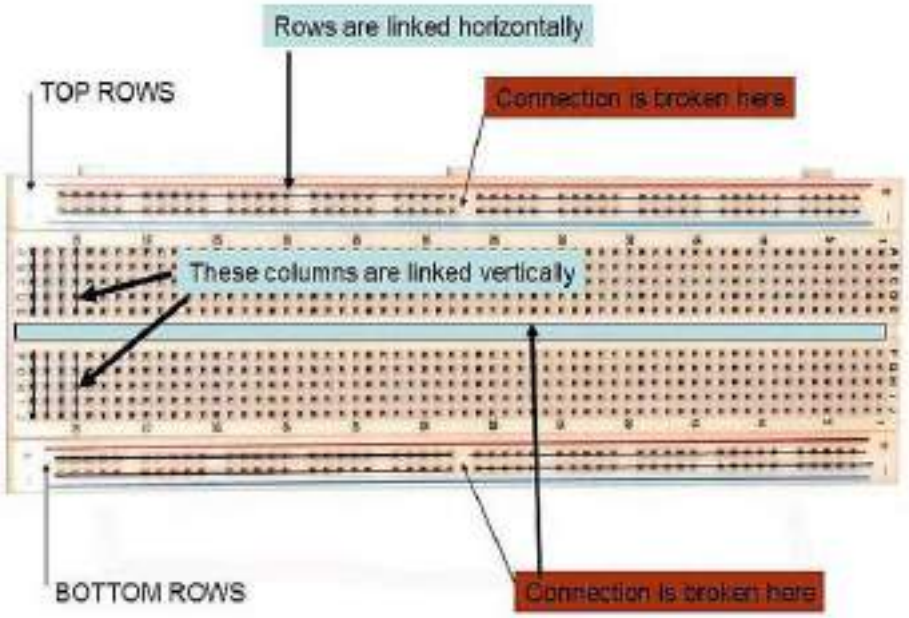


Fig 5.6

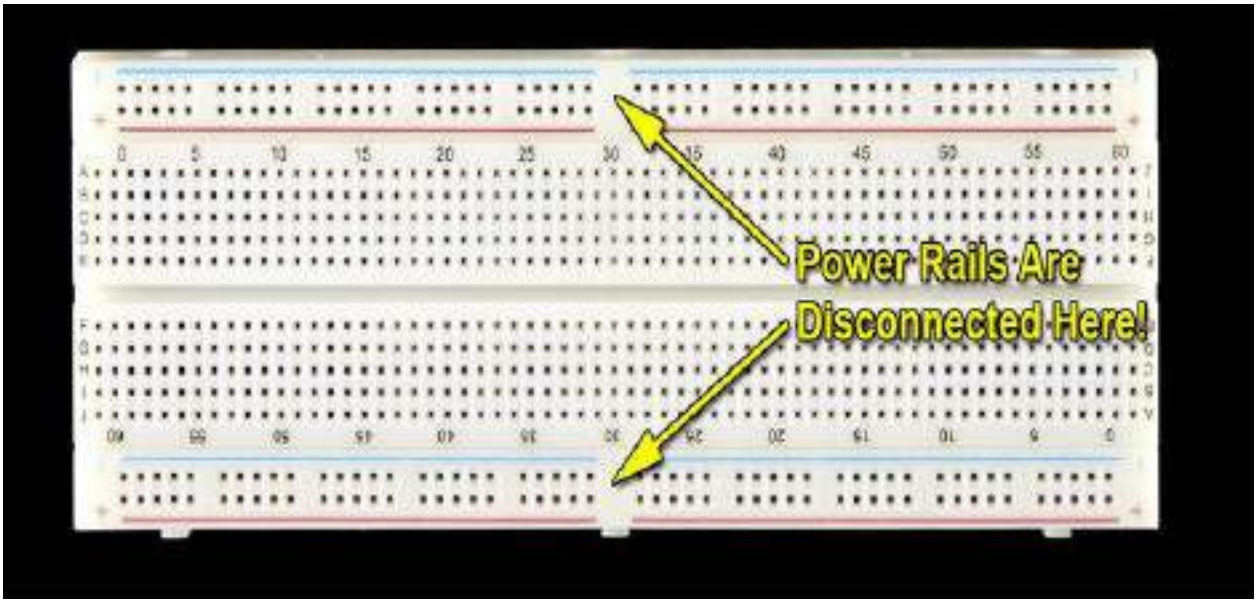


Fig: 5.7

Contents

❖ *Evolution:*

Fig: 5.8

Fig: 5.9

This 1920s TRF radio manufactured by Signal was constructed on a wooden breadboard.

In the early days of radio, amateurs nailed bare copper wires or terminal strips to a wooden board (often literally a board to slice bread on) and soldered electronic components to them. Sometimes a paper schematic diagram was first glued to the board as a guide to placing terminals, then components and wires were installed over their symbols on the schematic. Using thumbtacks or small nails as mounting posts was also common. Breadboards have evolved over time, with the term now being used for all kinds of prototype electronic devices. For example, US Patent 3,145,483 was filed in 1961 and describes a wooden plate breadboard with mounted springs and other facilities. US Patent 3, 496, 419, was filed in 1967 and refers to a particular printed circuit board layout as a Printed Circuit Breadboard. Both examples refer to and describe other types of breadboards as prior art. The breadboard most commonly used today is usually made of white plastic and is a pluggable (solder less) breadboard. It was designed by Ronald J. Portugal in 1971.

❖ Alternatives

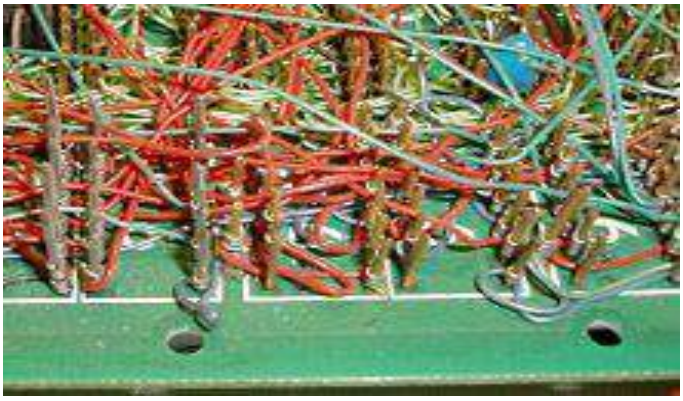


Fig: 5.10 Wire wrap backplane

Alternative methods to create prototypes are point-to-point construction (reminiscent of the original wooden breadboards), wire wrap, wiring pencil, and boards like the strip board. Complicated systems, such as modern computers comprising millions of transistors, diodes, and resistors, do not lend themselves to prototyping using breadboards, as their complex designs can be difficult to lay out and debug on a breadboard. Modern circuit designs are generally developed using a schematic capture and simulation system, and tested in software simulation before the first prototype circuits are built on a printed circuit board. Integrated circuit designs are a more extreme version of the same process: since producing prototype silicon is costly, extensive software simulations are performed before fabricating the first prototypes. However, prototyping techniques are still used for some applications such as RF circuits, or where software models of components

are inexact or incomplete. It is also possible to use a square grid of pairs of holes where one hole per pair connects to its row and the other connects to its column. This same shape can be in a circle with rows and columns each spiraling opposite clockwise/counterclockwise.

❖ Advanced solder less breadboards

Some manufacturers provide high-end versions of solder less breadboards. These are typically high-quality breadboard modules mounted on a flat casing. The casing contains additional equipment for bread boarding, such as a power supply, one or more signal generators, serial interfaces, LED display or LCD modules, and logic probes. Solder less breadboard modules can also be found mounted on devices like microcontroller evaluation boards. They provide an easy way to add additional periphery circuits to the evaluation board.

High frequencies and dead bugs

For high-frequency development, a metal breadboard affords a desirable solder able ground plane, often an unattached piece of printed circuit board; integrated circuits are sometimes stuck upside down to the breadboard and soldered to directly, a technique Sometimes called "dead bug" construction because of its appearance. Examples of dead bug with ground plane construction are illustrated in a Linear Technologies application note.

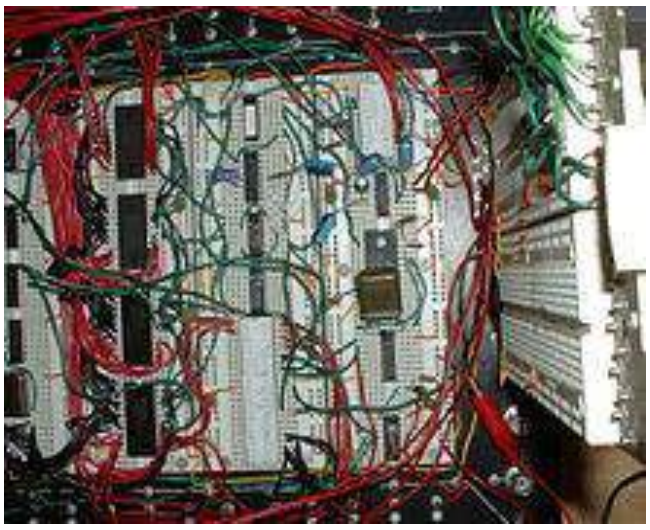


Fig: 5.2Complex circuit built around a microprocessor

Due to relatively large parasitic capacitance compared to a properly laid out PCB (approx. 2pF between adjacent contact columns), high inductance of some connections and a relatively high and not very reproducible contact resistance, solder less breadboards are limited to operation at

relatively low frequencies, usually less than 10 MHz, depending on the nature of the circuit. The relatively high contact resistance can already be a problem for some DC and very low frequency circuits. Solder less breadboards are further limited by their voltage and current ratings. Solder less breadboards usually cannot accommodate surface-mount technology devices (SMD) or components with grid spacing other than 0.1 inches (2.54 mm). Further, they cannot accommodate components with multiple rows of connectors if these connectors do not match the dual in-line layout—it is impossible to provide the correct electrical connectivity. Sometimes small PCB adapters called "breakout adapters" can be used to fit the component to the board. Such adapters carry one or more components and have 0.1 inches (2.54 mm) spaced male connector pins in a single in-line or dual in-line layout, for insertion into a solder less breadboard. Larger components are usually plugged into a socket on the adapter, while smaller components (e.g., SMD resistors) are usually soldered directly onto the adapter. The adapter is then plugged into the breadboard via the 0.1 in (2.54 mm) connectors. However, the need to solder the components onto the adapter negates some of the advantage of using a solder less breadboard. Very complex circuits can become unmanageable on a solder less breadboard due to the large amount of wiring required. The very convenience of easy plugging and unplugging of connections also makes it too easy to accidentally disturb a connection and the system becomes unreliable. It is possible to prototype systems with thousands of connecting points, but great care must be taken in careful assembly, and such a system becomes unreliable as contact resistance develops over time. At some point, very complex systems must be implemented in a more reliable interconnection technology, to have a likelihood of working over a usable time period.

❖ Typical specifications

A modern solder less breadboard socket consists of a perforated block of plastic with numerous tin plated phosphor bronze or nickel silver alloy spring clips under the perforations. The clips are often called tie points or contact points. The number of tie points is often given in the specification of the breadboard. The spacing between the clips (lead pitch) is typically 0.1 inches (2.54 mm). Integrated circuits (ICs) in dual in-line packages (DIPs) can be inserted to straddle the centerline of the block. Interconnecting wires and the leads of discrete components (such as capacitors, resistors, and inductors) can be inserted into the remaining free holes to complete the circuit. Where ICs are not used, discrete components and connecting wires may use any of the holes. Typically the spring clips are rated for 1 ampere at 5 volts and 0.333 amperes at 15 volts (5 watts). The edge of the board has male and female dovetail notches so boards can be clipped

together to form a large breadboard.

- **Bus and terminal strips**

Solder less breadboards connect pin to pin by metal strips inside the breadboard. The layout of a typical solderless breadboard is made up from two types of areas, called strips. Strips consist of interconnected electrical terminals.

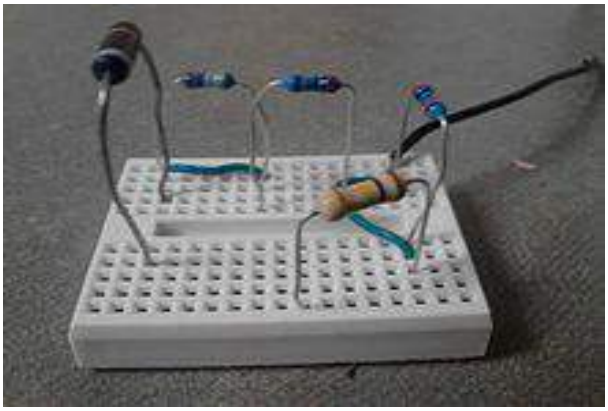


Fig:5.12 Breadboard consisting of only terminal strips but no bus strips

Terminal strips

The main areas, to hold most of the electronic components

In the middle of a terminal strip of a breadboard, one typically finds a notch running in parallel to the long side. The notch is to mark the centerline of the terminal strip and provides limited airflow (cooling) to DIP ICs straddling the centerline. The clips on the right and left of the notch are each connected in a radial way; typically five clips (i.e., beneath five holes) in a row on each side of the notch are electrically connected. The five rows on the left of the notch are often marked as A, B, C, D, and E, while the ones on the right are marked F, G, H, I and J. When a "skinny" dual in-line pin package (DIP) integrated circuit (such as a typical DIP-14 or DIP-16, which have a 0.3-inch (7.6 mm) separation between the pin rows) is plugged into a breadboard, the pins of one side of the chip are supposed to go into row E while the pins of the other side go into row F on the other side of the notch. The columns are identified by numbers from 1 to as many the breadboard design goes. Most of the breadboards are designed to accommodate 17, 30 or 64 columns in the mini, half, and full configurations respectively.

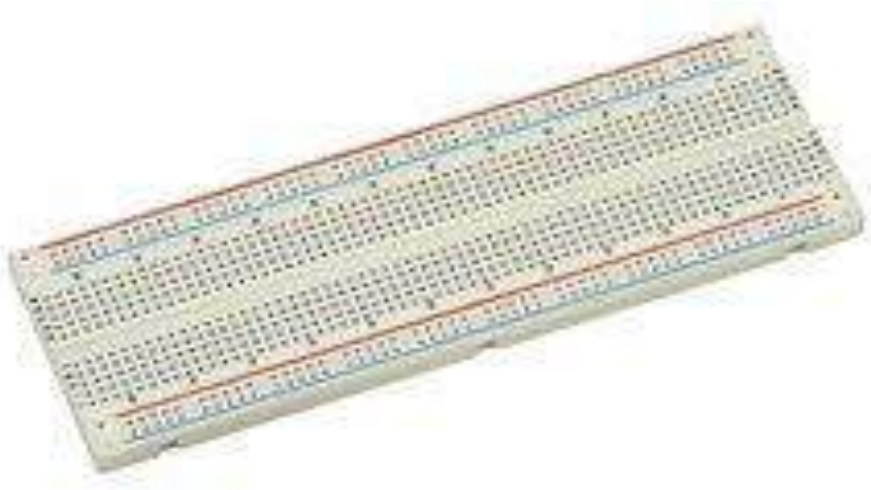


Fig:5.13 Solder less breadboard with dual bus strips on both sides

us strips

A bus strip usually contains two rows: one for ground and one for a supply voltage. However, some breadboards only provide a single-row power distributions bus strip on each long side. Typically the row intended for a supply voltage is marked in red, while the row for ground is marked in blue or black. Some manufacturers connect all terminals in a column. Others just connect groups of, for example, 25 consecutive terminals in a column. The latter design provides a circuit designer with some more control over crosstalk (inductively coupled noise) on the power supply bus. Often the groups in a bus strip are indicated by gaps in the color marking. Bus strips typically run down one or both sides of a terminal strip or between terminal strips. On large breadboards additional bus strips can often be found on the top and bottom of terminal strips.

Note there are two different common alignments for the power bus strips. On small boards, with about 30 rows, the holes for the power bus are often aligned between the signal holes. On larger boards, about 63 rows, the power bus strip holes are often in alignment with the signal holes. This makes some accessories designed for one board type incompatible with the other. For example, some Raspberry Pi GPIO to breadboard adapters use offset aligned power pins, making them not fit breadboards with aligned power bus rows. There are no official standards, so the users need to pay extra attention to the compatibility between a specific model of breadboard and a specific accessory. Vendors of accessories and breadboards are not always clear in their specifications of which alignment they use. Seeing a close up photograph of the pin/hole arrangement can help determine compatibility.

Fig:5.14 Inside of a solderless breadboard strip

Some manufacturers provide separate bus and terminal strips. Others just provide breadboard blocks which contain both in one block. Often breadboard strips or blocks of one brand can be clipped together to make a larger breadboard. In a more robust variant, one or more breadboard strips are mounted on a sheet of metal. Typically, that backing sheet also holds a number of binding posts. These posts provide a clean way to connect an external power supply. This type of breadboard may be slightly easier to handle. Several images in this article show such solderless breadboards.

A "full size" terminal breadboard strip typically consists of around 56 to 65 rows of connectors, each row containing the above-mentioned two sets of connected clips (A to E and F to J). Together with bus strips on each side this makes up a typical 784 to 910 tie point solderless breadboard. "Small size" strips typically come with around 30 rows. Miniature solderless breadboards as small as 17 rows (no bus strips, 170 tie points) can be found, but these are only suitable for small and simple designs.

2.3Jumper wires

Fig: 5.15 Stranded 22AWG jump wires with solid tips

Jump wires (also called jumper wires) for solderless bread boarding can be obtained in ready-to-use jump wire sets or can be manually manufactured. The latter can become tedious work for larger circuits. Ready-to-use jump wires come in different qualities, some even with tiny plugs attached to the wire ends. Jump wire material for ready-made or homemade wires should usually be 22 AWG (0.33 mm^2) solid copper, tin-plated wire - assuming no tiny plugs are to be attached to the wire ends. The wire ends should be stripped $^{3}\!/_{16}$ to $^{5}\!/_{16}$ in (4.8 to 7.9 mm). Shorter stripped wires might result in bad contact with the board's spring clips (insulation being caught in the springs). Longer stripped wires increase the likelihood of short-circuits on the board. Needle-nose pliers and tweezers are helpful when inserting or removing wires, particularly on crowded boards. Differently colored wires and color-coding discipline are often adhered to for consistency. However, the number of available colors is typically far fewer than the number of signal types or paths. Typically, a few wire colors are reserved for the supply voltages and ground (e.g., red, blue, black), some are reserved for main signals, and the rest are simply used where convenient. Some ready-to-use jump wire sets use the color to indicate the length of the wires, but these sets do not allow a meaningful color-coding schema.

Types of Jumper wires

Fig:5.16 Male to Male

Fig: 5.17 MALE TO MALE

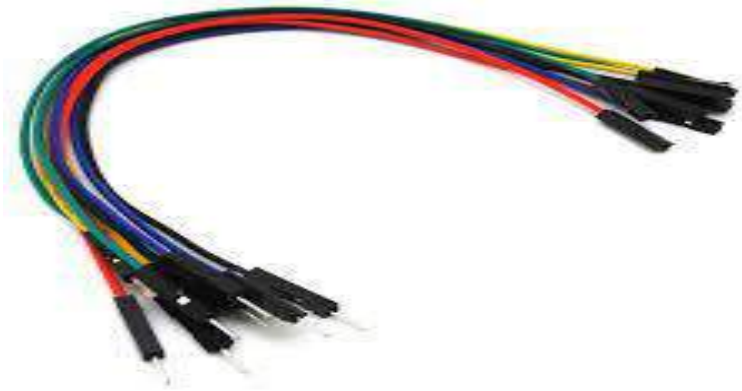


Fig: 5.18 MALE TO FEMALE

Design

Jumper pins (points to be connected by the jumper) are arranged in groups called jumper blocks, each group having at least one pair of contact points. An appropriately sized conductive sleeve called a jumper, or more technically, a shunt jumper, is slipped over the pins to complete the circuit. Jumpers must be electrically conducting; they are usually encased in a non-conductive block of plastic for convenience. This also avoids the risk that an unshielded jumper will accidentally short out something critical (particularly if it is dropped on a live circuit).

Use of Jumper Wires

When a jumper is placed over two or more jumper pins, an electrical connection is made between them, and the equipment is thus instructed to activate certain settings accordingly. For example, with older PC systems, CPU speed and voltage settings were often made by setting jumpers. Some documentation may refer to setting the jumpers to on, off, closed, or open. When a jumper is on or covering at least two pins it is a closed jumper, when a jumper is off, is covering

only one pin, or the pins have no jumper it is an open jumper. Jumper less designs have the advantage that they are usually fast and easy to set up, often require little technical knowledge, and can be adjusted without having physical access to the circuit board. With PCs, the most common use of jumpers is in setting the operating mode for ATA drives (master, slave, or cable select), though this use is declining with the rise of SATA drives. Jumpers have been used since the beginning of printed circuit boards.

5.3 INFRARED RADIATIONS SENSOR (IR)

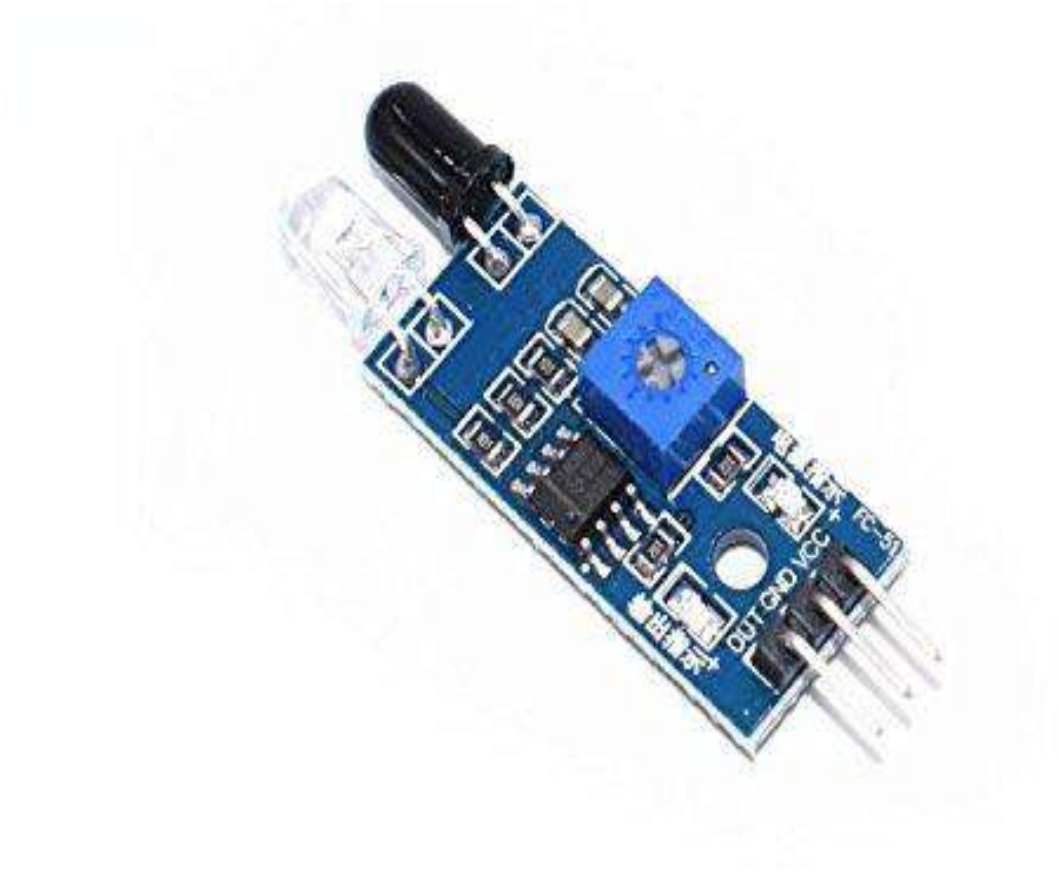


Fig: 5.19

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 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 0^0K".

Stephen – Boltzmann law states that “at all wavelengths, 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. 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 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 is used to focus the infrared radiation. Infrared receivers can be photodiodes, phototransistors etc. some important specifications of infrared receivers are photosensitivity, detectivity and noise equivalent power. Signal processing is done by amplifiers as the output of infrared detector is very small.

Parts of Infrared radiation sensor

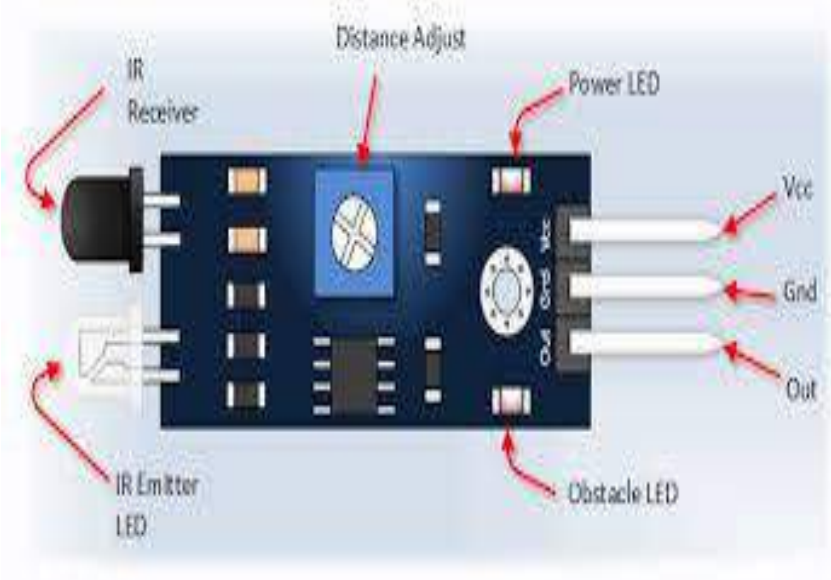


Fig:5.20

5.3.1 Types of IR Sensors

Infrared sensors can be passive or active. Passive infrared sensors are basically Infrared detectors. Passive infrared sensors do not use any infrared source and detects energy emitted by obstacles in the field of view. They are of two types: quantum and thermal. Thermal infrared sensors use infrared energy as the source of heat and are independent of wavelength. Thermocouples, pyro electric detectors and bolometers are the common types of thermal infrared detectors. Quantum type infrared detectors offer higher detection performance and are faster than thermal type infrared detectors. The photosensitivity of quantum type detectors is wavelength dependent. Quantum type detectors are further classified into two types: intrinsic and extrinsic types. Intrinsic type quantum detectors are photoconductive cells and photovoltaic cells.

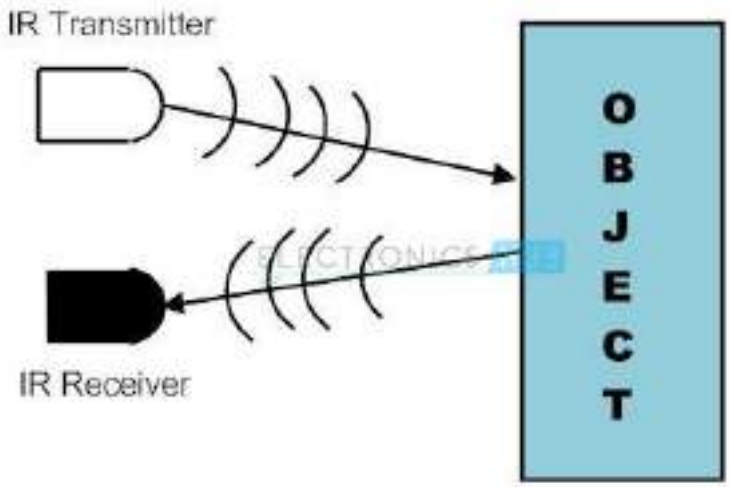


Fig: 5.21

Active infrared sensors consist of two elements: infrared source and infrared detector. Infrared sources include an LED or infrared laser diode. Infrared detectors include photodiodes or phototransistors. The energy emitted by the infrared source is reflected by an object and falls on the infrared detector.

IR Transmitter

Infrared Transmitter is a light emitting diode (LED) which emits infrared radiations. Hence, they are called IR LED's. Even though an IR LED looks like a normal LED, the radiation emitted by it is invisible to the human eye.

The picture of a typical Infrared LED is shown below.

Fig:5.22

There are different types of infrared transmitters depending on their wavelengths, output power and response time. A simple infrared transmitter can be constructed using an infrared LED, a current limiting resistor and a power supply. The schematic of a typical IR transmitter is shown below.

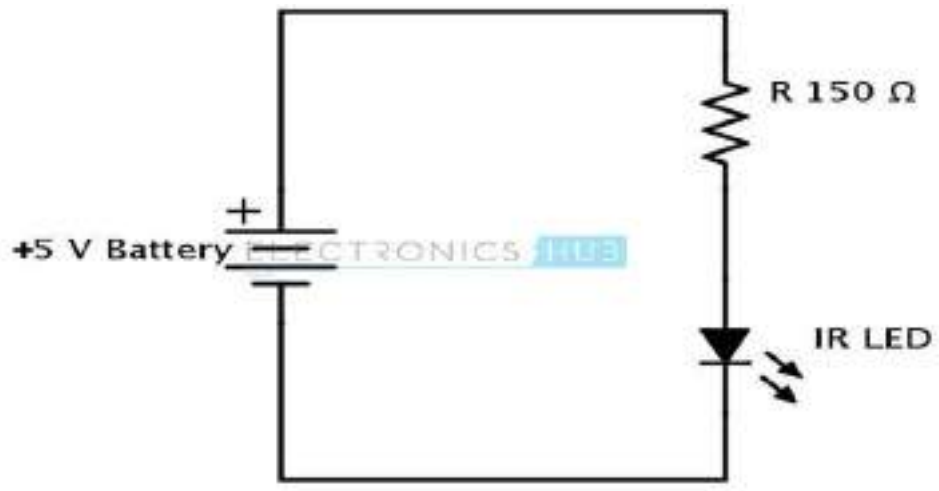


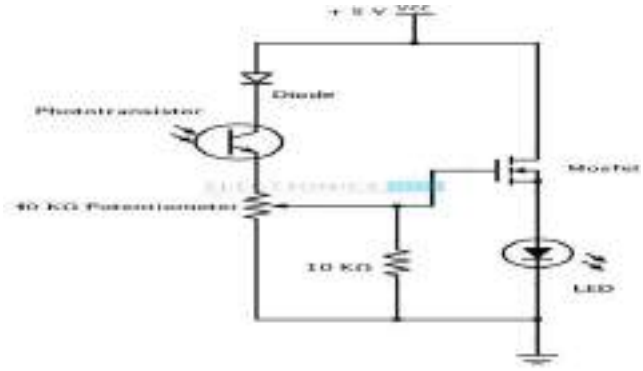
Fig: 5.23

When operated at a supply of 5V, the IR transmitter consumes about 3 to 5 mA of current. Infrared transmitters can be modulated to produce a particular frequency of infrared light. The most commonly used modulation is OOK (ON – OFF – KEYING) modulation.IR transmitters can be found in several applications. Some applications require infrared heat and the best infrared source is infrared transmitter. When infrared emitters are used with Quartz, solar cells can be made.

IR Receiver

Infrared receivers are also called as infrared sensors as they detect the radiation from an IR transmitter. IR receivers come in the form of photodiodes and phototransistors. Infrared Photodiodes are different from normal photo diodes as they detect only infrared radiation. The picture of a typical IR receiver or a photodiode is shown below.

Fig: 5.24 IR Receiver



Different types of IR receivers exist based on the wavelength, voltage, package, etc. When used in an infrared transmitter – receiver combination, the wavelength of the receiver should match with that of the transmitter. A typical infrared receiver circuit using a phototransistor is shown below.

Fig: 5.25

It consists of an IR phototransistor, a diode, a MOSFET, a potentiometer and an LED. When the phototransistor receives any infrared radiation, current flows through it and MOSFET turns on. This in turn lights up the LED which acts as a load. The potentiometer is used to control the sensitivity of the phototransistor.

5.3.2 Principle of Working

The principle of an IR sensor working as an Object Detection Sensor can be explained using the following figure. An IR sensor consists of an IR LED and an IR Photodiode; together they are called as Photo – Coupler or Opto – Coupler.

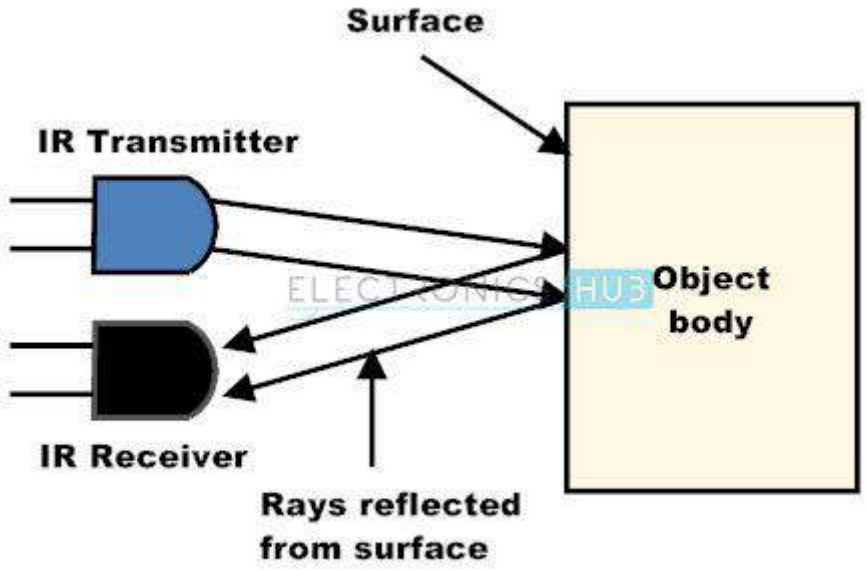


Fig:5.26

When the IR transmitter emits radiation, it reaches the object and some of the radiation reflects back to the IR receiver. Based on the intensity of the reception by the IR receiver, the output of the sensor is defined.

Obstacle Sensing Circuit or IR Sensor Circuit: A typical IR sensing circuit is shown below.

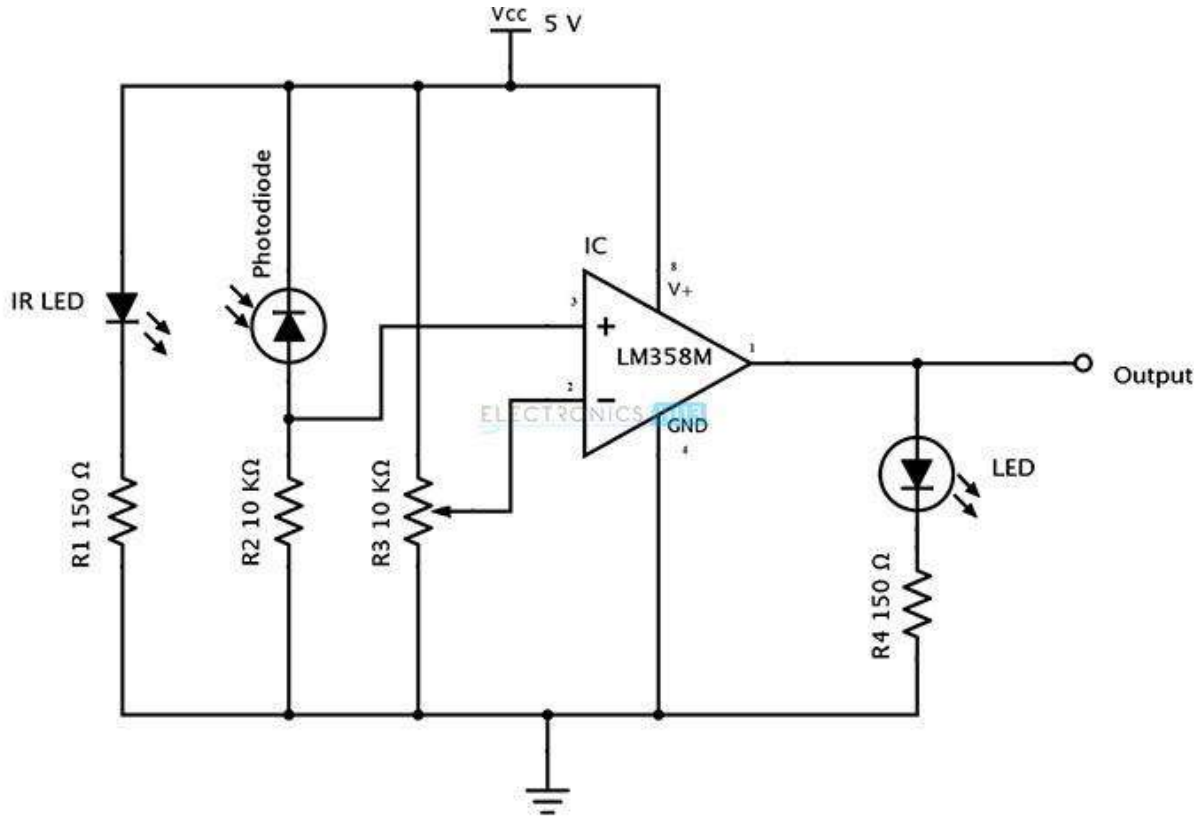
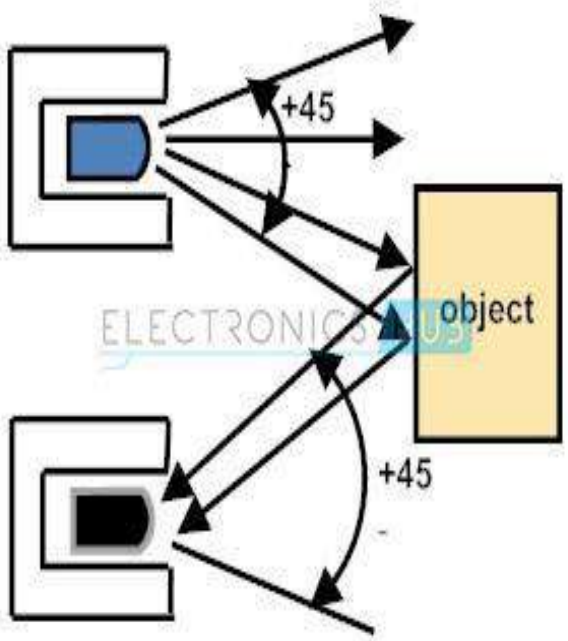


Fig :5.27

It consists of an IR LED, a photodiode, a potentiometer, an IC Operational amplifier and an LED.IR LED emits infrared light. The Photodiode detects the infrared light. An IC Op – Amp is used as a voltage comparator. The potentiometer is used to calibrate the output of the sensor according to the requirement. When the light emitted by the IR LED is incident on the photodiode after hitting an object, the resistance of the photodiode falls down from a huge value. One of the input of the op – amp is at threshold value set by the potentiometer. The other input to the op-amp is from the photodiode's series resistor. When the incident radiation is more on the photodiode, the voltage drop across the series resistor will be high. In the IC, both the threshold voltage and the voltage across the series resistor are compared. If the voltage across the resistor series to photodiode is greater than that of the threshold voltage, the output of the IC Op – Amp is high. As the output of the IC is connected to an LED, it lightens up. The threshold voltage can be adjusted by adjusting the potentiometer depending on the environmental conditions.

The positioning of the IR LED and the IR Receiver is an important factor. When the IR LED is held directly in front of the IR receiver, this setup is called Direct Incidence. In this case, almost the entire radiation from the IR LED will fall on the IR receiver. Infrared transmitter and the receiver. If an object falls in this line, it obstructs the radiation from reaching the receiver either by reflecting the radiation or absorbing the radiation.

DIRECTIVITY OF THE SENSOR



5.4 Light Emitting Diode (LED)

A light-emitting diode (LED) is a semiconductor light source that emits light when current flows through it. Electrons in the semiconductor recombine with electron holes, releasing energy in the form of photons. The color of the light (corresponding to the energy of the photons) is determined by the energy required for electrons to cross the band gap of the semiconductor. White light is obtained by using multiple semiconductors or a layer of light-emitting phosphor on the semiconductor device.

Fig:5.29

Appearing as practical electronic components in 1962, the earliest LEDs emitted low-intensity infrared light. Infrared LEDs are used in remote-control circuits, such as those used with a wide variety of consumer electronics. The first visible-light LEDs were of low intensity and limited to red. Modern LEDs are available across the visible, ultraviolet, and infrared wavelengths, with high light output. Early LEDs were often used as indicator lamps, replacing small incandescent bulbs, and in seven-segment displays. Recent developments have produced high-output white light LEDs suitable for room and outdoor area lighting. LEDs have led to new displays and sensors, while their high switching rates are useful in advanced communications technology.

Fig:5.30

LEDs have many advantages over incandescent light sources, including lower energy consumption, longer lifetime, improved physical robustness, smaller size, and faster switching. LEDs are used in applications as diverse as aviation lighting, automotive headlamps, advertising, general lighting, traffic signals, camera flashes, lighted wallpaper, horticultural grow lights, and medical devices. Unlike a laser, the light emitted from an LED is neither spectrally coherent nor even highly monochromatic. However, its spectrum is sufficiently narrow that it appears to the human eye as a pure (saturated) color. Nor, unlike most lasers, is its radiation spatially coherent, so that it cannot approach the very high brightness's characteristic of lasers.

5.4.1 Types of Light Emitting Diode (LED)

Fig:5.31 Parts of Light Emitting Diode (LED)

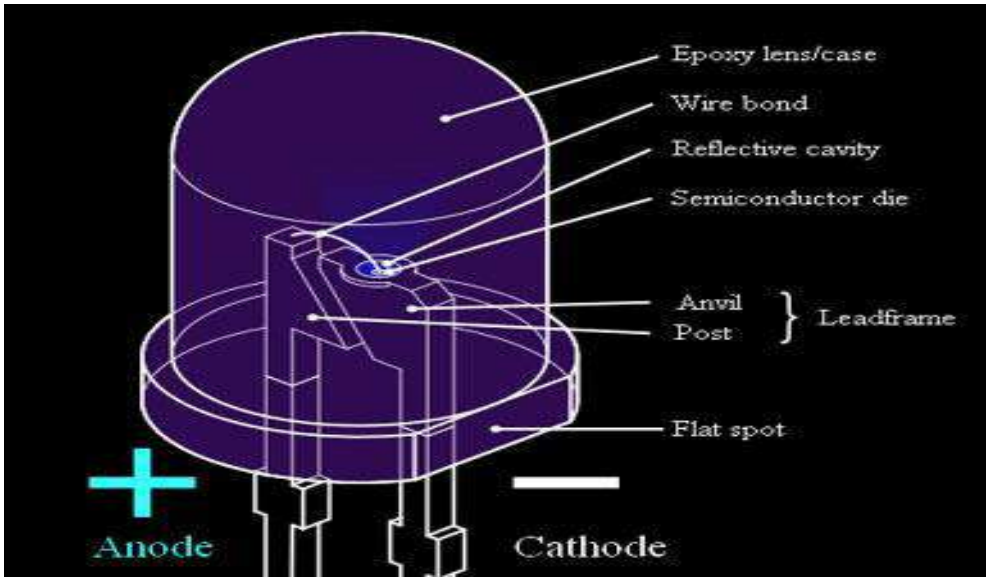


Fig:5.32

5.5 Light Dependent Resistor (LDR)

A photo resistor or light dependent resistor is a component that is sensitive to light. When light falls upon it then the resistance changes. Values of the resistance of the LDR may change over many orders of magnitude the value of the resistance falling as the level of light increases. It is not uncommon for the values of resistance of an LDR or photo resistor to be several me ohms in darkness and then to fall to a few hundred ohms in bright light. With such a wide variation in resistance, LDRs are easy to use and there are many LDR circuits available. The sensitivity of light dependent resistors or photo resistors also varies with the wavelength of the incident light.LDRs is made from semiconductor materials to enable them to have their light sensitive properties. Many materials can be used, but one popular material for these photo resistors is cadmium sulphide, CdS, although the use of these cells is now restricted in Europe because of environmental issues with the use of cadmium. Similarly cadmium CdSe is also restricted. Other materials that can be used include lead sulphide, PBS and indium antimonite.

5.5.1LDR Structure and Working

The basic structure of an LDR is shown below.

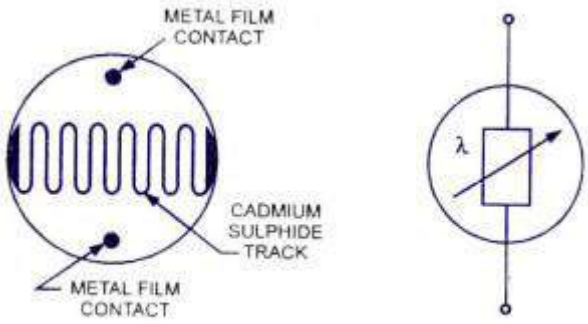


Fig:5.33

The snake like track shown below is the Cadmium Sulphide (CdS) film which also passes through the sides. On the top and bottom are metal films which are connected to the terminal leads. It is designed in such a way as to provide maximum possible contact area with the two metal films. The structure is housed in a clear plastic or resin case, to provide free access to external light. As explained above, the main component for the construction of LDR is cadmium sulphide (CdS),

which is used as the photoconductor and contains no or very few electrons when not illuminated. In the absence of light it is designed to have a high resistance in the range of mega ohms. As soon as light falls on the sensor, the electrons are liberated and the conductivity of the material increases. When the light intensity exceeds a certain frequency, the photons absorbed by the semiconductor give band electrons the energy required to jump into the conduction band. This causes the free electrons or holes to conduct electricity and thus dropping the resistance dramatically (< 1 Kilo ohm).The equation to show the relation between resistance and illumination can be written as

R = Area

Where E – Illumination (lux)
R – Resistance (Ohms)
A, a – constants

The value of 'a' depends on the CdS used and on the manufacturing process. Values usually range between 0.7 and 0.9.

Advantages

LDR's are cheap and are readily available in many sizes and shapes. Practical LDRs are available in a variety of sizes and package styles, the most popular size having a face diameter of roughly 10 mm. They need very small power and voltage for its operation. Light dependent resistors or photo-resistors are often used with LED circuits as simple photo-detectors.

Fig:5.34 19M51 LDR top view.

Note that the brown zigzag stripe forms a "border crossing" between the two terminals. The number of charge carriers that make it across the border is proportional to the amount of light hitting the border zone.In dark conditions the resistance between the terminals is high – up to 1 MΩ or so. The resistance falls with increasing light levels down to a few hundred ohms at high

brightness.

Fig:5.35

The circuit of LDR is an electronic circuit built with LDR, relay, Darlington pair, diode, & resistors shown in the below circuit diagram. The required DC voltage of the LDR circuit is supplied from a bridge rectifier circuit or a battery. This circuit changes the AC supply into a DC. The bridge rectifier circuit uses a step-down transformer to step-down the voltage from 230v into 12v. The diodes are connected in the form of a bridge used to alter the AC voltage into DC. The voltage regulator is used to change the 12v DC-6v DC, and then, this DC voltage is supplied to the entire circuit. A 230v AC supply for both the bridge rectifier and the load is to be kept continuously for continuous operation of the light sensor circuit.

5.5.2 LDR – Light Dependent Resistors Circuit and Working Principle

The controlling of lights and home appliances is generally operated and maintained manually on several occasions. But the process of appliances controlling may cause wastage of power due to the carelessness of human beings or unusual circumstances. To overcome this problem we can use the light-dependent resistor circuit for controlling the loads based on the intensity of light. An LDR or a photo resistor is a device that is made up of high resistance semiconductor material. This article gives an overview of what is LDR, light-dependent resistor.

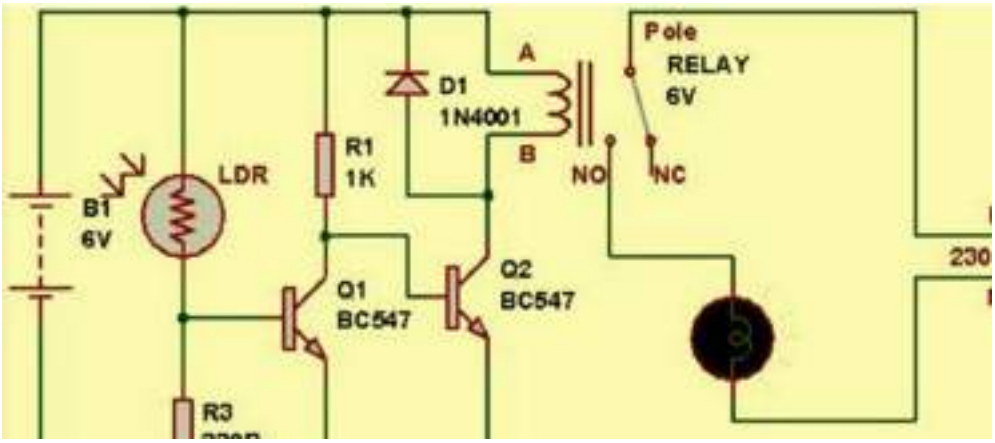


Fig: 5.36 Light Dependent Resistors

5.5.3Construction of an LDR

The construction of an LDR includes a light-sensitive material that is placed on an insulating substrate like as ceramic. The material is placed in a zigzag shape in order to get the required power rating and resistance. The area of zigzag separates the metal placed areas into two regions.

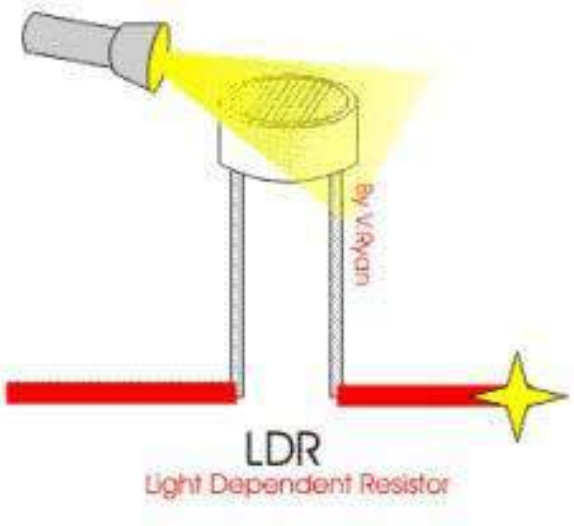


Fig:5.37

5.5.4 Working Principle of LDR

This resistor works on the principle of photo conductivity. It is nothing but, when the light falls on its surface, then the material conductivity reduces and also the electrons in the valence band of the device are excited to the conduction band. These photons in the incident light must have energy greater than the band gap of the semiconductor material. This makes the electrons to jump from the valence band to conduction.

These devices depend on the light, when light falls on the LDR then the resistance decreases, and increases in the dark. When a LDR is kept in the dark place, its resistance is high and, when the LDR is kept in the light its resistance will decrease.

5.5.5 Types of light Dependent Resistors

Light dependent resistors are classified based on the materials used.

Intrinsic Photo Resistors

These resistors are pure semiconductor devices like silicon or germanium. When the light falls on the LDR, then the electrons get excited from the valence band to the conduction band and number of charge carriers increases.

Extrinsic Photo Resistors

These devices are doped with impurities and these impurities create a new energy bands above the valence band. These bands are filled with electrons. Hence this decrease the band gap and small amount of energy is required in moving them. These resistors are mainly used for long wavelengths.

5.5.6 Circuit Diagram of a Light Dependent Resistor

The circuit diagram of a LDR is shown below. When the light intensity is low, then the resistance of the LDR is high. This stops the current flow to the base terminal of the transistor. So, the LED does not light. However, when the light intensity onto the LDR is high, then the resistance of the LDR is low. So current flows onto the base of the first transistor and then the second transistor. Consequently the LED lights. Here, a preset resistor is used to turn up or down to increase or decrease the resistance.

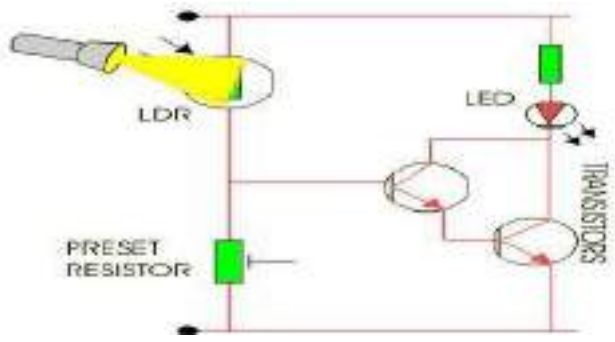


Fig: 5.38 Light Dependent Resistor Circuit

5.5.7 LDR Based light Intensity Control for Street Lights

In the proposed system, generally the lighting up of highways is done through HID lamps. Because, the energy consumption of these lamps is high. This project uses an LEDs to overcome the drawbacks of HID lamps. This project demonstrates the usage of light emitting diodes as a light source. These lights consumes low power and its life is more as compared to HID lamps. A light depending resistor is used to detect the light. The resistance of the LDR drastically reduces according to the daylight. A bunch of LEDs are used to make a street light. The microcontroller comprises programmable instructions that controls the light intensity based on the Pulse width modulation signals generated. The light intensity is kept high during the peak hours, and as the traffic on the highways tend to decrease in late nights: and the light intensity also decreases till morning. Finally, the street lights completely shut down at object is not near by the sensor.

In future, this project can be developed by connecting it with a solar panel, which converts the intensity of the solar into corresponding voltage, and this energy is used to feed the street lights on highways.

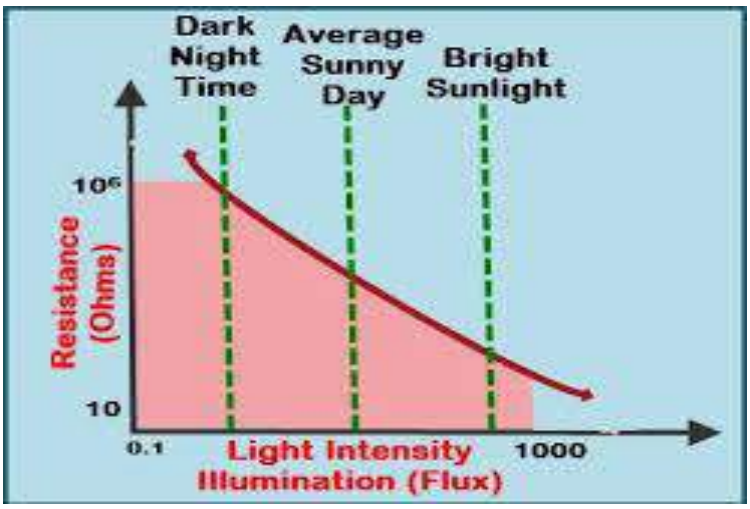


Fig:5.39

Code

```
int led = 2;
int led1 = 3;
int ldr = A5;
int ir = A0;
int ir1 = A1;
Void setup ()
{
 Serial. Begin (9600);
 pinMode (led, OUTPUT);
 pinMode (led1, OUTPUT);
 pinMode (ldr, INPUT);
 pinMode (ir, INPUT);
 pinMode (ir1, INPUT);
}
Void loop ()
{
Serial.println (analogRead (A5));
int ldrStatus = analogRead (ldr);
if (ldrStatus <=500)
{
digitalWrite(led, HIGH);
analogWrite(led,255/5);
digitalWrite (led1, HIGH);
 analogWrite(led1,255/5);
  if (analogRead(A0)<300)       // IR 1 CODE
{
  digitalWrite(led,HIGH);
   analogWrite(led,255);
   delay(1000);// micro second
}
else
{
digitalWrite(led,HIGH);
```

```
 analogWrite(led,255/5);
}
if (analogRead(A1) <300)       // IR 1 CODE
{
 digitalWrite(led1,HIGH);
 analogWrite(led1,255);
 delay (1000); // micro second
 }
 else
{
 digitalWrite(led1,HIGH);
  analogWrite(led1,255/5);
}
}
else
{
  digitalWrite(led1, LOW);
  digitalWrite(led2, LOW);
}
```

- **Automatic Street lights working**

Street lights work automatically with the use of a photo electric cell when it gets dull light will turn on the photocell has a light sensitive resistor as it gets dark it shorts out and causes a heater to operate inside and bimetal strip contact bend with heat and makes the circuit!

- **Automatic Street Light by Using LDR**

It automatically switches ON lights when the sunlight goes below the visible region of our eyes. (E.g. in evening after Sunset). It automatically switches OFF lights when Sunlight fall on it (i.e. on **l** LDR) e.g. in morning, by using a sensor called LDR (Light Dependent Resistor) which senses the ight just like our eyes.

- **Benefit of Automatic Street Light**

Automatic street light system has the various advantages. These make the work easier so you don't have required the labor force because as the name indicates it is automatic. These are reliable lights for streets and effective one. Whenever you want these can be converted from auto to manual mode easily.

➢ Principle of Automatic Street Light

The working principle of LDR is that it gives less resistance in high light intensity and high resistance in low light intensity (i.e.) it gives high resistance in dark or night and low resistance in day or light. Here we use transistor as a two way switch.

➢ Current measured

Current can be measured using an ammeter. Electric current can be directly measured with a galvanometer, but this method involves breaking the electrical circuit, which is sometimes inconvenient. Current can also be measured without breaking the circuit by detecting the magnetic field associated with the current.

➢ *The Purpose of Automatic Street Light*

The main purpose of this project "automatic street light control with different light intensity" is to minimize the cost & loss of electricity and also man power to manually on- off the street light. Our objective is to provide a fully automated street light control which will definitely affect mankind.

Fig: 5.40

6. Conclusion

The Streetlight controller using ldr based Light intensity &traffic density, in the todays up growing countries will be more effective in case of cost, manpower and security as compare with today's running complicated and complex light controlling systems. Automatic Street Light Controlling System puts up a very user friendly approach and could increase the power

This paper elaborates the design and construction of automatic street control system circuit. Circuit works properly to turn street lamp ON/OFF. After designing the circuit which controls the light of the street as illustrated in the previous sections. LDR sensor and the photoelectric sensors are the two main conditions in working the circuit. If the two conditions have been satisfied the circuit will do the desired work according to specific program.

Each sensor controls the turning ON or OFF the lighting column. The street lights have been successfully controlled by microcontroller. With commands from the controller the lights will be ON in the places of the movement when it's dark. Furthermore the drawback of the street light system using timer controller has been overcome, where the system depends on photoelectric sensor.

7. FUTURE SCOPE

We can save the energy for the future use and we can control the losses of the power. We can implement this project for the home lamp or night lamp of the room. This is also used for the signals.

8. Reference

Project: https://drive.google.com/file/d/0B7JJ...

Cod ing: http://dapalan.com/B4tT

Circuit diagram : http://www.mediafire.com/file/kiyvq3m...

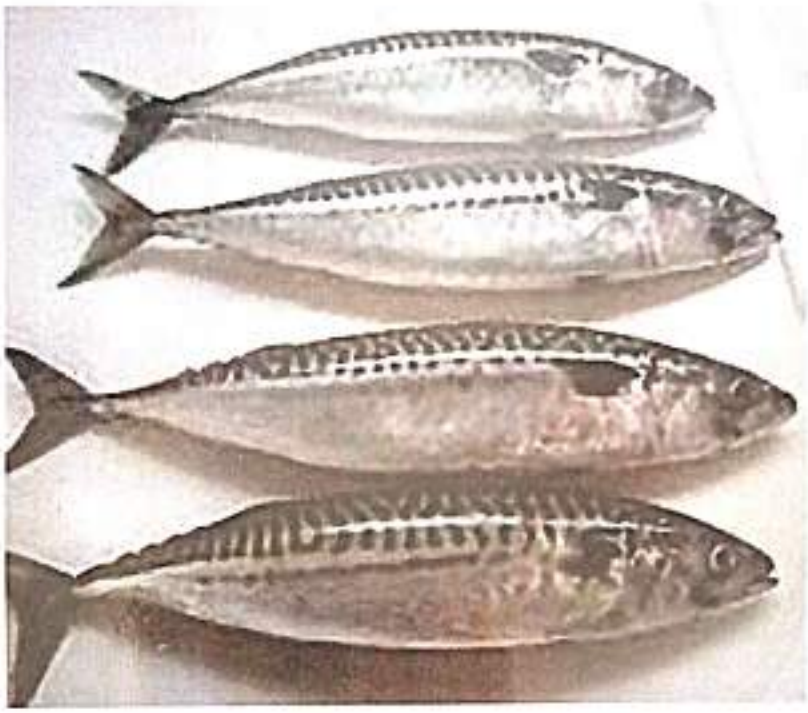
Project report: http://www.mediafire.com/file/vdjbhd6...

:https://www.youtube.com/watch?v=JRzxY...

SIGNIFICANCE OF FISHERIES AND AQUACULTURE

PROJECT DONE BY

P.SOWJANYA



III – B.SC., (2019-20)

DEPARTEMENT OF ZOOLOGY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

A.S.D.GOVT DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

DEPARTMENT OF ZOOLOGY

Reg No :- 1733038

CERTIFICATE

2019-20

Certified that the proposed work entitled **"Significance of fisheries and aquaculture"** is a bonafied work carried out by **P.SOWJANYA** for the sixth semester project work under the supervision of **U.SATYANARAYANA**

Value of

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Significance of fisheries and aquaculture

Introduction

"Fish provides more than one billion poor people with most of their daily animal protein"

Today, fish provides more than one billion poor people with most of their daily animal protein. Fish provides nutrients and micronutrients that are essential to cognitive and physical development, especially in children, and are an important part of a healthy diet. As an affordable animal source of protein in some of the poorest countries, fish is the primary source of nutrition, creating growing demand for this staple. However, fish supplies are failing to meet demand and there are major shortages in some critically poor countries where they are needed most.

Globally, more than 250 million people depend directly on fisheries and aquaculture for their livelihoods and millions are employed in fisheries and aquaculture value chains in roles such as processing or marketing. The very poor often rely on fishing as a primary source of income. These small-scale fishers are particularly vulnerable as fish stocks diminish. Increased productivity from sustainable fisheries and aquaculture can be driver for rural development by mitigating risks to livelihoods and contributing to income generation and employment.

Improving the productivity of fisheries and aquaculture is vital to reducing hunger and poverty for millions in the developing world. Sustainable, productive fisheries and aquaculture improve food and nutrition security, increase income and improve livelihoods, promote economic growth and protect our environment and natural resources.

A sustainable approach to fisheries and aquaculture will help to protect our natural resources and ensure that fish stocks are available for future generations. Currently, overfishing, ineffective management practice, industrial development and agricultural pollution have reduced fish stocks. While sustainable fisheries management is a challenge, solid global and regional governance of these vital resources will ensure that we can produce enough fish for those living in poor regions.

Aquaculture, in particular, has tremendous potential to enhance food security and be environmentally sustainable. Small-scale aquaculture is especially important for meeting the world's growing demand for fish. As fish require a smaller environmental footprint than other animal source food, aquaculture is a more environmentally sustainable option for meeting the world's food needs than other animal source foods.

Because seventy percent of the world's surface is covered in water, humans have realized its importance as a resource. For this reason, one of the areas heavily exploited regarding the use of water as a resource is aquaculture, especially in the production of food as opposed to using the terrestrial land. Aquaculture or fish farming accounts for over 50% of the world market for fish

products. As global populations continue to increase wild populations of commercially captured fish can no longer support this demand. Aquaculture provides an efficient means of protein production.

Aquaculture is the process of rearing, breading and harvesting of aquatic species, both animals and plants in controlled aquatic environments like the oceans, lakes, rivers, ponds and streams. It serves different purpose including food production, restoration of threatened and endangered species populations, wild stock population enhancement, building of aquariums, and fish culture and habitat restoration. Here are the various types of aquacultures as well as their importance.

Types of Aquaculture:

1. Mariculture :

Mariculture is aquaculture that involves the use of sea water. It can either be done next to an ocean, with a sectioned off part of the ocean are in ponds separate from the ocean, but containing sea water all the same. The organisms bred here range from molluscs to sea food options like prawn and other shellfish, and even seaweed.

Growing plants like seaweed are also part of maricultures. These sea plant and animal species, find many uses in manufacturing industries such as in cosmetic and jewellery where collagen from seaweed is used to make facial creams. Pearls are picked from mollusc and made into fashion items.

2. Fish Farming:

Fish Farming is the most common type of aquaculture. It involves the selective breeding of fish, either in fresh water or sea water, with the purpose of producing a food source for consumption. Fish farming is highly exploited as it allows for the production of cheap source of protein.

Furthermore, fish farming is easier to do then other kinds of farming as fish are not care intensive, only requiring food and proper water conditions as well temperatures. The process is also less land intensive as the size of ponds required to grow some fish species such as tilapia is much smaller than the space required to grow the same amount of protein from beef cattle.

3. Algaculture

Alga culture is a type of aquaculture involving the cultivation of algae. Algae are microbial organisms that share animal and plant characteristics in that they are motile sometimes like other microbes but they also contain chloroplasts that make them green and allow them to photosynthesise just like green plants. However, for economic feasiblity, they have to be grown and harvested in large

numbers. Algae are finding many applications in today's markets. Exxon mobile has been making strides in developing them as a new source of energy.

4. Integrated multitrophic aquaculture

IMTA is an advanced system of aquaculture where different trophic levels are mixed into the system to provide different nutritional needs for each other. Notably, it is an efficient system because it tries to emulate the ecological system that exists in the natural habitat.

The IMTA makes use of these intertrophic transfers of resources to ensure maximum resource utilization by using the waste of larger organisms as food sources for the smaller ones. The practice ensures the nutrients are recycled, meaning the process is less wasteful and produces more products.

Benefits of Aquaculture

Economic Benefits

1. Alternative food source

Fish and other seafood are good source of protein. They also have more nutritional value like the addition of natural oils into the diet such as omega 3 fatty acids. Also since it offers white meat, it is better for the blood in reducing cholesterol levels as opposed to beef's red meat. Fish is also easier to keep compared to other meat producing animals as they are able to convert more feed into protein. Therefore, its overall conversion of pound of protein makes it cheaper to rear fish as they use the food more efficiently.

2. Alternative fuel Source

Algae are slowly being developed into alternative fuel sources by having them produces fuels that can replace the contemporary fossil fuels. Algae produces lipids that if harvested can be burn as an alternative fuel source whose only by products would be water when burnt.

Such a breakthrough could ease the dependency of the world on drilled fossils fuels as well as reduce the price of energy by having it grown instead of drilling petroleum. Moreover, algae fuel is cleaner and farmable source of energy, which means it can revolutionize the energy sector and create a more stable economy that avoids the boom-bust nature of oil and replaces it with a more abundant fuel source.

3. Increase Jobs in the market

Aquacultures increases the number of possible jobs in the market as it provides both new products for a market and create job opportunities because of the labor required to maintain the pools and harvest the organisms grown. The Increase in jobs is mostly realized in third world countries as aquaculture provides both a food source and an extra source of income to supplement those who live in these regions.

Aquaculture also saves fishermen time as they do not have to spend their days at sea fishing. It allows them fee time to purpose other economic activities like engaging in alternative businesses. This increase in entrepreneurship provides more hiring possibilities and more jobs.

4. Reduce Sea Food Trade Deficit

The sea food trade in America is mainly based on trade from Asia and Europe, with most of it being imported. The resultant balance places a trade deficit on the nation. Aquaculture would provide a means for the reduction of this deficit at a lower opportunity cost as local production would mean that the sea food would be fresher. It would also be cheaper due to reduce transport costs.

Environmental Benefits

1. Create Barrier against pollution with mollusc and sea weed

Molluscs are filter feeders while seaweed acts a lot like the grass of the sea. Both these organisms sift the water that flows through them as brought in by the current and clean the water. This provides a buffer region that protects the rest of the sea from pollution from the land, specifically from activities that disturb the sea bed and raise dust.

Also, the economic benefits of molluscs and sea weed can create more pressure from government to protect their habitats as they serve an economic importance. The financial benefit realized provides incentive for the government to protect the seas in order to protect sea food revenue.

2. Reduces fishing pressure on wild stock

The practice of aquaculture allow for alternative source of food instead of fishing the same species in their natural habitats. Population numbers of some wild stocks of some species are in danger of being depleted due to overfishing.

Aquaculture provides an alternative by allowing farmers to breed those same species in capacity and allow the wild population to revitalize. The incentives of less labor for more gains pushes fishers to convert to fish farmers and make even more profit that before. It also allows them control of the supply of the fish in the market giving them the ability to create surplus stock or reduce their production to reap the best profits available.

Importance of Aquaculture

1. Sustainable use of sea resources

Aquaculture provides alternatives for fishing from the sea. Increase in demand for food sources and increase in globalization has led to increase in fishing. Yet, this has led fishermen to become selfish and overfish the desired or high-demand species. Through aquaculture, it provides both an alternative and opportunity for wild stocks to replenish overtime.

2. Conservation of Biodiversity

Aquaculture also protects biodiversity by reducing the fishing activities on wild stock in their ecosystems. By providing alternatives to fishing, there is reduced attack on the wild populations of the various species in the sea. Reduced action of fishing saves the diversity of the aquatic ecosystem from extinction due to overfishing.

3. Increased Efficiency, more resources for less effort

Fish convert feed into body protein more efficiency than cattle or chicken production. It is much more efficient meaning that the fish companies make more food for less feed. Such efficiency means that less food and energy is used to produce food, meaning that the production process is cheaper as well. It saves resources and even allows for more food to be produced leading to secure reserves and less stress on the environment.

4. Reduced Environmental Disturbance

By Increasing aquaculture, fish farming in specific, there is a reduced need for the fishing of the wild stock. As an outcome, it puts less stress on the ecosystem and equally reduces human interference. Actions of motor boats and other human influences such as the removal of viable breeding adult fish are all stresses put on the aquatic ecosystems and their discontinuation allows the ecosystem to flourish and their natural balance.

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2019-20

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2. 20.3.20 F.N

AN OVERVIEW OF VANNAMEI SHRIMP CULTURE

PROJECT DONE BY

S.JYMAVATHI

III – B.SC., (2019-20)

DEPARTMENT OF ZOOLOGY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

A.S.D.GOVT DEGREE COLLEGE FOR WOMEN (A)

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2. 11.3.2020

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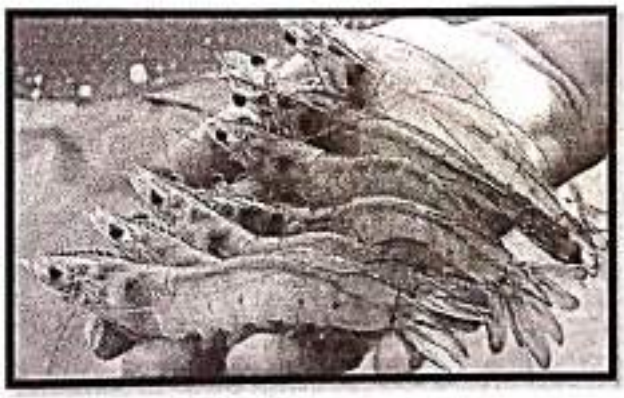
An overview of L . vannamei shrimp aquaculture

INTRODUCTION:

Litopenaeus vannamei is the most commonly cultured shrimp in Latin America and Southeast Asia, representing over 90 % of total Shrimp Production. India With its 8 118 km of coastline and 1.24 million Ha of brackish Water area is the second shrimp producer in the World, With Andhra Pradesh being India's largest vannamei farming area. Andhra Pradesh, situated on the southern coast of the country , has 974 km of coastline and 175,000 Ha of brackish Water. Andhra Pradesh has gradually increased its share in total marine exports of the country, With the United States and Vietnam as the main export markets.



Currently, the state's **L. vannamei aquaculture** is facing different issues and challenges to achieve sustainability related to diseases outbreaks, lack of availability of quality seed, high feed costs, unauthorized farming, international price fluctuations, less demand in the

domestic market, and others. If farmers implement better Management Practices (BMP) and **biosecurity** in L. vannamei culture supported by the Government policy measures then sustainability can be achieved. This article discusses the present culture practices, major problems, future perspectives and suggestive measures for **sustainable L. vannaimei farming** in Andhra Pradesh

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A brief history of L. vannamei:

Shrimp farming as an initiative of the Government of India (GoI) with a study of brackish water fish forming in the late 1970's. Due to the economic benefits from shrimp forming, the culture of penaeus monodon developed rapidly during the early 1990's. The intensification of culture systems and the lack of **biosecurity** led to disease outbreaks of **White Spot syndrome Virus (WSSV)** in 1994 the P. monodon culture almost collapsed in the late 1990's so in 1999 the fresh water prawn, 'scampi' Macrobrachium rosenbergii was introduced as an alternative to P. monodon. The 1990's are well known as the "era of virus disease" and Andhra Pradesh's **shrimp aquaculture** was not the exception.

In 2001 -2002, fresh water prawns faced severe disease outbreaks that affected the state's production significantly. This is when the **Litopenaeus vannamei** was proposed as an alternative species due to their disease resistance and tolerance to high stocking densities, low salinity and temperature, as well as their high growth rate. At the same time a risk analysis was carried out by the the Central Institute of Brackishwater Aquaculture (CIBA) and National Bureau of Fish Genetics and Resources (NBFGR) with the aim of evaluating the feasibility of the introduction of this new species.

After the experimental studies and due to the constant pressure of growers and traders for the introduction of L. vannamei due its potential in the export market, in 2009 the Coastal Aquaculture Authority (CAA) approved **vannamei culture** through import of Specific pathogen Free (SPF) brood stock and strict regulatory guidelines. In order to reduce the risk of adverse effects of the introduction of this exotic shrimp, the Rajiv Gandhi Center for Aquaculture (RGCA) created the "Aquatic Quarantine Facility of L. vannamei" (AQF) at the behest of Ministry of Agriculture, which is a state-of-the-art facility located in Chennai, Tamil Nadu for quarantine of L. vannamei broodstock imported to India.

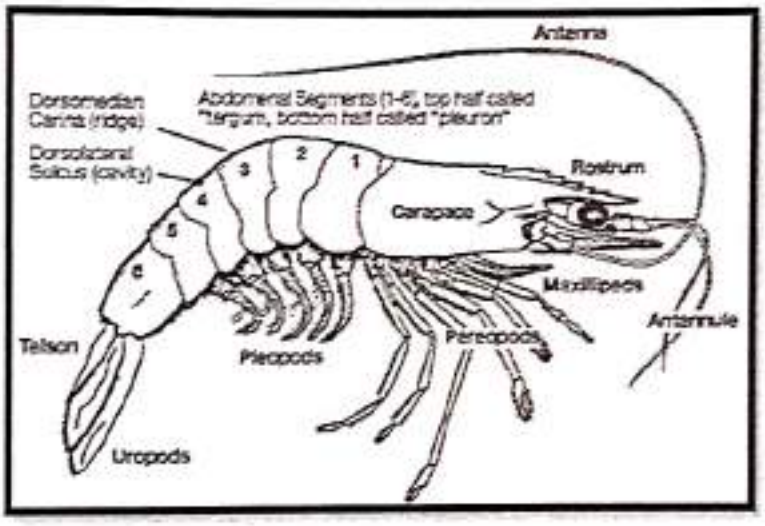
L. vannamei in Andhra Pradesh

For over 25 years, the P. monodon was the mainstay of India aquaculture but since L. vannamei's introduction in 2009, its production and culture area has gradually decreased while L. vannamei has increased.

Potential for development of L. vannamei culture

The production of L. vanamei shrimp is concentrated in East Godavari, West Godavari, Krishna, Prakasam and Nellore state districts. Andhra Pradesh produces more than half of the country's farmed shrimp and still has a lot of potential to exploit this resource by expanding culture to low salinity waters and through the rehabilitation of abandoned farms in Krishna district. Currently, Srikakulam (the northernmost district of the Andhra Pradesh Coastline) is considered as the state's shrimps farming.

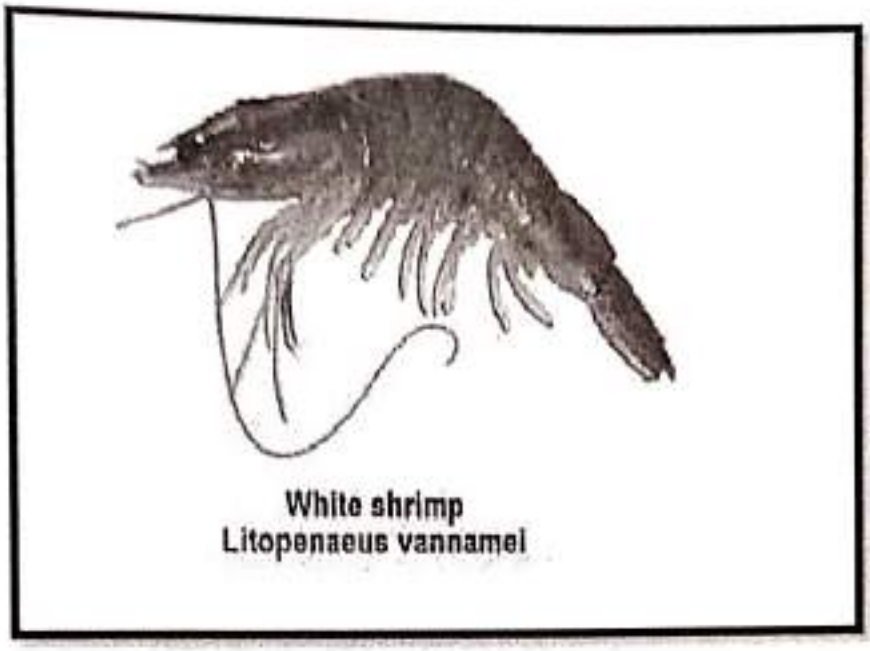
Nursery , culture and feeding practices



The CCA recommends a density of 60 shrimp/m2 but depending on the pond and soil conditions as well as the farmers' experience the culture densities vary, occasionally reaching 2,000,000 to 6,000,000 post Larvae (PL) per hectare. Prior to stocking, the pond is tested in order to maintain a pH of 6.5-7. The PL 10 -12 is regularly stocked in high salinities with more than 10 ppt, while PL 15 is stocked when the salinity is low. During the production cycle the water temperatures are maintained between 24-32°C and the Dissolved oxygen at 4-5 ppm. The culture cycle in the region range from 90-120 days and producers regularly have 2 cycle per year, with stocking in February-March and later in September-October. Shrimp of 17-19 grams are considered as a marketable size for the species. Currently the farmers are practicing partial harvests after 60-70 days of culture to overcome the slower growth rates of L. vannamei after reaching a size of 19 grams and the increase of operational cost as the days of culture increase. According to the Department of Fisheries of Andhra Pradesh the average production per hectare in the state is 3,000 to4,000 kg.

As a consequence of the intensification of L. vannamei culture systems in recent years, higher feed Conversion Ratios (FCR) have been registered, ranging from 1.5:1 to 1.8:1. The feeding frequency in the state is typically 2-4 times per day.

Challenges for sustainable L.vannamei farming



White shrimp
Litopenaeus vannamei

The growth of L. vannamei in the state has been impressive but for further expantion and sustainability the main issue is the lack of availability of quality seed from Specific Pathogen Free brood stock . By 2015, in Andhra Pradesh the CAA has given permission to 192 L. vannamei hatcheries and the Government of India permitted 17 hatcheries for nauplii rearing in facilities outside the jurisdiction of the CAA. For the last couple of years, L. vannamei farms started to develop their own brood stocks from grow out ponds and began producing seed; these seed are sold in the market as SPF and due to the lack of proper testing facilities is impossible for farmers to known the real quality of the seeds

and feed; as well as promote the implementation of best management practices and **biosecurity in shrimp culture.** The installation of reservoir ponds in L. vannamei farms should be a must, as well as effluent treatment. The government should incentivize the rehabilitation of abandoned shrimp farms and expansion of culture areas as well as promote the development of alternate species with culture systems and hatcheries for mud crabs, sea bass and cobia. Techniques for reducing bacterial loads in shrimp culture systems should be addressed, among other topics.

The Andhra Pradesh L. vannamei aquaculture sector is characterized by small-scale farms, therefore it is important to organize shrimp producers into farmer producer Organizations to provide technical support and training in Best Management practices and Biosecurity, as well as information about the national and international market.

Conclusions

The potential of shrimp culture in Andhra Pradesh is extraordinary, it generates a great number of direct and indirect jobs in the region, represents a great opportunity for rural development and brings a significant economic unpact. Thus it is important for all shrimp formers to practice responsible apiculture by only purchasing seed from authorized hatcheries, implementing strict biosecurity protocols and following strict quarantine measures and best management practices is culture systems. This way crop losses will be reduced, as will as the risk of disease outbreaks. Andhra Pradesh has the possibility to become an aquaculture hub in India, that's the reason why the State government has considered incentives and subsidies to foment quaculture and its sustainability.

A.S.D.GOVT DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

DEPARTMENT OF ZOOLOGY

CERTIFICATE

2019-20

Certified that the proposed work entitled **"Significance of fisheries and aquaculture"** is a bonafied work carried out by D. Satya Sri sixth semester project work under the supervision of **U.SATYANARAYANA**

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KAKINADA – 533002 , EAST GODAVARI , A.P.

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(Lecturer In-charge)

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2	1731006	Ch.Vimala Devi	III B.Sc, M.P.C	Soil Testing at Samalkot
3	1731007	Ch.Renuka	III B.Sc, M.P.C	Soil Testing at Samalkot
4	1731009	K.Pavani Satya	III B.Sc, M.P.C	Soil Testing at Samalkot
5	1731011	Madugula. Devi	III B.Sc, M.P.C	Soil Testing at Samalkot
6	1731012	M.Lakshmi Durga	III B.Sc, M.P.C	Soil Testing at Samalkot
7	1731014	Mosa.Mary	III B.Sc, M.P.C	Soil Testing at Samalkot
8	1731015	Ramadi.Dhana Satya Sri	III B.Sc, M.P.C	Soil Testing at Samalkot
9	1731016	P.Meghana	III B.Sc, M.P.C	Soil Testing at Samalkot
10	1731020	S.Veeralakshmi	III B.Sc, M.P.C	Soil Testing at Samalkot
11	1731022	B.Kavya.	III B.Sc, M.P.C	Soil Testing at Samalkot
12	1731027	G.Prasanna.	III B.Sc, M.P.C	Soil Testing at Samalkot
13	1731028	G.Uma Nageswari.	III B.Sc, M.P.C	Soil Testing at Samalkot
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16	1731032	K.Santhi.	III B.Sc, M.P.C	Soil Testing at Samalkot
17	1731034	K.Bagya Sri.	III B.Sc, M.P.C	Soil Testing at Samalkot

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19	1731036	P.Sunitha.	III B.Sc, M.P.C	Soil Testing at Samalkot
20	1731037	P.Srikala.	III B.Sc, M.P.C	Soil Testing at Samalkot
21	1731038	R.Prasanthi.	III B.Sc, M.P.C	Soil Testing at Samalkot
22	1731040	V.Bhargavi.	III B.Sc, M.P.C	Soil Testing at Samalkot
23	1733001	Ch.Suryakumari.	III B.Sc, C.B.Z	Soil Testing at Samalkot
24	1733031	P.Hema.	III B.Sc, C.B.Z	Soil Testing at Samalkot
25	1734001	P.Sai Sandhya.	III B.Sc, C.B.M.B	Soil Testing at Samalkot
26	1734002	P.Sai Sowjanya.	III B.Sc, C.B.M.B	Soil Testing at Samalkot
27	1734005	K.Mahalakshmi.	III B.Sc, C.B.M.B	Soil Testing at Samalkot
28	1734007	S.Sirisha	III B.Sc, C.B.M.B	Soil Testing at Samalkot
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P.S.D.GOVT.DEGREE COLLEGE (W) AUTONOMOUS KAKINADA

Signature of Incharge of Chemistry

Signature of Principal

Reg No :- 1731001

SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

"A Project report submitted on Cluster Elective VIII-A-3

Fulfilment of the requirement for the award of degree of"

BACHELOR OF SCIENCE

IN

CHEMISTRY

By

Name : G. Lakshmi Bhavani

Class : III B.Sc. (M.P.C)

Under the Esteemed Guidance of

Mrs. V. Anantha Lakshmi, M.Sc., M.Phil .,(Ph.D)

Lecturer in Chemistry

శ్రీ విద్యాప్రవర్ధకాం

DEPARTMENT OF CHEMISTRY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

2019-2020

10/3/2020

R. Suryanarayana

9/03/20

DECLARATION

I here by declare that the project entitled at **SOIL TESTING LABORATORY, Samalkot** bonafide work done by me under the guidance of **Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada.** To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to **A. S. D. Govt. Degree College for Women (A)** or any other Institution. The Project report is result of sincere efforts put in by me.

G. Lakshmi Bharani

DATE : 18/02/2020

PLACE : kakinada

CERTIFICATE

I here by declare that the project report entitled at **SOIL TESTING LABORATORY, Samalkot** is a bonafide work done by G. Lakshmi Bhavani under the guidance of **Mrs.V.Anantha Lakshmi, Lecturer in Chemistry** in the Cluster Elective VIII-A-3 fulfillment for the requirement for the award of the Bachelor of Science in Chemistry.

To the best of my knowledge similar work has not been submitted earlier, for the award of any degree to A.S.D. Govt. Degree College for Women (A) or any other Institution. The project report is result of sincere efforts in by

Signature of the Lecturer

Lecturer in Chemistry
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CONTENTS

CHAPTER-I
INTRODUCTION

INTRODUCTION

Soils are sampled to determine physical conditions, fertility (nutrient) status, and chemical properties that affect their suitability as plant growing media. Through a combination of field and green house project, analytical methods have been developed which provide quantitative estimates of plant-available nutrients. Field project determines the optimum soil test levels for various nutrients for specific soil and crop combinations. Optimum fertilizer practices can be determined by knowing the optimum test level of each nutrient for a specific crop and soil, and by knowing how much fertilizer is required to change soil test values.

Soil testing is comprised of four steps:

- Collection of a representative soil sample
- Laboratory analyses of the soil sample
- Interpretation of analytical results
- Management recommendations based on interpreted analytical results

➢ 1.1:Soil Sampling

The first and most critical step in soil testing is collecting a soil sample. A soil analysis can only be as good as the sample sent to the laboratory. It is important to recognize what a tiny portion of a field is actually analyzed in the laboratory. For example, a 1 lb soil sample collected from a 5 acre field represents just 1/10,000,000 of the field! Therefore, it is vital that the soil sample be representative of the entire field. The most common and economical method for sampling an area is composite sampling, where sub-samples are collected from randomly selected locations in a field, and the sub-samples are composited for analysis. The analytical results from composite sampling provide average values for the sampled area. The actual number of sub-samples depends on field size and uniformity. Generally, a larger field or a less uniform field should be more intensively

sampled than one that is small and uniform. No less than 5 sub-samples should be taken from a sampled area, and 15 to 25 are preferable.

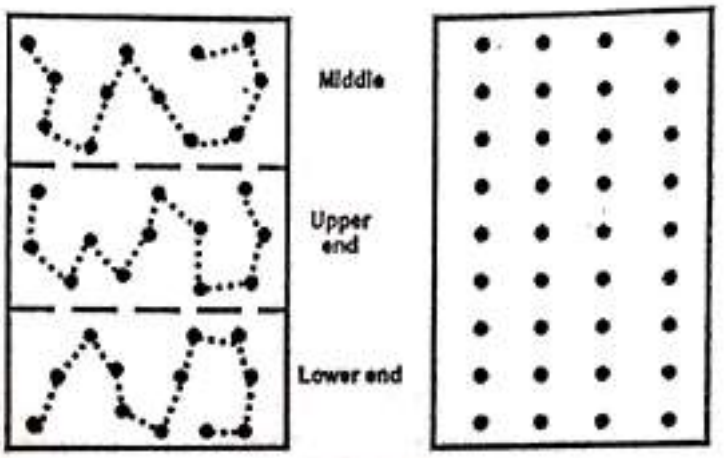
Alternatively, areas can be grid-sampled in a regular pattern. Each sample is analyzed separately, so that variability in soil properties can be determined. With data provided by grid sampling, maps of soil test values can be constructed. This information can be entered into a geographical information system (GIS) and combined with additional geospatial data, such as soil texture, crop yields, leaf analyses, etc. and used in precision agriculture systems for variable application of fertilizers and other crop inputs. This is a much more expensive method of soil analysis because of the large number of analyses required, although it provides valuable information about geospatial uniformity which can be used in precision agriculture.

Ideally, samples should be collected with a soil probe or auger (a small shovel or trowel can also be used), to the depth of tillage (usually 6 to 8 inches) or to the effective rooting depth of plants. Deeper samples may be collected for evaluation of subsoil properties, such as salt or nitrate accumulation. It is helpful to sample to the same depth each time a soil is sampled, so that year to year samples can be directly compared to monitor changes over time. Each sub-sample should be approximately equal in size. The sub-samples should be placed in a clean plastic bucket and mixed thoroughly. The desired sample amount is then removed from the bucket and the remainder discarded. Check with your testing laboratory to find out how large a sample they require.

The area or size of the field sampled is dependent upon management practices. Sample the smallest unit that will be managed separately. For example, if a field has two distinctly different sections, perhaps one half level and the other sloped, then sample the two areas separately, and fertilize each half separately to obtain optimum results. However, if each half of the area will not be fertilized or managed individually, there is no need for separate sampling. A single, representative sample will be less expensive and just as useful. Sample the smallest management unit.

Soil samples should be air-dried or taken to a test laboratory as soon as possible. To dry a soil sample, spread the soil out in a clean, warm, dry area, and let it dry for two to three days. It is

best not to heat or dry soil samples in an oven because soil chemical properties may be altered. Bag the sample and send it to a laboratory for analysis. Soil samples can be refrigerated for several days if they cannot be dried immediately



When is the best time of year to collect soil samples? Soil test values change slightly during the year, but the primary consideration for timing for most soil sample collection is convenience (nitrogen tests are an exception, see below). Collect samples early enough in the cropping cycle to allow results to be used to adjust management practices. How frequently should soil samples be collected? The frequency with which soil samples should be collected depends on the specific soil test, environmental conditions, and value of the crop. Status of some soil nutrients can change quickly, whereas others do not. For example, phosphorus levels in soil are unlikely to change rapidly and annual testing may be unnecessary. Nitrogen levels, on the other hand, change very quickly and frequent tests are required to obtain accurate determinations of plant-available levels. A new soil analysis might be necessary after heavy rains or after a prolonged period of water-logging if one needs an accurate measure of soil nitrogen.

When making substantial changes to soil fertility levels, it is a good idea to make the change over a period of two to three years, retesting the soil annually. If a crop does not have a high economic value, then occasional soil testing (once every 3 to 4 years) may be adequate in the absence of any noticeable nutritional problems. In contrast, commercial production of high value crops may warrant annual testing to ensure maximum yields.

CHAPTER-II
EXPERIMENTAL

2.1. Soil Analyses

After soil samples are received at a laboratory, a number of tests can be performed. A general understanding of soil testing will help you know how the results can be interpreted and to appreciate the accuracy of analytical results.

Soils supply most of the mineral nutrition for higher plants through the plant's root system. The root system extracts nutrients from the soil over a long period of time; two to three Months for most annual crops, years for perennial crops. In contrast, a soil test determines the soil's nutrient supplying capacity by mixing soil for only a few minutes with a strong extracting solution (often an acid or a combination of acids). The soil reacts with the extracting solution, releasing some of the nutrients. The solution is filtered and assayed for the concentration of each nutrient. The nutrient concentration is then related to field calibration research that indicates the yield level reached with varying soil nutrient concentrations. This method works very well for some nutrients, but is less accurate for others, for example those nutrients supplied largely from organic matter (OM) decomposition such as nitrogen and sulphur. This is primarily due to the difficulty of estimating or predicting the rate at which OM will decompose and release these nutrients in plant-available forms.

Individual analyses included in a 'standard' or 'routine' soil test varies from laboratory to laboratory, but generally include soil pH, and available phosphorus (P) and potassium (K). They sometimes also include available calcium (Ca) and magnesium (Mg), salinity, and often include an analysis of OM content and soil texture. Most laboratories offer nitrogen (N), sulphur (S), and micronutrient analyses for additional cost.

The methods used to test soils vary depending on chemical properties of the soil. For example, tests used for measuring soil P are quite different in the acidic soils common in the south eastern U.S. than those used in the alkaline soils of the southwest. Analysis of south-western soils with methods tailored for acidic soils will provide erroneous results. Therefore, it is important to be aware of the methods used by test labs, and to select methods that are regionally appropriate. Local laboratories will generally use methods appropriate for your soils and your laboratory should provide you with test method information. A listing of local

soil test laboratories may be found in the University of Arizona publication, "Laboratories Conducting Soil, Plant

Nutrient levels are usually expressed on a mass (weight) basis using units of parts per million (ppm). These can be converted to a molar basis by dividing ppm by the molecular weight to get mmol/L (for liquids) or mmol/kg (for solids). Another useful unit for expressing nutrients is centimoles of charge per kilogram of soil (cmolc/kg). To calculate cmolc/kg, divide ppm by the molecular weight and then multiply this value times the charge on the nutrient ion. Older literature uses meq/100g, which is identical to cmolc/kg.

2.2. STANDARD SOIL TESTS

2.2.1. PH:

Soil pH is a measure of the acidity or alkalinity of a soil. The term pH applies to solutions, so the analysis must be conducted on a soil/water mixture. The soil sample is mixed with water, allowed to equilibrate for at least an hour, and then the pH measured. Several factors affect pH measurement. Primary among these is the salt concentration of a soil (a salt is any molecule that, when placed in water, separates into positively and negatively charged components or ions). The salt concentration of a soil may vary with the season or with fertilizer application, and is generally greater immediately following Fertilizer application than before. The result may be an apparent pH drop up to one-half a pH unit.

When samples are collected frequently or at various times of the year it may be noted that pH values tend to increase and decrease, seemingly at random. This can lead to questions regarding the reliability of soil pH measurements, but the fluctuations may be due to changes in soil salt levels and do not usually present a serious problem in the use of the analysis. Some laboratories measure pH in a dilute salt solution to mask salt-induced variations. This method gives lower pH values for which the laboratory should provide interpretation guidelines.

2.2.2. Electrical Conductivity (EC)

Electrical conductivity (EC) of a soil extract is used to estimate the level of soluble salts. The standard method is to saturate the soil sample with water, vacuum filter to separate water from soil, and then measure EC of the saturated paste extract. The result is referred to as ECe and is expressed in units of deciSiemens per meter (dS/m). Older literature will likely use units of millimhos per centimeter (mmho/cm), which are identical to dS/m. Some test laboratories use different soil:water ratios, and use a multiplication factor to convert results to an EC equivalent.

2.2.3. Nitrogen (N)

Nitrogen analyses are not difficult to conduct, but interpreting results can be problematic. This is because a major portion of soil N is contained in the soil OM. Plant availability of organic N is dependent on OM breakdown, which is difficult to estimate. Therefore analyses of "total N", a sum of all forms of soil N, including organic N, are not routinely conducted. Instead, N in the nitrate form (NO3-N) is assayed. Nitrate is directly available to plants, so this test provides an indication of short term N availability. However, NO3-N can be quickly lost from soil, either leached past the rooting zone, or lost to the atmosphere in gaseous forms.

Nitrate analyses can provide an accurate determination of the N available to plants at the time of soil sampling, although this may not provide reliable information concerning N availability later in the growing season. If soil N analysis is to be used for making fertilizer recommendations, soil samples should be collected either shortly before planting time or during the growing season.

The extractant used to remove NO3-N from the soil is not particularly important because of its high solubility. Some laboratories extract NO3-N from soil with a salt solution, such as potassium chloride (KCl). However, other laboratories in the southwestern U.S. measure NO3-N in the same extract used to measure soil P (see below) to reduce analysis costs. Results from these two kinds of extractants are directly comparable.

2.2.4. Phosphorus (P):

Most soil P is tightly bound to soil particles or contained in relatively insoluble complexes. The P-containing complexes in alkaline soils are very different than those in neutral or acidic soils. The amount of P removed during soil extraction is very much dependent on the nature of P complexes and on the specific extractant used, so it is critical that P extractants be matched to soil properties.

The Olsen or bicarbonate extractant, a dilute sodium bicarbonate solution, is used to extract P from calcareous, alkaline, and neutral soils, and is appropriate for Arizona soils. In contrast, most other P extractants, such as the Mehlich extractants, are suited for acidic soils, and may not be suitable for arid-region soils. If an appropriate extractant is selected, P analysis is a reliable and useful soil test. On a soil test report, the analysis may be reported as PO4-P.

2.2.5. Potassium (K), Calcium (Ca), Magnesium (Mg), and Sodium (Na)

The four major exchangeable cations in arid-region soils are K, Ca, Mg, and Na. All except Na are essential plant nutrients, however Na is included here because it plays an important role in soil physical properties. Soil Na level is needed for calculations of cation exchange capacity (CEC) and exchangeable sodium percentage (ESP), discussed later.

An ammonium acetate extractant is used to extract exchangeable K, Ca, Mg, and Na from arid-region soils, but it does not extract less plant-available forms. Some difficulty may be encountered in soils containing Ca or Mg carbonates (calcareous soils) because the ammonium acetate extraction may remove some Ca or Mg from these minerals along with the exchangeable forms. In these situations, the analytical results may indicate slightly elevated levels of these nutrients. Some laboratories adjust the pH of the ammonium acetate extractant to 8.5 to minimize this error. However, this is not usually a large problem and K, Ca and Mg tests generally provide excellent estimates of plant available levels of these nutrients.

2.2.6. Cation Exchange Capacity (CEC)

Cation exchange capacity is often estimated by summing the major exchangeable cations (K, Ca, Mg, and Na) using units of cmolc/kg. Most laboratories do not routinely conduct a

separate analysis for CEC, but use the ammonium acetate extractable levels of these elements (discussed above) for this calculation.

2.2.7. Free Lime:

Free lime is a measure of soil carbonates (salts of CO_3^{2-}). When combined with an acid, carbonates release gaseous CO_2. The test usually performed for soil carbonates is semi-quantitative. A weak acid solution is applied to the soil sample, and the degree of 'fizzing' or release of CO_2 gas is determined visually and categorized as 'none', 'low', 'medium', or 'high'.

2.3. OPTIONAL SOIL TESTS

2.3.1. Sulfur (S):

Sulphur, like N, may be contained primarily in the soil OM, but plants absorb only the inorganic sulphate (SO_4^{2-}) form. Measuring total soil S does not provide a good estimate of S plant availability because rates of release from OM cannot be accurately predicted. Instead, S in the sulphate form is a more common measure. Sulphate can be extracted from the soil with several extractants, including water or weak salt solutions. Analysis of SO_4-S is relatively easy, but it usually provides a measure of immediately available S, and not the soil's long-term ability to provide S to a growing plant. Some desert soils contain large quantities of sulphates, in which case sulphate analysis gives a good indication of the soil's ability to supply S.

2.3.2. Micronutrients

Copper (Cu), Iron (Fe), Manganese (Mn), and Zinc (Zn):

Micronutrient analysis is optional at most laboratories. Most laboratories in our region use a DTPA-TEA (diethylenetriamine pentaacetic acid - triethanolamine) extractant which uses the chelating agent DTPA to extract available Fe, Cu, Mn, and Zn from soils.

Analyses of these micronutrients are probably less accurate for predicting the likelihood of plant deficiencies or of crop responses to supplemental application of these nutrients than analyses of macronutrients such as K, Ca, and Mg because of 1) the influence of dynamic soil conditions, and 2) the importance of genetically controlled plant micronutrient uptake

mechanisms. For example, Mn availability can change substantially if soil drainage status is altered, becoming more available in waterlogged soils, and less available in dry soils. Iron availability is also affected by soil moisture and irrigation practices. Furthermore, availability of Cu, Fe, Mn, and Zn are greatly affected by soil pH, so soils may need to be re-tested if soil pH is significantly altered. Soil testing cannot reliably predict the effects of altering management practices on availability of these nutrients. Additionally, plants vary considerably in their ability to extract metal micronutrients from soil. For example, it is not unusual for a tropical plant to exhibit iron deficiency while an adjacent desert adapted plant does

2.3.3. Boron (B):

The most common method of extracting B from soils is with hot water. This is an accurate test, but soil B levels can change rapidly. Boron is highly water soluble and can quickly be leached from the rooting zone, or moved laterally during monsoon rainfall events. Therefore, extractable soil B provides estimates of plant availability that are less reliable than those of many other nutrients, not because of shortcomings with the analytical method, but because of rapid B movement in the soil.

2.3.4. Molybdenum (Mo):

Few laboratories conduct soil Mo analysis. Molybdenum is present at very low levels in most soils, much lower than most of the other nutrients, making an accurate determination difficult. Most plants have a low requirement for Mo, and slight differences in soil Mo levels can impact plant performance. Therefore soil tests for Mo are of limited use and are seldom conducted.

2.3.5. Organic Matter (OM)

The OM level of a soil can be determined by several analytical techniques which are quite accurate. All measure the amount of soil OM or the carbon it contains, but most do not determine its nature or how it will contribute to soil fertility. Levels of nutrients contained in the soil OM can be determined, but usually are not because rates of mineralization (nutrient release) from OM which are influenced by weather and climate cannot be reliably predicted. Organic matter content is not routinely determined in southwestern soils because the levels are relatively low, and normally change very little.

CHAPTER-III

RESULTS

SOIL TEST RESULTS:

3.1.SAMPLE-1(KARAPA VILLAGE-EAST GODAVARI)

NAME OF THE LABORATORY: STL, SAMALKOT

S.No	Parameter	Test value	unit
1	pH	5.50	
2	EC	0.41	ds/m
3	Organic Carbon	0.87	%
4	Available Nitrogen(N)	188.16	Kg/Ha
5	Available Phosphorous (P)	4.01	Kg/Ha
6	Available Potassium(K)	304.72	Kg/Ha
7	Available Sulphur(s)	48.13	ppm
8	Available Zinc(Zn)	11.16	ppm
9	Available Boran(B)	1.76	ppm
10	Available Iron(Fe)	33.72	ppm
11	Available Manganese(Mn)	21.10	ppm
12	Available Copper(Cu)	7.95	ppm

Hectares (1Ha=1.000 Hectares)

ppm-Parts per million

3.2. SAMPLE-2(PEDAPUDI VILLAGE-EAST GODAVARI)

NAME OF THE LABORATORY: STL, SAMALKOT

S.No	Parameter	Test value	unit
1	pH	7.10	
2	EC	0.84	ds/m
3	Organic Carbon	0.87	%
4	Available Nitrogen(N)	263.40	Kg/Ha
5	Available Phosphorous (P)	24.69	Kg/Ha
6	Available Potassium(K)	542.10	Kg/Ha
7	Available Sulphur(s)	343.60	ppm
8	Available Zinc(Zn)	0.60	ppm
9	Available Boran(B)	2.35	ppm
10	Available Iron(Fe)	9.15	ppm
11	Available Manganese(Mn)	44.04	ppm
12	Available Copper(Cu)	1.63	ppm

Hectares (1Ha=1.000 Hectares)

ppm-Parts per million

3.3.SAMPLE-3(KAIKAVOLU VILLAGE-EAST GODAVARI)

NAME OF THE LABORATORY: STL, SAMALKOT

S.No	Parameter	Test value	unit
1	pH	7.00	
2	EC	0.68	ds/m
3	Organic Carbon	0.20	%
4	Available Nitrogen(N)	87.81	Kg/Ha
5	Available Phosphorous (P)	12.35	Kg/Ha
6	Available Potassium(K)	625.60	Kg/Ha
7	Available Sulphur(s)	14.94	ppm
8	Available Zinc(Zn)	0.93	ppm
9	Available Boran(B)	1.28	ppm
10	Available Iron(Fe)	4.36	ppm
11	Available Manganese(Mn)	45.58	ppm
12	Available Copper(Cu)	2.75	ppm

Hectares (1Ha=1.000 Hectares)

ppm-Parts per million

3.4.SAMPLE-4(PEDDADA VILLAGE-EAST GODAVARI)

NAME OF THE LABORATORY: STL, SAMALKOT

S.No	Parameter	Test value	unit
1	pH	7.10	
2	EC	0.84	ds/m
3	Organic Carbon	0.84	%
4	Available Nitrogen(N)	263.40	Kg/Ha
5	Available Phosphorous (P)	24.69	Kg/Ha
6	Available Potassium(K)	542.10	Kg/Ha
7	Available Sulphur(s)	343.60	ppm
8	Available Zinc(Zn)	0.60	ppm
9	Available Boran(B)	2.35	ppm
10	Available Iron(Fe)	9.15	ppm
11	Available Manganese(Mn)	44.04	ppm
12	Available Copper(Cu)	1.63	ppm

Hectares (1Ha=1.000 Hectares)

ppm-Parts per million

3.5 SAMPLE-5(TALAREVU VILLAGE-EAST GODAVARI)

NAME OF THE LABORATORY: STL, SAMALKOT

S.No	Parameter	Test value	unit
1	pH	7.00	
2	EC	0.64	ds/m
3	Organic Carbon	0.85	%
4	Available Nitrogen(N)	192.40	Kg/Ha
5	Available Phosphorous (P)	44.69	Kg/Ha
6	Available Potassium(K)	342.10	Kg/Ha
7	Available Sulphur(s)	247.60	ppm
8	Available Zinc(Zn)	0.73	ppm
9	Available Boran(B)	1.35	ppm
10	Available Iron(Fe)	19.15	ppm
11	Available Manganese(Mn)	42.04	ppm
12	Available Copper(Cu)	4.23	ppm

Hectares (1Ha=1.000 Hectares)

ppm-Parts per million

DISCUSSION

SUMMARY

Soil analyses can provide information that is important for maximizing nutrient use efficiency and agricultural productivity. A historical record of soil properties provided by long-term soil testing is useful for determining the effectiveness of fertilizer management strategies in maintaining soil fertility and sustainable agricultural productivity. Soil testing is also a useful tool for indentifying the causes of nutrient related plant growth problems.

Soil sampling is the critical first step in a soil testing program. The second is selection of a laboratory that will utilize analysis procedures appropriate for regional soils and conditions. However, an understanding of the accuracy and limitations of individual procedures and of the meaning of soil test results is essential. This publication provides information on these components of a soil testing program. The last steps, interpreting soil analysis values and developing a fertilizer management program, are crop specific and sometimes dependent on additional soil and climatic properties, and are beyond the scope of this document.

References:

Reg No: 1731006

SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

"A Project report submitted on Cluster Elective VIII-A-3

Fulfilment of the requirement for the award of degree of"

BACHELOR OF SCIENCE

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Under the Esteemed Guidance of

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Lecturer in Chemistry

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DEPARTMENT OF CHEMISTRY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

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DECLARATION

I here by declare that the project entitled at SOIL TESTING LABORATORY, Samalkot bonafide work done by me under the guidance of Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada. To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to A. S. D. Govt. Degree College for Women (A) or any other Institution. The Project report is result of sincere efforts put in by me.

Ch. Nivaka

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SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

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Ch. Bindu

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PLACE : Kakinada .

CERTIFICATE

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K. pavani satya

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10/03/20

DECLARATION

I here by declare that the project entitled at **SOIL TESTING LABORATORY, Samalkot** bonafide work done by me under the guidance of **Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada.** To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to **A. S. D. Govt. Degree College for Women (A)** or any other Institution. The Project report is result of sincere efforts put in by me.

DATE : 19/02/2020

PLACE : Kakinada

CERTIFICATE

I here by declare that the project report entitled at SOIL TESTING LABORATORY, Samalkot is a bonafide work done by

under the guidance of **Mrs.V.Anantha Lakshmi, Lecturer in Chemistry** in the Cluster Elective VIII-A-3 fulfillment for the requirement for the award of the Bachelor of Science in Chemistry.

To the best of my knowledge similar work has not been submitted earlier, for the award of any degree to A.S.D. Govt. Degree College for Women (A) or any other Institution. The project report is result of sincere efforts in by M. Devi

Signature of the Lecturer

Lecturer in Chemistry
A.S.D. Govt College for Women
KAKINADA

Signature of In-Charge

HEAD
DEPARTMENT OF CHEMISTRY
A.S.D. GOVT DEGREE COLLEGE (W)
JAGANNAICKPUR,
KAKINADA-533 007

1731012

SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

"A Project report submitted on Cluster Elective VIII-A-3

Fulfilment of the requirement for the award of degree of"

BACHELOR OF SCIENCE

IN

CHEMISTRY

By

Name : M. Lakshmi Durga

Class : III-BSC (MPC)

Under the Esteemed Guidance of

Mrs. V. Anantha Lakshmi, M.Sc., M.Phil .,(Ph.D)

Lecturer in Chemistry

విద్యాప్రవర్తకం

DEPARTMENT OF CHEMISTRY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

2019-2020

Verified by

R. Seeya Narayana

10/03/20

DECLARATION

I here by declare that the project entitled at **SOIL TESTING LABORATORY, Samalkot** bonafide work done by me under the guidance of **Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada.** To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to **A. S. D. Govt. Degree College for Women (A)** or any other Institution. The Project report is result of sincere efforts put in by me.

M. lakshmi Durga

DATE : 18-2-2020

PLACE : Kakinada

CERTIFICATE

I here by declare that the project report entitled at SOIL TESTING LABORATORY, Samalkot is a bonafide work done by M. Lakshmi Durga under the guidance of **Mrs.V.Anantha Lakshmi, Lecturer in Chemistry** in the Cluster Elective VIII-A-3 fulfillment for the requirement for the award of the Bachelor of Science in Chemistry.

To the best of my knowledge similar work has not been submitted earlier, for the award of any degree to A.S.D. Govt. Degree College for Women (A) or any other Institution. The project report is result of sincere efforts in by

Signature of the Lecturer

Lecturer in Chemistry
A.S.D. Govt College for Women
KAKINADA

Signature of In-Charge

HEAD
DEPARTMENT OF CHEMISTRY
A.S.D. GOVT. DEGREE COLLEGE
JAGANNAICKPUR
KAKINADA-533 00

1731014

SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

"A Project report submitted on Cluster Elective VIII-A-3

Fulfilment of the requirement for the award of degree of"

BACHELOR OF SCIENCE

IN

CHEMISTRY

By

Name : Mosa Mary

Class : III BSc (MPC)

Under the Esteemed Guidance of

Mrs. V. Anantha Lakshmi, M.Sc., M.Phil .,(Ph.D)

Lecturer in Chemistry

స్త్రీ విద్యా ప్రవర్ధతాం

DEPARTMENT OF CHEMISTRY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

2019-2020

10/3/2020

10/03/20

DECLARATION

I here by declare that the project entitled at **SOIL TESTING LABORATORY, Samalkot** bonafide work done by me under the guidance of **Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada.** To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to **A. S. D. Govt. Degree College for Women (A)** or any other Institution. The Project report is result of sincere efforts put in by me.

DATE : 20/12/2020

PLACE : kakinada

CERTIFICATE

I here by declare that the project report entitled at **SOIL TESTING LABORATORY, Samalkot** is a bonafide work done by M. Mosay under the guidance of **Mrs.V.Anantha Lakshmi, Lecturer in Chemistry** in the Cluster Elective VIII-A-3 fulfillment for the requirement for the award of the Bachelor of Science in Chemistry.

To the best of my knowledge similar work has not been submitted earlier, for the award of any degree to A.S.D. Govt. Degree College for Women (A) or any other Institution. The project report is result of sincere efforts in by

Signature of the Lecturer

Lecturer in Chemistry
A.S.D. Govt College for Women
KAKINADA

Signature of In-Charge

DEPARTMENT OF CHEMISTRY
A.S.D. GOVT DEGREE COLLEGE
JAGANNAICKPUR
KAKINADA-533 005

17310165

SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

"A Project report submitted on Cluster Elective VIII-A-3

Fulfilment of the requirement for the award of degree of"

BACHELOR OF SCIENCE

IN

CHEMISTRY

By

Name : Ravadi. Dhana Satya Sri

Class : III BSC MPC

Under the Esteemed Guidance of

Mrs. V. Anantha Lakshmi, M.Sc., M.Phil .,(Ph.D)

Lecturer in Chemistry

స్త్రీ విద్యా ప్రవర్ధకాం

DEPARTMENT OF CHEMISTRY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

2019-2020

20/8/2020.

R. Seeya Narayana

10/03/20

DECLARATION

I here by declare that the project entitled at **SOIL TESTING LABORATORY, Samalkot** bonafide work done by me under the guidance of **Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada.** To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to **A. S. D. Govt. Degree College for Women (A)** or any other Institution. The Project report is result of sincere efforts put in by me.

DATE : 19/02/2020

PLACE : Kakinada

CERTIFICATE

I here by declare that the project report entitled at **SOIL TESTING LABORATORY, Samalkot** is a bonafide work done by R. Dhana Satya Sri under the guidance of **Mrs.V.Anantha Lakshmi, Lecturer in Chemistry** in the Cluster Elective VIII-A-3 fulfillment for the requirement for the award of the Bachelor of Science in Chemistry.

To the best of my knowledge similar work has not been submitted earlier, for the award of any degree to A.S.D. Govt. Degree College for Women (A) or any other Institution. The project report is result of sincere efforts in by

Signature of the Lecturer

Lecturer in Chemistry
A.S. Govt College for Women
KAKINADA

Signature of In-Charge

HEAD
DEPARTMENT OF CHEMISTRY
A.S.D. GOVT DEGREE COLLEGE (W)
JAGANNAICKPUR
KAKINADA-533 005

17.3.2016

SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

"A Project report submitted on Cluster Elective VIII-A-3

Fulfilment of the requirement for the award of degree of"

BACHELOR OF SCIENCE

IN

CHEMISTRY

By

Name : P. Meghana

Class : III B.Sc (MPC)

Under the Esteemed Guidance of

Mrs. V. Anantha Lakshmi, M.Sc., M.Phil .,(Ph.D)

Lecturer in Chemistry

స్త్రీ విద్యాప్రవర్ధతాం

DEPARTMENT OF CHEMISTRY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

2019-2020

10/3/2020

DECLARATION

I here by declare that the project entitled at **SOIL TESTING LABORATORY, Samalkot** bonafide work done by me under the guidance of **Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada.** To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to **A. S. D. Govt. Degree College for Women (A)** or any other Institution. The Project report is result of sincere efforts put in by me.

DATE : 19/02/2020

PLACE : Kakinada.

CERTIFICATE

I here by declare that the project report entitled at **SOIL TESTING LABORATORY, Samalkot** is a bonafide work done by P. Meghana under the guidance of **Mrs.V.Anantha Lakshmi, Lecturer in Chemistry** in the Cluster Elective VIII-A-3 fulfillment for the requirement for the award of the Bachelor of Science in Chemistry.

To the best of my knowledge similar work has not been submitted earlier, for the award of any degree to A.S.D. Govt. Degree College for Women (A) or any other Institution. The project report is result of sincere efforts in by

Signature of the Lecturer

Lecturer in Chemistry
A.S.D. Govt. College for Women
KAKINADA

Signature of In-Charge

HEAD
DEPARTMENT OF CHEMISTRY
A.S.D. GOVT. DEGREE COLLEGE
JAGANNAICKPUR.
KAKINADA-533 005

1731020

SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

"A Project report submitted on Cluster Elective VIII-A-3

Fulfilment of the requirement for the award of degree of"

BACHELOR OF SCIENCE

IN

CHEMISTRY

By

Name : S. Veera lakshmi

Class : III. BSc (MPC)

Under the Esteemed Guidance of

Mrs. V. Anantha Lakshmi, M.Sc., M.Phil .,(Ph.D)

Lecturer in Chemistry

స్త్రీ విద్యా ప్రవర్ధతాం

DEPARTMENT OF CHEMISTRY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

2019-2020

DECLARATION

I here by declare that the project entitled at **SOIL TESTING LABORATORY, Samalkot** bonafide work done by me under the guidance of **Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada.** To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to **A. S. D. Govt. Degree College for Women (A)** or any other Institution. The Project report is result of sincere efforts put in by me.

S. veera lakshmi

DATE : 18 - 2 - 2020

PLACE : Kakinada

CERTIFICATE

I here by declare that the project report entitled at **SOIL TESTING LABORATORY, Samalkot** is a bonafide work done by S. Veera Lakshmi under the guidance of **Mrs.V.Anantha Lakshmi, Lecturer in Chemistry** in the Cluster Elective VIII-A-3 fulfillment for the requirement for the award of the Bachelor of Science in Chemistry.

To the best of my knowledge similar work has not been submitted earlier, for the award of any degree to A.S.D. Govt. Degree College for Women (A) or any other Institution. The project report is result of sincere efforts in by

Signature of the Lecturer 1/6/20
Lecturer in Chemistry
A.S.D. Govt. College
KAKINADA

Signature of In-Charge
HEAD
DEPARTMENT OF CHEMISTRY
A.S.D. GOVT. DEGREE COLLEGE
JAGANNAICKPUR
KAKINADA-533 [illegible]

Reg No:- 1731022

SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

"A Project report submitted on Cluster Elective VIII-A-3

Fulfilment of the requirement for the award of degree of"

BACHELOR OF SCIENCE

IN

CHEMISTRY

By

Name : B. Kavya

Class : III B.Sc (M.P.C)

Under the Esteemed Guidance of

Mrs. V. Anantha Lakshmi, M.Sc., M.Phil .,(Ph.D)

Lecturer in Chemistry

విద్యాప్రవర్ధకం

DEPARTMENT OF CHEMISTRY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

2019-2020

10/03/2020

10/03/20

DECLARATION

I here by declare that the project entitled at **SOIL TESTING LABORATORY, Samalkot** bonafide work done by me under the guidance of **Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada.** To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to **A. S. D. Govt. Degree College for Women (A)** or any other Institution. The Project report is result of sincere efforts put in by me.

DATE : 18/02/2020

PLACE : Kakinada

B. Kavya

CERTIFICATE

I here by declare that the project report entitled at **SOIL TESTING LABORATORY, Samalkot** is a bonafide work done by *B. Kavya* under the guidance of **Mrs.V.Anantha Lakshmi, Lecturer in Chemistry** in the Cluster Elective VIII-A-3 fulfillment for the requirement for the award of the Bachelor of Science in Chemistry.

To the best of my knowledge similar work has not been submitted earlier, for the award of any degree to A.S.D. Govt. Degree College for Women (A) or any other Institution. The project report is result of sincere efforts in by

Signature of the Lecturer

Lecturer in Chemistry
A.S.D. Govt. College for Women
KAKINADA

Signature of In-Charge

HEAD
DEPARTMENT OF CHEMISTRY
A.S.D. GOVT. DEGREE COLLEGE FOR
JAGANNAICKPUR.
KAKINADA-533 ...

1731027

SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

"A Project report submitted on Cluster Elective VIII-A-3 Fulfilment of the requirement for the award of degree of"

BACHELOR OF SCIENCE

IN

CHEMISTRY

By

Name : G. Prasanna

Class : III B.Sc [MPC].

Under the Esteemed Guidance of

Mrs. V. Anantha Lakshmi, M.Sc., M.Phil .,(Ph.D)

Lecturer in Chemistry

స్త్రీ విద్యా ప్రవర్ధతాం

DEPARTMENT OF CHEMISTRY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

2019-2020

Verified by

10/3/2020

10/3/20

DECLARATION

I here by declare that the project entitled at **SOIL TESTING LABORATORY, Samalkot** bonafide work done by me under the guidance of **Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada.** To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to **A. S. D. Govt. Degree College for Women (A)** or any other Institution. The Project report is result of sincere efforts put in by me.

DATE : 19/02/2020

PLACE : Kakinada.

CERTIFICATE

I here by declare that the project report entitled at **SOIL TESTING LABORATORY, Samalkot** is a bonafide work done by -G. Bhagavan.

under the guidance of **Mrs.V.Anantha Lakshmi, Lecturer in Chemistry** in the Cluster Elective VIII-A-3 fulfillment for the requirement for the award of the Bachelor of Science in Chemistry.

To the best of my knowledge similar work has not been submitted earlier, for the award of any degree to A.S.D. Govt. Degree College for Women (A) or any other Institution. The project report is result of sincere efforts in by

Signature of the Lecturer

Lecturer in Chemistry
A.S.D. Govt. College for Women
KAKINADA

Signature of In-Charge

HEAD
DEPARTMENT OF CHEMISTRY
A.S.D. GOVT. DEGREE COLLEGE
JAGANNAICKPUR
KAKINADA

Reg No : 1731025

SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

"A Project report submitted on Cluster Elective VIII-A-3

Fulfilment of the requirement for the award of degree of"

BACHELOR OF SCIENCE

IN

CHEMISTRY

By

Name : G. Uma Nageswari

Class : III . B.Sc [M.P.C]

Under the Esteemed Guidance of

Mrs. V. Anantha Lakshmi, M.Sc., M.Phil .,(Ph.D)

Lecturer in Chemistry

స్త్రీవిద్యాప్రవర్తకం

DEPARTMENT OF CHEMISTRY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

2019-2020

10/3/2020

R. Surya Narayana

10/03/20

DECLARATION

I here by declare that the project entitled at **SOIL TESTING LABORATORY, Samalkot** bonafide work done by me under the guidance of **Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada.** To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to **A. S. D. Govt. Degree College for Women (A)** or any other Institution. The Project report is result of sincere efforts put in by me.

G. Uma Nageswari

DATE : 15-2-2020

PLACE : Kakinada

CERTIFICATE

I here by declare that the project report entitled at **SOIL TESTING LABORATORY, Samalkot** is a bonafide work done by G. Uma Nageswari under the guidance of **Mrs.V.Anantha Lakshmi, Lecturer in Chemistry** in the Cluster Elective VIII-A-3 fulfillment for the requirement for the award of the Bachelor of Science in Chemistry.

To the best of my knowledge similar work has not been submitted earlier, for the award of any degree to A.S.D. Govt. Degree College for Women (A) or any other Institution. The project report is result of sincere efforts in by

Signature of the Lecturer 19/2/20

Lecturer in Chemistry
A.S.D. Govt College for Women
KAKINADA

Signature of In-Charge

HEAD
DEPARTMENT OF CHEMISTRY
A.S.D. GOVT. DEGREE COLLEGE (W)
JAGANNAICKPUR.
KAKINADA-533 005

17310.30

SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

"A Project report submitted on Cluster Elective VIII-A-3

Fulfilment of the requirement for the award of degree of"

BACHELOR OF SCIENCE

IN

CHEMISTRY

By

Name : K. Bhavanasri

Class : III B.Sc (MPC)

Under the Esteemed Guidance of

Mrs. V. Anantha Lakshmi, M.Sc., M.Phil .,(Ph.D)

Lecturer in Chemistry

శ్రీవిద్యాప్రవర్ధతాం

DEPARTMENT OF CHEMISTRY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

2019-2020

10/3/2020

10/03/20

DECLARATION

I here by declare that the project entitled at **SOIL TESTING LABORATORY, Samalkot** bonafide work done by me under the guidance of **Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada.** To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to **A. S. D. Govt. Degree College for Women (A)** or any other Institution. The Project report is result of sincere efforts put in by me.

DATE : 24/2/20

PLACE : Kakinada

CERTIFICATE

I here by declare that the project report entitled at **SOIL TESTING LABORATORY, Samalkot** is a bonafide work done by J. Bhavaneeswari under the guidance of **Mrs.V.Anantha Lakshmi, Lecturer in Chemistry** in the Cluster Elective VIII-A-3 fulfillment for the requirement for the award of the Bachelor of Science in Chemistry.

To the best of my knowledge similar work has not been submitted earlier, for the award of any degree to A.S.D. Govt. Degree College for Women (A) or any other Institution. The project report is result of sincere efforts in by

Signature of the Lecturer

Lecturer in Chemistry
A.S.D. Govt. College for
KAKINADA

Signature of In-Charge

HEAD
DEPARTMENT OF CHEMISTRY
A.S.D. GOVT. DEGREE COLLEGE
JAGANNAICKPUR
KAKINADA-53

Reg No: 1731031

SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

"A Project report submitted on Cluster Elective VIII-A-3

Fulfilment of the requirement for the award of degree of"

BACHELOR OF SCIENCE

IN

CHEMISTRY

By

Name : K. Bhulakshmi

Class : III BSc(MPC)

Under the Esteemed Guidance of

Mrs. V. Anantha Lakshmi, M.Sc., M.Phil .,(Ph.D)

Lecturer in Chemistry

విద్యాప్రమాణాలు

DEPARTMENT OF CHEMISTRY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

2019-2020

Verified by

10/3/2020.

R. Sreeja Narayana

10/03/20

DECLARATION

I here by declare that the project entitled at **SOIL TESTING LABORATORY, Samalkot** bonafide work done by me under the guidance of **Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada.** To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to **A. S. D. Govt. Degree College for Women (A)** or any other Institution. The Project report is result of sincere efforts put in by me.

DATE : 19/2/2020

PLACE : kakinada

K. Thulakshmi

CERTIFICATE

I here by declare that the project report entitled at **SOIL TESTING LABORATORY, Samalkot** is a bonafide work done by K. Bhulakshmi under the guidance of **Mrs.V.Anantha Lakshmi, Lecturer in Chemistry** in the Cluster Elective VIII-A-3 fulfillment for the requirement for the award of the Bachelor of Science in Chemistry.

To the best of my knowledge similar work has not been submitted earlier, for the award of any degree to A.S.D. Govt. Degree College for Women (A) or any other Institution. The project report is result of sincere efforts in by

Signature of the Lecturer
Lecturer in Chemistry
A.S.D. Govt. College for Women
KAKINADA

Signature of In-Charge
HEAD
DEPARTMENT OF CHEMISTRY
A.S.D. GOVT. DEGREE COLLEGE (W)
JAGANNAICKPUR.
KAKINADA-533 001

17731032

SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

"A Project report submitted on Cluster Elective VIII-A-3

Fulfilment of the requirement for the award of degree of"

BACHELOR OF SCIENCE

IN

CHEMISTRY

By

Name : K. Santhi

Class : III Bsc (MPC)

Under the Esteemed Guidance of

Mrs. V. Anantha Lakshmi, M.Sc., M.Phil .,(Ph.D)

Lecturer in Chemistry

స్త్రీ విద్యా ప్రవర్ధతాం

DEPARTMENT OF CHEMISTRY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

2019-2020

11/3/2020

11/03/20

DECLARATION

I here by declare that the project entitled at SOIL TESTING LABORATORY, Samalkot bonafide work done by me under the guidance of Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada. To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to A. S. D. Govt. Degree College for Women (A) or any other Institution. The Project report is result of sincere efforts put in by me.

K. Santhi

DATE: 18/02/2020

PLACE: Kakinada

CERTIFICATE

I here by declare that the project report entitled at **SOIL TESTING LABORATORY, Samalkot** is a bonafide work done by K. Santhi under the guidance of **Mrs.V.Anantha Lakshmi, Lecturer in Chemistry** in the Cluster Elective VIII-A-3 fulfillment for the requirement for the award of the Bachelor of Science in Chemistry.

To the best of my knowledge similar work has not been submitted earlier, for the award of any degree to A.S.D. Govt. Degree College for Women (A) or any other Institution. The project report is result of sincere efforts in by

Signature of the Lecturer

Lecturer in Chemistry
A.S.D. Govt College for Women
KAKINADA

2/2/2020

Signature of In-Charge

HEAD
DEPARTMENT OF CHEMISTRY
A.S.D. GOVT. DEGREE COLLEGE
JAGANNAICKPUR
KAKINADA-533 007

Regd No:- 17210234

SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

"A Project report submitted on Cluster Elective VIII-A-3 Fulfilment of the requirement for the award of degree of"

BACHELOR OF SCIENCE

IN

CHEMISTRY

By

Name : K. Bagya Sri

Class : III BSc [MPC]

Under the Esteemed Guidance of

Mrs. V. Anantha Lakshmi, M.Sc., M.Phil .,(Ph.D)

Lecturer in Chemistry

స్త్రీ విద్యా ప్రవర్ధతాం

DEPARTMENT OF CHEMISTRY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

2019-2020

11/3/20

R. Surya Narayana

11/03/20

DECLARATION

I here by declare that the project entitled at **SOIL TESTING LABORATORY, Samalkot** bonafide work done by me under the guidance of **Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada.** To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to **A. S. D. Govt. Degree College for Women (A)** or any other Institution. The Project report is result of sincere efforts put in by me.

DATE : 20-02-2020

PLACE : kakinada

CERTIFICATE

I here by declare that the project report entitled at **SOIL TESTING LABORATORY, Samalkot** is a bonafide work done by K. Bagya Sri under the guidance of **Mrs.V.Anantha Lakshmi, Lecturer in Chemistry** in the Cluster Elective VIII-A-3 fulfillment for the requirement for the award of the Bachelor of Science in Chemistry.

To the best of my knowledge similar work has not been submitted earlier, for the award of any degree to A.S.D. Govt. Degree College for Women (A) or any other Institution. The project report is result of sincere efforts in by

Signature of the Lecturer

Lecturer in Chemistry
A.S. Govt College for Women
KAKINADA

Signature of In Charge

DEPARTMENT OF CHEMISTRY
A.S.D. GOVT. DEGREE COLLEGE
JAGANNAICKPUR.
KAKINADA-533 5[illegible]

Reg No:- 1731035

SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

"A Project report submitted on Cluster Elective VIII-A-3

Fulfilment of the requirement for the award of degree of"

BACHELOR OF SCIENCE

IN

CHEMISTRY

By

Name : N. Satya Sai kumari.

Class : III B.Sc (M.P.C)

Under the Esteemed Guidance of

Mrs. V. Anantha Lakshmi, M.Sc., M.Phil .,(Ph.D)

Lecturer in Chemistry

శ్రీ విద్యా ప్రవర్ధకాం

DEPARTMENT OF CHEMISTRY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

2019-2020

11/03/20

11/03/20

DECLARATION

I here by declare that the project entitled at **SOIL TESTING LABORATORY, Samalkot** bonafide work done by me under the guidance of **Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada.** To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to **A. S. D. Govt. Degree College for Women (A)** or any other Institution. The Project report is result of sincere efforts put in by me.

N. Satya Sai kumari

DATE : 18/02/2020

PLACE : Kakinada

CERTIFICATE

I here by declare that the project report entitled at SOIL TESTING LABORATORY, Samalkot is a bonafide work done by N. Satya Sai kumar, under the guidance of **Mrs.V.Anantha Lakshmi, Lecturer in Chemistry** in the Cluster Elective VIII-A-3 fulfillment for the requirement for the award of the Bachelor of Science in Chemistry.

To the best of my knowledge similar work has not been submitted earlier, for the award of any degree to A.S.D. Govt. Degree College for Women (A) or any other Institution. The project report is result of sincere efforts in by

Signature of the Lecturer

Lecturer in Chemistry
A.S.D. Govt. College for Women
KAKINADA

Signature of In-Charge

DEPARTMENT OF CHEMISTRY
A.S.D. GOVT DEGREE COLLEGE FOR WOMEN
JAGANNAICKPUR
SAMALKOT-533 434

Reg No:- 1731036

SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

"A Project report submitted on Cluster Elective VIII-A-3

Fulfilment of the requirement for the award of degree of"

BACHELOR OF SCIENCE

IN

CHEMISTRY

By

Name : P. Sunitha

Class : III. B.Sc [M.P.C]

Under the Esteemed Guidance of

Mrs. V. Anantha Lakshmi, M.Sc., M.Phil.,(Ph.D)

Lecturer in Chemistry

స్త్రీ విద్యాప్రవర్ధతాం

DEPARTMENT OF CHEMISTRY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

2019-2020

17/3/20

11/03/20

DECLARATION

I here by declare that the project entitled at **SOIL TESTING LABORATORY, Samalkot** bonafide work done by me under the guidance of **Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada.** To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to **A. S. D. Govt. Degree College for Women (A)** or any other Institution. The Project report is result of sincere efforts put in by me.

DATE : 19/02/20

PLACE : Kakinada

P. Sumitha

CERTIFICATE

I here by declare that the project report entitled at **SOIL TESTING LABORATORY, Samalkot** is a bonafide work done by P. Swetha under the guidance of **Mrs.V.Anantha Lakshmi, Lecturer in Chemistry** in the Cluster Elective VIII-A-3 fulfillment for the requirement for the award of the Bachelor of Science in Chemistry.

To the best of my knowledge similar work has not been submitted earlier, for the award of any degree to A.S.D. Govt. Degree College for Women (A) or any other Institution. The project report is result of sincere efforts in by

Signature of the Lecturer

Lecturer in Chemistry
A.S.D. Govt. College for Women
KAKINADA

Signature of In-Charge

HEAD
DEPARTMENT OF CHEMISTRY
A.S.D. GOVT DEGREE COLLEGE FOR
JAGANNAICKPUR
KAKINADA-533 007

Reg. No. 1731037

SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

"A Project report submitted on Cluster Elective VIII-A-3

Fulfilment of the requirement for the award of degree of"

BACHELOR OF SCIENCE

IN

CHEMISTRY

By

Name : P. Srikala

Class : III BSC MPC

Under the Esteemed Guidance of

Mrs. V. Anantha Lakshmi, M.Sc., M.Phil .,(Ph.D)

Lecturer in Chemistry

స్త్రీ విద్యా ప్రవర్ధకం

DEPARTMENT OF CHEMISTRY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

2019-2020

11/3/2020

R. Suryanarayana

11/3/2020

DECLARATION

I here by declare that the project entitled at **SOIL TESTING LABORATORY, Samalkot** bonafide work done by me under the guidance of **Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada.** To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to **A. S. D. Govt. Degree College for Women (A)** or any other Institution. The Project report is result of sincere efforts put in by me.

P. Saikala

DATE : 19/2/2020

PLACE : Kakinada

CERTIFICATE

I here by declare that the project report entitled at **SOIL TESTING LABORATORY, Samalkot** is a bonafide work done by P. Sai Kala under the guidance of **Mrs.V.Anantha Lakshmi, Lecturer in Chemistry** in the Cluster Elective VIII-A-3 fulfillment for the requirement for the award of the Bachelor of Science in Chemistry.

To the best of my knowledge similar work has not been submitted earlier, for the award of any degree to A.S.D. Govt. Degree College for Women (A) or any other Institution. The project report is result of sincere efforts in by

Signature of the Lecturer 9/4/20

Lecturer in Chemistry
A.S.D. Govt. College for Women
KAKINADA

Signature of In-Charge 9/4/2020

HEAD
DEPARTMENT OF CHEMISTRY
A.S.D. GOVT. DEGREE COLLEGE
JAGANNAICKPUR
KAKINADA-533

Reg No :- 1731038

SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

"A Project report submitted on Cluster Elective VIII-A-3

Fulfilment of the requirement for the award of degree of"

BACHELOR OF SCIENCE

IN

CHEMISTRY

By

Name : R. prasanthi

Class : III BSC (MPC)

Under the Esteemed Guidance of

Mrs. V. Anantha Lakshmi, M.Sc., M.Phil .,(Ph.D)

Lecturer in Chemistry

శ్రీవిద్యాప్రవర్ధకాం

DEPARTMENT OF CHEMISTRY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

2019-2020

11/3/20

R. Sreenivasa Rao

11/3/20

DECLARATION

I here by declare that the project entitled at **SOIL TESTING LABORATORY, Samalkot** bonafide work done by me under the guidance of **Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada.** To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to **A. S. D. Govt. Degree College for Women (A)** or any other Institution. The Project report is result of sincere efforts put in by me.

DATE: 19/02/2020

PLACE: kakinada

R. prasanthi

CERTIFICATE

I here by declare that the project report entitled at **SOIL TESTING LABORATORY, Samalkot** is a bonafide work done by R. prasanthi under the guidance of **Mrs.V.Anantha Lakshmi, Lecturer in Chemistry** in the Cluster Elective VIII-A-3 fulfillment for the requirement for the award of the Bachelor of Science in Chemistry.

To the best of my knowledge similar work has not been submitted earlier, for the award of any degree to A.S.D. Govt. Degree College for Women (A) or any other Institution. The project report is result of sincere efforts in by

Signature of the Lecturer

Lecturer in Chemistry
A.S.D. Govt. College for Women
KAKINADA

Signature of In-Charge

HEAD
DEPARTMENT OF CHEMISTRY
A.S.D. GOVT. DEGREE COLLEGE FOR W
JAGANNAICKPUR
KAKINADA-533 005

Reg.no:- 173040

SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

"A Project report submitted on Cluster Elective VIII-A-3

Fulfilment of the requirement for the award of degree of"

BACHELOR OF SCIENCE

IN

CHEMISTRY

By

Name : V. Bhargavi

Class : III B.Sc (MPC)

Under the Esteemed Guidance of

Mrs. V. Anantha Lakshmi, M.Sc., M.Phil .,(Ph.D)

Lecturer in Chemistry

స్త్రీ విద్యా ప్రవర్ధతాం

DEPARTMENT OF CHEMISTRY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

2019-2020

11/3/2020

R. Seeyadri 11/03/20

DECLARATION

I here by declare that the project entitled at **SOIL TESTING LABORATORY, Samalkot** bonafide work done by me under the guidance of **Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada.** To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to **A. S. D. Govt. Degree College for Women (A)** or any other Institution. The Project report is result of sincere efforts put in by me.

DATE : 19/02/2020

PLACE : Kakinada.

CERTIFICATE

I here by declare that the project report entitled at SOIL TESTING LABORATORY, Samalkot is a bonafide work done by

under the guidance of **Mrs.V.Anantha Lakshmi, Lecturer in Chemistry** in the Cluster Elective VIII-A-3 fulfillment for the requirement for the award of the Bachelor of Science in Chemistry.

To the best of my knowledge similar work has not been submitted earlier, for the award of any degree to A.S.D. Govt. Degree College for Women (A) or any other Institution. The project report is result of sincere efforts in by V. Bhargavi

Signature of the Lecturer

Lecturer in Chemistry
A.S.D. Govt. College for Women
KAKINADA

Signature of In-Charge

HEAD
DEPARTMENT OF CHEMISTRY
A.S.D. GOVT. DEGREE COLLEGE FOR WOMEN
JAGANNAICKPUR
KAKINADA-533 005

REGD No: 1734002

SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

"A Project report submitted on Cluster Elective VIII-A-3

Fulfilment of the requirement for the award of degree of"

BACHELOR OF SCIENCE

IN

CHEMISTRY

By

Name : P. Sai Samanya

Class : III- BSc (CBMB)

Under the Esteemed Guidance of

Mrs. V. Anantha Lakshmi, M.Sc., M.Phil .,(Ph.D)

Lecturer in Chemistry

స్త్రీ విద్యాప్రవర్ధకం

DEPARTMENT OF CHEMISTRY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

2019-2020

11/3/20

R. Sunadalakshmi

11/03/20

DECLARATION

I here by declare that the project entitled at **SOIL TESTING LABORATORY, Samalkot** bonafide work done by me under the guidance of **Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada.** To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to **A. S. D. Govt. Degree College for Women (A)** or any other Institution. The Project report is result of sincere efforts put in by me.

DATE : 20-2-20

PLACE : Kakinada

C

CERTIFICATE

I here by declare that the project report entitled at **SOIL TESTING LABORATORY, Samalkot** is a bonafide work done by

under the guidance of **Mrs.V.Anantha Lakshmi, Lecturer in Chemistry** in the Cluster Elective VIII-A-3 fulfillment for the requirement for the award of the Bachelor of Scicnce in Chemistry.

To the best of my knowledge similar work has not been submitted earlier, for the award of any degree to A.S.D. Govt. Degree College for Women (A) or any other Institution. The project report is result of sincere efforts in by

Signature of the Lecturer in Chemistry
A.S. Govt College for Women
KAKINADA

Signature of In-Charge
DEPARTMENT OF CHEMISTRY
A.S.D. GOVT DEGREE COLLEGE (W)
JAGANNAICKPUR
KAKINADA-533 001

SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

"A Project report submitted on Cluster Elective VIII-A-3

Fulfilment of the requirement for the award of degree of"

BACHELOR OF SCIENCE

IN

CHEMISTRY

By

Name : K. Mahalakshmi

Class : III B.Sc CBMB

Under the Esteemed Guidance of

Mrs. V. Anantha Lakshmi, M.Sc., M.Phil .,(Ph.D)

Lecturer in Chemistry

స్త్రీ విద్యా ప్రవర్ధకాం

DEPARTMENT OF CHEMISTRY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

2019-2020

11/3/2020

DECLARATION

I here by declare that the project entitled at **SOIL TESTING LABORATORY, Samalkot** bonafide work done by me under the guidance of **Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada.** To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to **A. S. D. Govt. Degree College for Women (A)** or any other Institution. The Project report is result of sincere efforts put in by me.

DATE: 20-02-2020

PLACE: Kakinada.

CERTIFICATE

I here by declare that the project report entitled at **SOIL TESTING LABORATORY, Samalkot** is a bonafide work done by

under the guidance of **Mrs.V.Anantha Lakshmi, Lecturer in Chemistry** in the Cluster Elective VIII-A-3 fulfillment for the requirement for the award of the Bachelor of Science in Chemistry.

To the best of my knowledge similar work has not been submitted earlier, for the award of any degree to A.S.D. Govt. Degree College for Women (A) or any other Institution. The project report is result of sincere efforts in by

Signature of the Lecturer in Charge

Signature of the Head of the Department

DEPARTMENT OF CHEMISTRY
A.S.D. GOVT. DEGREE COLLEGE FOR W
JAGANNAICKPUR.
KAKINADA-533 005

Redg No:- 1734007

SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

"A Project report submitted on Cluster Elective VIII-A-3 Fulfilment of the requirement for the award of degree of"

BACHELOR OF SCIENCE

IN

CHEMISTRY

By

Name : P. Sirisha

Class : III BSC CBMB

Under the Esteemed Guidance of

Mrs. V. Anantha Lakshmi, M.Sc., M.Phil .,(Ph.D)

Lecturer in Chemistry

స్త్రీవిద్యాప్రవర్తతాం

DEPARTMENT OF CHEMISTRY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

2019-2020

11/3/20

DECLARATION

I here by declare that the project entitled at **SOIL TESTING LABORATORY, Samalkot** bonafide work done by me under the guidance of **Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada.** To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to **A. S. D. Govt. Degree College for Women (A)** or any other Institution. The Project report is result of sincere efforts put in by me.

DATE : 20/2/2020

PLACE : kakinada

C

CERTIFICATE

I here by declare that the project report entitled at **SOIL TESTING LABORATORY, Samalkot** is a bonafide work done by

under the guidance of **Mrs.V.Anantha Lakshmi, Lecturer in Chemistry** in the Cluster Elective VIII-A-3 fulfillment for the requirement for the award of the Bachelor of Science in Chemistry.

To the best of my knowledge similar work has not been submitted earlier, for the award of any degree to A.S.D. Govt. Degree College for Women (A) or any other Institution. The project report is result of sincere efforts in by

Signature of the Lecturer

Lecturer in Chemistry
A.S. Govt. College for Women
KAKINADA

Signature of In Charge

HEAD
DEPARTMENT OF CHEMISTRY
A.S.D. GOVT DEGREE COLLEGE FOR WOMEN
JAGANNAICKPUR
KAKINADA-533 005

SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

"A Project report submitted on Cluster Elective VIII-A-3

Fulfilment of the requirement for the award of degree of"

BACHELOR OF SCIENCE

IN

CHEMISTRY

By

Name : S. Savika

Class : III BSc[CBMB]

Under the Esteemed Guidance of

Mrs. V. Anantha Lakshmi, M.Sc., M.Phil .,(Ph.D)

Lecturer in Chemistry

శ్రీ విద్యాప్రవర్ధతాం

DEPARTMENT OF CHEMISTRY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

2019-2020

11/3/2020

R. Sreedharayana
11/03/20

DECLARATION

I here by declare that the project entitled at SOIL TESTING LABORATORY, Samalkot bonafide work done by me under the guidance of **Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada.** To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to **A. S. D. Govt. Degree College for Women (A)** or any other Institution. The Project report is result of sincere efforts put in by me.

DATE : 20-2-20

PLACE : Kakinada

CERTIFICATE

I here by declare that the project report entitled at **SOIL TESTING LABORATORY, Samalkot** is a bonafide work done by

under the guidance of **Mrs.V.Anantha Lakshmi, Lecturer in Chemistry** In the Cluster Elective VIII-A-3 fulfillment for the requirement for the award of the Bachelor of Science in Chemistry.

To the best of my knowledge similar work has not been submitted earlier, for the award of any degree to A.S.D. Govt. Degree College for Women (A) or any other Institution. The project report is result of sincere efforts in by

Signature of the Lecturer 20/2/20.

Lecturer in Chemistry
A.S. Govt College for Women
KAKINADA

Signature of the Head 20/2/2020

HEAD
DEPARTMENT OF CHEMISTRY
A.S.D. GOVT. DEGREE COLLEGE (W)
JAGANNAICKPUR
KAKINADA-533 101

Reg.No:-1734001

SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

"A Project report submitted on Cluster Elective VIII-A-3

Fulfilment of the requirement for the award of degree of"

BACHELOR OF SCIENCE

IN

CHEMISTRY

By

Name : P. sai sandhya

Class : III BSc CBmB

Under the Esteemed Guidance of

Mrs. V. Anantha Lakshmi, M.Sc., M.Phil .,(Ph.D)

Lecturer in Chemistry

స్త్రీ విద్యాప్రవర్ధతాం

DEPARTMENT OF CHEMISTRY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

2019-2020

11/3/2020

11/03/20

DECLARATION

I here by declare that the project entitled at **SOIL TESTING LABORATORY, Samalkot** bonafide work done by me under the guidance of **Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada.** To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to **A. S. D. Govt. Degree College for Women (A)** or any other Institution. The Project report is result of sincere efforts put in by me.

DATE : 20-2-20

PLACE : Kakinada

CERTIFICATE

I here by declare that the project report entitled at **SOIL TESTING LABORATORY, Samalkot** is a bonafide work done by

under the guidance of **Mrs.V.Anantha Lakshmi, Lecturer in Chemistry** in the Cluster Elective VIII-A-3 fulfillment for the requirement for the award of the Bachelor of Scicnce in Chemistry.

To the best of my knowledge similar work has not been submitted earlier, for the award of any degree to A.S.D. Govt. Degree College for Women (A) or any other Institution. The project report is result of sincere efforts in by

Signature of the Lecturer
A.S. Govt College for Women
KAKINADA

22/12/2020
Signature of In-Charge
DEPARTMENT OF CHEMISTRY
A.S.D. GOVT DEGREE COLLEGE
JAGANNAICKPUR
KAKINADA-533

Reddy's 1733031

SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

"A Project report submitted on Cluster Elective VIII-A-3

Fulfilment of the requirement for the award of degree of"

BACHELOR OF SCIENCE

IN

CHEMISTRY

By

Name : P. Hema

Class : III BSc [CBZ]

Under the Esteemed Guidance of

Mrs. V. Anantha Lakshmi, M.Sc., M.Phil .,(Ph.D)

Lecturer in Chemistry

స్త్రీ విద్యాప్రవర్ధకాం

DEPARTMENT OF CHEMISTRY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

2019-2020

11/3/2020.

R. Sreenivasa Rao

11/03/20

DECLARATION

I here by declare that the project entitled at **SOIL TESTING LABORATORY, Samalkot** bonafide work done by me under the guidance of **Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada.** To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to **A. S. D. Govt. Degree College for Women (A)** or any other Institution. The Project report is result of sincere efforts put in by me.

DATE : 20-02-2020

PLACE : Kakinada

C

CERTIFICATE

I here by declare that the project report entitled at **SOIL TESTING LABORATORY, Samalkot** is a bonafide work done by

under the guidance of **Mrs.V.Anantha Lakshmi, Lecturer in Chemistry** in the Cluster Elective VIII-A-3 fulfillment for the requirement for the award of the Bachelor of Science in Chemistry.

To the best of my knowledge similar work has not been submitted earlier, for the award of any degree to A.S.D. Govt. Degree College for Women (A) or any other Institution. The project report is result of sincere efforts in by

Signature of the Lecturer
A.S.D. Govt. College for Women
KAKINADA

Signature of In-Charge
HEAD
DEPARTMENT OF CHEMISTRY
A.S.D. GOVT. DEGREE COLLEGE FOR WOMEN
JAGANNAICKPUR
KAKINADA-533 005

Ch. Surya Kumari
III. B.Sc (CBZ)

No - 179001.

SOIL SAMPLING AND CHEMICAL ANALYSIS IN KAKINADA RURAL VILLAGES

"A Project report submitted on Cluster Elective VIII-A-3

Fulfilment of the requirement for the award of degree of"

BACHELOR OF SCIENCE

IN

CHEMISTRY

By

Name : CH. Surya Kumari

Class : III. B.Sc (CBZ)

Under the Esteemed Guidance of

Mrs. V. Anantha Lakshmi, M.Sc., M.Phil .,(Ph.D)

Lecturer in Chemistry

స్త్రీ విద్యాప్రవర్ధకం

DEPARTMENT OF CHEMISTRY

A.S.D.GOVT.DEGREE COLLEGE FOR WOMEN (A)

KAKINADA

2019-2020

11/3/2020

R. Surya Narayana

11/03/20

DECLARATION

I here by declare that the project entitled at **SOIL TESTING LABORATORY, Samalkot** bonafide work done by me under the guidance of **Mrs.V. Anantha Lakshmi, Lecturer in Chemistry, A. S. D. Govt. Degree College for Women (A), Kakinada.** To this best of my knowledge similar work has not been submitted earlier, for the award of any degree to **A. S. D. Govt. Degree College for Women (A)** or any other Institution. The Project report is result of sincere efforts put in by me.

DATE : 03/03/2020

PLACE : Kakinada

CERTIFICATE

I here by declare that the project report entitled at **SOIL TESTING LABORATORY, Samalkot** is a bonafide work done by Ch. Surya kumari under the guidance of **Mrs.V.Anantha Lakshmi, Lecturer in Chemistry** in the Cluster Elective VIII-A-3 fulfillment for the requirement for the award of the Bachelor of Science in Chemistry.

To the best of my knowledge similar work has not been submitted earlier, for the award of any degree to A.S.D. Govt. Degree College for Women (A) or any other Institution. The project report is result of sincere efforts in by

Signature of the Lecturer 21/12/2020.

Signature of In-Charge 2020

A.S.D GOVERNMENT DEGREE COLLEGE FOR WOMEN

KAKINADA

DEPARTMENT OF ECONOMICS

స్త్రీ విద్యాప్రవర్తతాం

PROJECT WORK

SUBMITTED BY:

NAME: SK. Kasima Sultana Begum
HT.NO: 1711004
GROUP: III BA(HEP)
TOPIC: Agriculture policy

TO

Dr.K.YAMUNA

A.S.D. Govt. Degree College for Women (Autonomous), Kakinada

(Accredited by NAAC with "B" in Cycle 3)

(Affiliated to Adikavi Nannayya University)

DEPARTMENT OF ECONOMICS

CERTIFICATE

This is to be certified that the study project

Agriculture policy done by Sk. Karima Sultana Begum of III B,A. (H.E.P) under the guidance of Dr K.Yamuna,Lecturer in Economics in A.S.D. Government Degree College for Women (A), Kakinada during the year 2019-20. The project carried out by the students is satisfactory.

K. Yamuna
Signature of the faculty

K. Yamuna
Signature of the In-charge

Signature of the Principal

A.S.D GOVERNMENT DEGREE COLLEGE FOR WOMEN

KAKINADA

DEPARTMENT OF ECONOMICS

స్త్రీ విద్యాప్రవర్తతాం

PROJECT WORK

SUBMITTED BY:

NAME: S. Kanaka Dhareswari

HT.NO: 1711011

GROUP: III. B.A (H.E.P)

TOPIC: Digital India

TO

Dr.K.YAMUNA

A.S.D. Govt. Degree College for Women (Autonomous), Kakinada

(Accredited by NAAC with "B" in Cycle 3)

(Affiliated to Adikavi Nannayya University)

DEPARTMENT OF ECONOMICS

CERTIFICATE

This is to be certified that the study project

Digital India done by S. Kanaka Dhareswari of

III B,A. (H.E.P) under the guidance of Dr K.Yamuna,Lecturer in Economics in A.S.D. Government Degree College for Women (A), Kakinada during the year 2019-20. The project carried out by the students is satisfactory.

K. Yamuna
Signature of the faculty

K. Yamuna
Signature of the In-charge

Signature of the Principal

A.S.D GOVERNMENT DEGREE COLLEGE FOR WOMEN
KAKINADA

DEPARTMENT OF ECONOMICS

స్త్రీ విద్యా ప్రవర్ధతాం

PROJECT WORK

SUBMITTED BY:

NAME: Ch. Dilip
HT.NO: 1711018
GROUP: III B.A [H.E.P]
TOPIC: Indian agriculture

TO
Dr.K.YAMUNA

A.S.D. Govt. Degree College for Women (Autonomous), Kakinada

(Accredited by NAAC with "B" in Cycle 3)

(Affiliated to Adikavi Nannayya University)

DEPARTMENT OF ECONOMICS

CERTIFICATE

This is to be certified that the study project

Indian agriculture done by Ch. Divya of

III B,A. (H.E.P) under the guidance of Dr K.Yamuna,Lecturer in Economics in A.S.D. Government Degree College for Women (A), Kakinada during the year 2019-20. The project carried out by the students is satisfactory.

K. Yamuna
Signature of the faculty

K. Yamuna
Signature of the In-charge

Signature of the Principal

A.S.D GOVERNMENT DEGREE COLLEGE FOR WOMEN

KAKINADA

DEPARTMENT OF ECONOMICS

స్త్రీ విద్యాప్రవర్ధతాం

PROJECT WORK

SUBMITTED BY:

NAME: D. Rama lakshmi
HT.NO: 1711020
GROUP: III B.A (HEP)
TOPIC: G.S.T - Goods and service tax

TO

Dr.K.YAMUNA

A.S.D. Govt. Degree College for Women (Autonomous), Kakinada

(Accredited by NAAC with "B" in Cycle 3)

(Affiliated to Adikavi Nannayya University)

DEPARTMENT OF ECONOMICS

CERTIFICATE

This is to be certified that the study project (G.S.T) Goods and Service tax done by D. Rama Lakshmi of III B.A. (H.E.P) under the guidance of Dr K.Yamuna,Lecturer in Economics in A.S.D. Government Degree College for Women (A), Kakinada during the year 2019-20. The project carried out by the students is satisfactory.

K. Yamuna
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K. Yamuna
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Signature of the Principal

A.S.D GOVERNMENT DEGREE COLLEGE FOR WOMEN
KAKINADA

DEPARTMENT OF ECONOMICS

స్త్రీ విద్యా ప్రవర్ధకాం

PROJECT WORK

SUBMITTED BY:

NAME: DoKala. Maha LaKshmi
HT.NO: 1711022
GROUP: III B.A [H.E.P]
TOPIC: Inflation

TO
Dr.K.YAMUNA

A.S.D. Govt. Degree College for Women (Autonomous), Kakinada

(Accredited by NAAC with "B" in Cycle 3)

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DEPARTMENT OF ECONOMICS

CERTIFICATE

This is to be certified that the study project on

" Inflation " done by Dokala. Mahalakshmi of

III B.A. (H.E.P) under the guidance of Dr K.Yamuna,Lecturer in Economics in A.S.D. Government Degree College for Women (A), Kakinada during the year 2019-20. The project carried out by the students is satisfactory.

K. Yamuna

Signature of the faculty

K. Yamuna

Signature of the In-charge

Signature of the Principal

A.S.D GOVERNMENT DEGREE COLLEGE FOR WOMEN

KAKINADA

DEPARTMENT OF ECONOMICS

స్త్రీ విద్యాప్రవర్ధతాం

PROJECT WORK

SUBMITTED BY:

NAME: K. Sandhya Devi
HT.NO: 1711027
GROUP: III BA(HEP)
TOPIC: Cooperative Marketing

TO

Dr.K.YAMUNA

A.S.D. Govt. Degree College for Women (Autonomous), Kakinada

(Accredited by NAAC with "B" in Cycle 3)

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DEPARTMENT OF ECONOMICS

CERTIFICATE

This is to be certified that the study project

Cooperative Marketing done by K. Sandhya Devi of III B.A. (H.E.P) under the guidance of Dr K.Yamuna,Lecturer in Economics in A.S.D. Government Degree College for Women (A), Kakinada during the year 2019-20. The project carried out by the students is satisfactory.

K. Yamuna
Signature of the faculty

K. Yamuna
Signature of the In-charge

Signature of the Principal

A.S.D GOVERNMENT DEGREE COLLEGE FOR WOMEN
KAKINADA

DEPARTMENT OF ECONOMICS

స్త్రీ విద్యా ప్రవర్తతాం

PROJECT WORK

SUBMITTED BY:

NAME: O. Sasya Syamala
HT.NO: 1711042
GROUP: III B.A [H.E.P]
TOPIC: Organic Farming

TO
Dr.K.YAMUNA

A.S.D. Govt. Degree College for Women (Autonomous), Kakinada

(Accredited by NAAC with "B" in Cycle 3)

(Affiliated to Adikavi Nannayya University)

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CERTIFICATE

This is to be certified that the study project on organic farming done by O. Sasya Syamala of III B.A. (H.E.P) under the guidance of Dr K.Yamuna,Lecturer in Economics in A.S.D. Government Degree College for Women (A), Kakinada during the year 2019-20. The project carried out by the students is satisfactory.

K. Yamuna
Signature of the faculty

K. Yamuna
Signature of the In-charge

Signature of the Principal

A.S.D GOVERNMENT DEGREE COLLEGE FOR WOMEN
KAKINADA

DEPARTMENT OF ECONOMICS

స్త్రీ విద్యా ప్రవర్ధతాం

PROJECT WORK

SUBMITTED BY:

NAME: Penumala. vara Lakshmi
HT.NO: 1711043
GROUP: III B.A (H.E.P)
TOPIC: (F.D.I) భారత (పత్యక్ష పెట్టుబడి

TO
Dr.K.YAMUNA

A.S.D. Govt. Degree College for Women (Autonomous), Kakinada

(Accredited by NAAC with "B" in Cycle 3)

(Affiliated to Adikavi Nannayya University)

DEPARTMENT OF ECONOMICS

CERTIFICATE

This is to be certified that the study project (FDI) foreign Direct Investment done by P. vara Lakshmi of III B.A. (H.E.P) under the guidance of Dr K.Yamuna,Lecturer in Economics in A.S.D. Government Degree College for Women (A), Kakinada during the year 2019-20. The project carried out by the students is satisfactory.

K. యమున

Signature of the faculty

K. యమున

Signature of the In-charge

Signature of the Principal

A.S.D GOVERNMENT DEGREE COLLEGE FOR WOMEN

KAKINADA

DEPARTMENT OF ECONOMICS

స్త్రీ విద్యాప్రవర్ధతాం

PROJECT WORK

SUBMITTED BY:

NAME: P. Syamala Rani
HT.NO: 1741044
GROUP: III B.A (M.E.P)
TOPIC: Indian Economy Agriculture

TO

Dr.K.YAMUNA

A.S.D. Govt. Degree College for Women (Autonomous), Kakinada

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(Affiliated to Adikavi Nannayya University)

DEPARTMENT OF ECONOMICS

CERTIFICATE

This is to be certified that the study project Indian Economy - Agriculture done by P. Syamala Rani of III B,A. (H.E.P) under the guidance of Dr K.Yamuna,Lecturer in Economics in A.S.D. Government Degree College for Women (A), Kakinada during the year 2019-20. The project carried out by the students is satisfactory.

Signature of the faculty

Signature of the In-charge

Signature of the Principal

A.S.D GOVERNMENT DEGREE COLLEGE FOR WOMEN

KAKINADA

DEPARTMENT OF ECONOMICS

స్త్రీ విద్యా ప్రవర్ధతాం

PROJECT WORK

SUBMITTED BY:

NAME: Pulidindi Sunidha
HT.NO: 1711045
GROUP: III BA [HEP]
TOPIC: Indian Agricultural policy

TO

Dr.K.YAMUNA

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(Affiliated to Adikavi Nannayya University)

DEPARTMENT OF ECONOMICS

CERTIFICATE

This is to be certified that the study project Indian – Agriculture Policy done by P. Sunitha of III B.A. (H.E.P) under the guidance of Dr K.Yamuna,Lecturer in Economics in A.S.D. Government Degree College for Women (A), Kakinada during the year 2019-20. The project carried out by the students is satisfactory.

K. Yamuna
Signature of the faculty

K. Yamuna
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Signature of the Principal

A.S.D GOVERNMENT DEGREE COLLEGE FOR WOMEN
KAKINADA

DEPARTMENT OF ECONOMICS

స్త్రీ విద్యా ప్రవర్ధతాం

PROJECT WORK

SUBMITTED BY:

NAME: Sode . Anusha
HT.NO: 1711046
GROUP: III B.A (H.E.P)
TOPIC: Indian economy Agriculture

TO
Dr.K.YAMUNA

A.S.D. Govt. Degree College for Women (Autonomous), Kakinada

(Accredited by NAAC with "B" in Cycle 3)

(Affiliated to Adikavi Nannayya University)

DEPARTMENT OF ECONOMICS

CERTIFICATE

This is to be certified that the study project Indian ECONOMY - Agriculture done by S. ANUSHA of III B,A. (H.E.P) under the guidance of Dr K.Yamuna,Lecturer in Economics in A.S.D. Government Degree College for Women (A), Kakinada during the year 2019-20. The project carried out by the students is satisfactory.

K. Yamuna
Signature of the faculty

K. Yamuna
Signature of the In-charge

Signature of the Principal

A.S.D GOVERNMENT DEGREE COLLEGE FOR WOMEN

KAKINADA

DEPARTMENT OF ECONOMICS

స్త్రీ విద్యాప్రవర్ధతాం

PROJECT WORK

SUBMITTED BY:

NAME: Seelam Esteru Jyothi
HT.NO: 171047
GROUP: IIIrd year BA HEP
TOPIC: హరిత విప్లవం (Green Revolution)

TO

Dr.K.YAMUNA

A.S.D. Govt. Degree College for Women (Autonomous), Kakinada

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(Affiliated to Adikavi Nannayya University)

DEPARTMENT OF ECONOMICS

CERTIFICATE

This is to be certified that the study project వంటింటి వైద్యం done by Seelam Esteru Jyothi of III B,A. (H.E.P) under the guidance of Dr K.Yamuna,Lecturer in Economics in A.S.D. Government Degree College for Women (A), Kakinada during the year 2019-20. The project carried out by the students is satisfactory.

K. Yamuna
Signature of the faculty

K. Yamuna
Signature of the In-charge

Signature of the Principal

A.S.D GOVERNMENT DEGREE COLLEGE FOR WOMEN

KAKINADA

DEPARTMENT OF ECONOMICS

స్త్రీ విద్యా ప్రవర్ధతాం

PROJECT WORK

SUBMITTED BY:

NAME: S. Rama SIVA
HT.NO: 1711048
GROUP: IIIrd BA HEP
TOPIC: Agriculture Indian Economy

TO

Dr.K.YAMUNA

A.S.D. Govt. Degree College for Women (Autonomous), Kakinada

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DEPARTMENT OF ECONOMICS

CERTIFICATE

This is to be certified that the study project

Agriculture Indian Economy done by S. Rama Siva of

III B.A. (H.E.P) under the guidance of Dr K.Yamuna,Lecturer in Economics in A.S.D. Government Degree College for Women (A), Kakinada during the year 2019-20. The project carried out by the students is satisfactory.

K. Yamuna
Signature of the faculty

K. Yamuna
Signature of the In-charge

Signature of the Principal

A.S.D GOVERNMENT DEGREE COLLEGE FOR WOMEN
KAKINADA

DEPARTMENT OF ECONOMICS

స్త్రీ విద్యాప్రవర్తతాం

PROJECT WORK

SUBMITTED BY:

NAME: TARAPUREDDY . MANGA
HT.NO: 1711049
GROUP: III BA [HEP]
TOPIC: Goods and Service Tax

TO
Dr.K.YAMUNA

A.S.D. Govt. Degree College for Women (Autonomous), Kakinada

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DEPARTMENT OF ECONOMICS

CERTIFICATE

[G.S.T] This is to be certified that the study project [G.S.T] Goods and Service Tax done by Tavaluriddy Monga of III B.A. (H.E.P) under the guidance of Dr K.Yamuna,Lecturer in Economics in A.S.D. Government Degree College for Women (A), Kakinada during the year 2019-20. The project carried out by the students is satisfactory.

K. yamuna
Signature of the faculty

K. yamuna
Signature of the In-charge

Signature of the Principal

A.S.D GOVERNMENT DEGREE COLLEGE FOR WOMEN

KAKINADA

DEPARTMENT OF ECONOMICS

స్త్రీ విద్యాప్రవర్ధతాం

PROJECT WORK

SUBMITTED BY:

NAME: Vanamadi. Parvathi
HT.NO: 1711051
GROUP: III BA (HEP)
TOPIC: RBI (Reserve Bank of India)

TO

Dr.K.YAMUNA

A.S.D. Govt. Degree College for Women (Autonomous), Kakinada

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DEPARTMENT OF ECONOMICS

CERTIFICATE

This is to be certified that the study project (Vanamadi. I) RBI (Resorve Bank of India) done by V. Parvathi of III B,A. (H.E.P) under the guidance of Dr K.Yamuna,Lecturer in Economics in A.S.D. Government Degree College for Women (A), Kakinada during the year 2019-20. The project carried out by the students is satisfactory.

K. Yamuna
Signature of the faculty

K. Yamuna
Signature of the In-charge

Signature of the Principal

A.S.D GOVERNMENT DEGREE COLLEGE FOR WOMEN
KAKINADA

DEPARTMENT OF ECONOMICS

స్త్రీ విద్యాప్రవర్ధతాం

PROJECT WORK

SUBMITTED BY:

NAME: Varamadi Venkata Lakshmi
HT.NO: 1711052
GROUP: III B.A H.E.P
TOPIC: Mahatma Gandhi National Rural Employment Guarantee Scheme (Act)

TO

Dr.K.YAMUNA

A.S.D. Govt. Degree College for Women (Autonomous), Kakinada

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(Affiliated to Adikavi Nannayya University)

DEPARTMENT OF ECONOMICS

CERTIFICATE

This is to be certified that the study project on Mahatma Gandhi National Rural Employment Guarantee (Act) Scheme done by Vanamadi Venkatalakshmi of III B,A. (H.E.P) under the guidance of Dr K.Yamuna,Lecturer in Economics in A.S.D. Government Degree College for Women (A), Kakinada during the year 2019-20. The project carried out by the students is satisfactory.

K. Yamuna
Signature of the faculty

K. Yamuna
Signature of the In-charge

Signature of the Principal

A.S.D GOVERNMENT DEGREE COLLEGE FOR WOMEN
KAKINADA

DEPARTMENT OF ECONOMICS

స్త్రీ విద్యాప్రవర్తతాం

PROJECT WORK

SUBMITTED BY:

NAME: K. Sandhya Devi
HT.NO: 1711027
GROUP: III BA(HEP)
TOPIC: Cooperative Marketing

TO
Dr.K.YAMUNA

A.S.D. Govt. Degree College for Women (Autonomous), Kakinada

(Accredited by NAAC with "B" in Cycle 3)

(Affiliated to Adikavi Nannayya University)

DEPARTMENT OF ECONOMICS

STUDENT STUDY PROJECT ON

Done by

Under the Guidance of
Dr.K.Yamuna
Lecturer incharge

A.S.D. Govt. Degree College for Women (Autonomous), Kakinada

(Accredited by NAAC with "B" in Cycle 3)

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DEPARTMENT OF ECONOMICS

CERTIFICATE

This is to be certified that the study project

Cooperative Marketing done by K. Sandhya Devi of III B,A. (H.E.P) under the guidance of Dr K.Yamuna,Lecturer in Economics in A.S.D. Government Degree College for Women (A), Kakinada during the year 2019-20. The project carried out by the students is satisfactory.

K. Yamuna
Signature of the faculty

K. Yamuna
Signature of the In-charge

Signature of the Principal

ACKNOWLEDGEMENT

We would like to Express our sincere thanks of gratitude to **Lecturer in Economics** and our **Principal** who gave us the opportunity to do the project on Corporative Marketing and who gave the guidance in doing the study project. This project gave us great experience and we got the opportunity to earn the knowledge.

We would also like to express our sincere thanks to our parents who helped us in completing the project within the limited period.

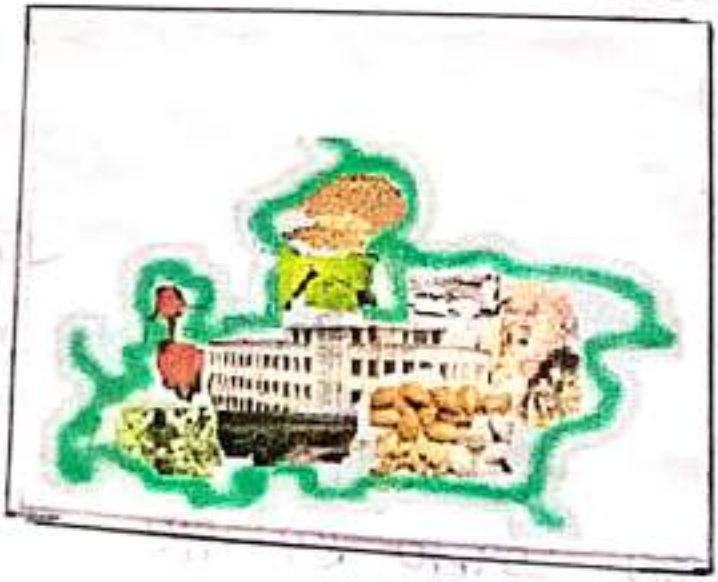
INDEX

సహకార మార్కెటింగ్

క్రమబద్ధమైన మార్కెట్లు, గ్రేడింగ్, ప్రామాణికీకరణ, సరైన తూనికలు, కొలతలు, గిడ్డంగులు, నిల్వ సౌకర్యాలు, మార్కెట్ సమాచారం లభ్యత, ధరల నిర్ణయం, మార్కెటింగ్ పర్యవేక్షణ డెరైక్టరేట్ విశ్వాసం లాంటి ప్రభుత్వ చర్యలు వ్యవసాయ మార్కెటింగ్ వ్యవస్థను మెరుగు పర్చడానికి తోడ్పడుతున్నాయి.

పెద్ద రైతులకు విక్రయించిన తర్వాత మిగులు అధికంగా ఉంటోంది.

ప్రభుత్వ చర్యల కారణంగా వారికి ఎక్కువగా లభ్ది పొందుతున్నారనే వాదన కూడా ఉంది. ఇప్పటికీ గ్రామీణ ప్రాంతాల్లో చిన్న, సన్నకారు రైతులు తమ ఉత్పత్తిలో అధిక భాగాన్ని వివిధ అవసరాల కోసం వ్యాపారులు, కమీషన్ ఏజెంట్లకు విక్రయిస్తున్నారని అనేక అనుభవ పూర్వక కథనాలు తెలియజేస్తున్నాయి.



చిన్న, సన్నకారు రైతులు వారి ఉత్పత్తులకు గిట్టుబాటు ధర పొందే క్రమంలో సహకార మార్కెటింగ్ ప్రాధాన్యం సంతరించుకుంది. రైతులు సహకార ప్రాతి పదికపై మార్కెటింగ్ సంస్థలుగా ఏర్పడి వస్తువులను విక్రయించుకునే విధానమే సహకార మార్కెటింగ్.

భారతలో సహకార మార్కెటింగ్ వ్యవస్థ రెండు రకాలుగా ఉంది.

* మొదటి రకంలో సహకార మార్కెటింగ్ వ్యవస్థ రెండంచెల్లో ఉంది. ఇందులో భాగంగా కింది స్థాయిలో ప్రాథమిక సంస్థలు, అత్యున్నత స్థాయిలో రాష్ట్ర సొసైటీ ఉంటాయి
* రెండో రకంలో సహకార మార్కెటింగ్ వ్యవస్థ మూడంచెలుగా ఉంటుంది. ఈ విధానంలో గ్రామీణ స్థాయిలో ప్రాథమిక సంస్థలు, జిల్లా స్థాయిలో కేంద్ర మార్కెటింగ్ సంస్థలు, రాష్ట్ర స్థాయిలో రాష్ట్ర

సహకార సంఘం ఉంటాయి.

ఆల్- ఇండియా రూరల్ క్రెడిట్ సర్వే కమిటీ సిఫారసుల ఆధారంగా రెండో పంచవర్ష ప్రణాళికలో సహకార మార్కెటింగ్ వ్యవస్థ అభివృద్ధికి చర్యలు ప్రారంభించారు. మిగిలిన మూడో ప్రణాళికలో విస్తరించారు.

ప్రస్తుతం సహకార మార్కెటింగ్ వ్యవస్థలో భాగంగా మండి స్థాయిలో 2633 సాధారణ అవసరాలకు సంబంధించిన ప్రాథమిక సహకార మార్కెటింగ్ సంఘాలు, నూనె గింజలకు సంబంధించి 3290 ప్రత్యేక ప్రాథమిక మార్కెటింగ్ సంఘాలు, 172 జిల్లా లేదా కేంద్ర మార్కెటింగ్ కార్యకలాపాలు నిర్వహిస్తున్నాయి.

జాతీయ స్థాయిలో సహకార మార్కెటింగ్ వ్యవస్థకు శిఖరాగ్ర సంస్థగా 'నేషనల అగ్రికల్చరల్ కో- ఆపరేటివ్ మార్కెటింగ్ -

ఫెడరేషన్ ఆఫ్ ఇండియా లిమిటెడ్ [NAFED] ను ఏర్పాటు చేశారు.

సేకరణ, నిల్వచేసి, ఎంపిక చేసిన వ్యవసాయ వస్తువుల ఎగుమతి, దిగుమతి, కార్యకలాపాలను 'నాఫెడ్' నిర్వహిస్తోంది. ఇది ప్రభుత్వానికి కేంద్ర నోడల్ ఏజెన్సీగా వ్యవహరిస్తూ ఎప్పటికప్పుడు పండని పప్పు ధాన్యాలు, సోనె గింజలు తదితర ఉత్పత్తులకు సంబంధించి మద్దతు ధర కార్యకలాపాలను నిర్వహిస్తోంది. త్వరితంగా కుళ్లిపోయే బంగాళాదుంప, ఉల్లిపాయ, ద్రాక్ష, టొమాటో, గుడ్లు, ఆపిల్స్, మిరప కాయలు, బ్లాక్ పెప్పర్ లాంటి విషయం లని మార్కెట్ జోక్యాన్ని చేయడు తుంది.

సమాకార వ్యవస్థ ద్వారా మార్కెటింగ్ చేస్తున్న వ్యవసాయ ఉత్పత్తుల

[రైతుల ప్రాసెసింగ్]

విలువలను గణనీయమైన మెరుగుదల ...

కాని సహకార మార్కెటింగ్ వ్యవస్థ అభివృద్ధి చెందు దేశాలలో ఇంకా విధంగా లేదు. అనేక దేశాల్లో సహకార మార్కెటింగ్ సంఘాల ఆర్థిక ప్రగతి సంతృప్తికరంగా లేకపోవడం వల్ల ఇవి తీవ్ర నష్టాలను ఎదుర్కొంటున్నాయి.

ఫలాల ప్రాసెసింగ్ :—

ప్రపంచంలో పండ్లు, కూరగాయల ఉత్పత్తుల్లో చైనా తర్వాత భారత స్థానంలో ఉంది.

ప్రపంచంలోని మొత్తం పండ్ల ఉత్పత్తి లో భారత వాటా 10% కాగా, కూరగాయల ఉత్పత్తిలో 13%.

నేషనల్ హార్టికల్చర్ బోర్డ్ గణాంకాల ప్రకారం

[పండ్లు]

2012-13 లలో భారతలలో పండ్లు ఉత్పత్తి 81.285 మిలియన్ మెట్రిక్ టన్నులు, కూరగాయల ఉత్పత్తి 162.19 మిలియన్ మెట్రిక్ టన్నులుగా నమోదైంది.

పండ్ల ఉత్పత్తి విస్తీర్ణం 6.98 మిలియన్ హెక్టార్లు, కూరగాయల ఉత్పత్తి విస్తీర్ణం 9.21 మిలియన్ హెక్టార్లు.

2013-14 లలో పండ్లు, కూరగాయల ఎగుమతుల విలువ రూ॥ 8760.96 కోట్లుకు చేరుకుంది.

దేశంలోని మొత్తం పండ్లు, కూరగాయల ఉత్పత్తిలో 35% వృథా కాకుండా నిల్వ అవస్థాపనా సౌకర్యాలైన శీతల గిడ్డంగులు, గిడ్డంగులు, ఆక్సిజనేటెడ్ ట్రక్కుల కొరత లాంటివి కారణమవుతున్నాయి.

[సహకార సంఘాలు]

సమావేశాలు

దేశంలో ఇటీవల ఆహార ప్రాసెసింగ్ పరిశ్రమ అభివృద్ధి ప్రాధాన్యం పెరిగింది.

భారతదేశంలో సహకార సంఘాల్లో ఏ ఇతర రంగం కూడా రైతులకు చేరువ కాలేదు ఈ నేపథ్యంలో ఆహార ప్రాసెసింగ్ విషయంలో సహకార సంఘాలు దృష్టి సారించడం ద్వారా తమ వ్యాపారాన్ని విస్తరించుకోవచ్చు.

సహకార సంఘాలు గిడ్డంగి వసతి, కోల్డ్ స్టోరేజ్ సౌకర్యాలు, త్వరగా పాడయ్యే వస్తువుల రవాణా కోసం అధునాతన ట్రక్కుల ను సమకూర్చుకోవాలి.

* సహకార సంఘాలు సామాజిక ప్రయోజనం:-

సహకార సంఘాలు సామాజిక ప్రయోజనాలు గూర్చి ఈ క్రింది విధంగాను పేర్కొన్నాబడింది.

* సహకార సంఘాల ఉత్పత్తులకు సంబంధించి కామన్ బ్రాండ్‌లను అభివృద్ధి చేసి వాటిని వినియోగదారులకు చేరువ చేయడం ద్వారా సమాజానికంతటికి ప్రయోజనం కలుగుతుంది.

సహకార సంఘం సభ్యులకు ప్రత్యక్ష మరియు ఉపాధి అవకాశాలు పెరుగుతాయి. తద్వారా వారి ఆదాయస్థాయి పెరుగుతుంది.

ఉదా:—

ప్రాసెసింగ్ చేసిన వ్యవసాయ ఉత్పత్తులకు డిమాండ్ పెరిగితే రియల్ ప్లాంట్లలో సహకార సంఘ సభ్యులకు ప్రత్యక్షంగా, ప్రాసెస్డ్ ఫుడ్ [Processed Food] తయారు చేయడానికి అవసరమైన సరఫరా చేసి రైతులకు మరోక్షంగా ఉపాధి లభిస్తుంది.

[ಚಾಲಿಂಕೆ]

* వినియోగదారుల ప్రయోజనాలను పరిరక్షించడంలో సహకార సంస్థలు తమ వంతు పాత్ర పోషిస్తున్నాయి. మార్కెటింగ్ ధరల స్థిరీకరణకు సహకార సంస్థల ఉత్పత్తులు దోహదపడుతున్నాయి. ప్రైవేట్ డెయిరీలు పాల ప్యాకెట్లు సరఫరా విషయంలో సహకార డెయిరీల నుంచి తీవ్ర పోటీ ఎదుర్కొంటున్నందువల్ల ధరల కొంతమేర నియంత్రణలో ఉంటున్నాయి.

* వ్యవసాయ ఉత్పాదిత సహకార సంస్థలు వాటి ఉత్పత్తుల మార్కెటింగ్ లో విజయవంతమైతే వ్యవసాయ ఉత్పత్తుల పరుగుదలకు అవకాశం ఉంటుంది.

ఫార్మింగ్ కో-ఆపరేటివ్ సర్వీస్ సొసైటీలు ప్రాథమిక వ్యవసాయ

సహకార సంఘాలు, రైతు ప్రొడ్యూసర్ కంపెనీలు, అగ్రి ప్రాసెసింగ్ యూనిట్లు, వ్యవసాయ యంత్రాల తయారీ యూనిట్లు వెలుస్తున్నవి. వ్యవసాయ ఉత్పత్తులు, ఉపాధి పెంపుదలలో ప్రధాన భూమిక పోషిస్తాయి.

* స్వదేశీ మార్కెట్లలో సహకార ఉత్పత్తుల కామన్ బ్రాండ్లు అభివృద్ధి చెందితే రసాయన ఉత్పత్తుల వాడుకలకు అవకాశం రాగి విదేశీ వాణిజ్యం వృద్ధి చెందుతుంది.

భారతదేశపు పెయింట్, టెక్స్‌టైల్స్, తోలు ఉత్పత్తులు, సుగంధ ద్రవ్యాలు, ఇతర ప్రాసెస్ చేసిన వ్యవసాయ ఉత్పత్తులకు ప్రపంచ మార్కెట్లలో డిమాండ్ ఉంది.

ఈ నేపథ్యంలో రెండు ఉత్పత్తులకు సంబంధించి మొదటగా స్వాధీనా డిమాండ్ పెరుగుదలపై సహకార సంఘాలు దృష్టి సారించాలి.

- సహకార సంఘాల అభివృద్ధి ద్వారా పటిష్ఠమైన, విలువ ఆధారిత సమాజం రూపుదిద్దుకుంటుంది. తద్వారా సమాజంలో నిర్లక్ష్యానికి గురైన వర్గాల్లో సాధికారత సాధించవచ్చు.
- ప్రజా పంపిణీ వ్యవస్థ ద్వారా ఆర్థికంగా వెనుకబడిన వర్గాలకు తగిన సేవలు అందించడంలో సహకారా సంఘాలు ప్రధాన పాత్ర పోషిస్తాయి. బియ్యం, గోధుమ, పంచదార, గోధుమ పిండి, కిరోసినను,

[వరి ధాన్యాలు నుండి]
బియ్యము

సబ్సిడీ ధర వద్ద యంత్రాలు చే-
యగలుగుతాయి.

ప్రాథమిక ఉచిత యంత్రాలు అధికమైన చేనేత వస్త్రాల [చీరల యివతిలు] యంత్రాలను సహకార సంఘాల ద్వారా చేపడుతున్నారు.

సహకార మార్కెటింగ్ ప్రయోజనాలు:—

* వ్యవసాయ ఉత్పత్తులకు సంబంధించి అంతిమ కొనుగోలుదార్లతో ప్రత్యక్ష సంబంధాలు విస్తరిస్తాయి.

రైతులకు తమ ఉత్పత్తుల విక్రయంలో బేరమాడే శక్తి వుంటుంది.

సహకార మార్కెటింగ్ సంఘాల నుంచి రైతులు తగినంత మరియి

పొందుగలుగుతారు.

తద్వారా గిట్టుబాటు ధరలు లభించే వరకు రైతులు తమ ఉత్పత్తులను విక్రయించకుండా వేచి ఉండవచ్చు.

ఫలితంగా వారికి లభించే ప్రతి ఫలాల్లో పెరుగుదల ఉంటుంది.

- సహకార మార్కెటింగ్ సంస్థలకు సొంత రవాణా సంస్థానాలు ఉండటం వల్ల రవాణా వ్యయంలో తగ్గుదల విస్పష్టమవుతుంది.
- సహకార సంస్థలు గిడ్డంగి సౌకర్యాలను కల్పిస్తున్నందు వల్ల గిట్టుబాటు ధర లభించే వరకు రైతులు తమ ఉత్పత్తులను నిల్వ చేసుకోవచ్చు.

- శ్రేణికరణ ప్రామాణీకరణ ఉంటుంది.
- మార్కెట్ ధరలు డిమాండ్, సప్లయ్, ఇతర మార్కెట్ సమాచారం వస్తువి కప్పుడు సహకార సంస్థలకు లభిస్తుండటం వల్ల తదనుగుణంగా తగిన ప్రణాళికలను రూపొందించు కోవచ్చు.
- సహకార మార్కెటింగ్ సంస్థలు ఉత్పాదితాలైన వస్త్రాలు, దుస్తులు, క్రిమిసంహారక మందులు, వినియోగ వస్తువులను అధిక పరిమాణంలో తక్కువ ధరలకి కొనుగోలు చేసి సభ్యులకు మధ్య పంపిణీ చేసుకోగలుగుతారు.

* సహకార మార్కెటింగ్ సంస్థలు ప్రాసెసింగ్ కార్యకలాపాలను చేపట్టవచ్చు.

రైతుల్లో ఆత్మవిశ్వాసం, సమిష్టి కృషికి సంబంధించిన అవగాహన వల్ల వ్యవసాయంలో వృద్ధి సాధించవచ్చు.

సమగ్రమైన ప్రణాళికల ద్వారా పంటల తీరులో మార్పు చేపట్టవచ్చు.

వ్యవసాయ ఉత్పత్తులకు సంబంధించి విక్రయం అనే మిగులులో హెచ్చుతగ్గుల ద్వారా ప్రత్యేకీకరణ పరిస్థితులను అధిగమించవచ్చు.

సహకార సంస్థలు చట్టబద్ధంగా గుర్తింపు పొందిన సంస్థలు. వీటికి ప్రభుత్వ మద్దతు ఉంటుంది.

సహకార సంస్థలు:—

కొంతమంది వ్యక్తులు కలసి తమ అందరి బాగోగుల కోసం పనిచేయడాన్ని సహకారం [Cooperation] అంటారు. ఒక్కరు చేయలేని పనిని కొంతమంది కలసి సాధించవచ్చును. ఇలా కొంతమంది కలసి ఉమ్మడి లక్ష్యం కోసం ఉద్యమించడమే సహకారోద్యమం [Cooperative movement]. ఇలా విస్తరించిన సంస్థలను సహకార సంస్థలు [Cooperative Societies] అంటారు.

ఇందులో భాగస్వామ్యమైన వ్యక్తులకు కొన్ని నిర్దిష్టమైన లక్షణాలుంటాయి. సభ్యులు అందరికి సమాన హక్కులు

ఉంటాయి. అందరూ కలసి కార్యక్రమాలు నిర్వహిస్తారు.

సహకార సంఘాలు మొదటి "బెర్మనీ" దేశంలో స్థాపించబడ్డాయి. తర్వాత ప్రపంచ వ్యాప్తంగా చాలా దేశాల్లో సహకారోద్యమం ప్రారంభమైంది.

భారత దేశంలో 1904 సంవత్సరంలో ఈ ఉద్యమం ప్రారంభమైనది. వీటికి సహాయం చేయడానికి ప్రభుత్వంలో సహకార మంత్రిత్వ శాఖలు ఏర్పాటు చేయబడ్డాయి. రాష్ట్ర, జిల్లా తాలుకా స్థాయిలలో సహకార భూమి తనఖా బ్యాంకులు స్థాపించబడ్డాయి. మన రాష్ట్రంలో వివిధ రంగాల్లో సుమారు పన్నెండు వేలకు పైగా సహకార సంఘాలున్నట్లు అంచనా.

వ్యవసాయం మన ప్రజల ముఖ్యమైన వృత్తి. దీనికి కావలసిన పెట్టుబడులు లభించక రైతులు ప్రైవేటు వ్యక్తుల వద్ద అప్పులు తీసుకొని వాటిని సకాలంలో తీర్చలేక తమ స్థిరాస్తులను అమ్ముకోవడం జరుగుతోంది. రైతులే సహకార సంఘాన్ని స్థాపించుకొని, దాని ద్వారా తమకు కావల్సిన నాణ్యమైన ఎరువులు, విత్తనాలు, క్రిమి సంహారక మందులు, ఎరువులు పొందవచ్చును. పండిన పంటలకు కూడా మార్కెటింగ్ సదుపాయం కల్పించుకోవచ్చును.

ఇలాంటి సహకార సంఘాలు ఇతర వృత్తి పనివారు, విద్యార్థులు, ఉద్యోగులు, కార్మికులు కూడా స్థాపించుకొంటున్నారు. దేశాభ్యుదయానికి, ప్రజా సంక్షేమానికి సహకారోద్యమం మూలాధారమైనది.

* కొన్ని సంఘాలు :-

1. గోవిందా పేట ప్రాథమిక వ్యవసాయ సహకార సంఘం, గోవిందా పేట, "నిజామాబాయ్ జిల్లా"
2. గృహలక్ష్మి పరస్పర సహాయక సహకార సంఘం లిమిటెడ్ తేలేరు. "నల్లగొండ జిల్లా"

* వ్యవసాయ మార్కెటింగ్ - ధరల విధానం ఉపోద్ఘాతం :-

వ్యవసాయదారుడు మార్కెట్లకు చేరవేయడానికి, సరియైన ధరలకు విక్రయించుకోవడానికి అవసరమైన సదుపాయాల కల్పనను వ్యవసాయ మార్కెటింగ్ అంటారు. వ్యవసాయ రంగంలో ఉత్పత్తి అయ్యే ఉపయోగాన్యాల ప్రజల అవసరాలకు అనుగుణంగా దేశం అంతటా పంపిణీ కావాలన్నా, వ్యవసాయ - ఆధారిత పరిశ్రమలకు ముడి పదార్థాల

సక్రమంగా అందాలన్నా, సమర్థవంతమైన వ్యవసాయ మార్కెటింగ్ వ్యవస్థ అవసరం. గిట్టుబాటు ధర లభించే వరకు రైతు తన ఉత్పత్తుల-ను నిల్వచేసుకోడానికి, మంచి ధర వచ్చే ప్రాంతానికి వస్తువు తరలించడానికి, సరైన మార్కెటింగ్ సదుపాయాలు కావాలి.

✸ వ్యవసాయ మార్కెటింగ్ - దశలు :—

వ్యవసాయ మార్కెటింగ్ ప్రక్రియలో నాలుగు దశలుంటాయి.

1. అసెంబ్లింగ్ :—

చిన్న చిన్న వ్యవసాయదారులు వ్యక్తిగతంగా అల్ప పరిమాణంలో ఉత్పత్తి చేసిన వస్తువులను సేకరించి పోగుచేసే పద్ధతి అసెంబ్లింగ్. ఇది పెద్ద వ్యాపారుల ద్వారా జరుగుతుంది. వీరు వివిధ ప్రాంతాల నుంచి, చిన్న చిన్నలను వివిధ పరిమాణాలలో కాని ఒక చోట చేర్చి తరువాత

వినియోగదార్లు మార్కెటులకు తరలిస్తారు.

2. ప్రామాణీకరణ :—

వ్యవసాయ ఉత్పత్తులను నాణ్యతను బట్టి వర్గీకరించి, నాణ్యతా ప్రమాణాన్ని నిర్ణయించే విధానాన్ని ప్రామాణీకరణ, గ్రేడింగ్ అంటారు. నాణ్యత గల వస్తువుకు అధిక ధర లభిస్తుంది.

3. ప్రాసెసింగ్ :—

అనేక రకాల వ్యవసాయ ఉత్పత్తులను నేరుగా వినియోగించడానికి వీలుకాదు. వాటిని వినియోగయోగ్యంగా ప్రాసెస్ చేయాలి.

ఉదా:— సూదిగింజలు సూదిగా, ప్రత్తి నూలుగా తయారు చేయడం లాంటి ప్రాసెసింగ్ అంటారు.

4. రవాణా :—

వ్యవసాయదారుడు ఉత్పత్తి చేసిన వస్తువు వినియోగదారుడికి చేరడానికి అనుసరించే

విధానం వంటిలో ఉపయుక్తంది. టోకు వ్యాపారం, చిల్లర వ్యాపారం ఈ వ్యవస్థకి తోడ్పడే కార్యకలాపాలు. ఉత్పత్తి వినియోగాల మధ్య సమతాల్యం సాధించడంలో వంటిలో ప్రధాన పాత్ర వహిస్తుంది.

* భారత దేశంలో మార్కెటింగ్ వ్యవస్థ :—

భారత దేశంలోని సంప్రదాయ వ్యవసాయ మార్కెటింగ్ వ్యవస్థలలో గ్రామ సంతలు ప్రధానపాత్ర వహించాయి. దక్షిణాది రాష్ట్రాలలో వీటిని పాండేలని, ఉత్తరాది రాష్ట్రాలలో హాట్ బజార్ అని పిలుస్తారు. ఇవి ప్రాథమిక మార్కెట్లు. టోకు లేదా అసెంబ్లింగ్ మార్కెట్లను ద్వితీయ మార్కెట్లు అంటారు. అంతిమంగా వస్తువును వినియోగదారుడికి చేరవేసే మార్కెట్లను అంతిమ మార్కెట్లు అంటారు. ప్రముఖ యాత్రాస్థలాల్లో పర్యాటనాల్లో సంతలు నిర్వహించబడతాయి. వ్యవసాయ ఉత్పత్తులకు

- లకు

పశువులను ఈ సంతలలో విక్రయిస్తారు.

→ **క్రమబద్ధ మార్కెట్లు [Regulated Markets]**

మార్కెటింగులో అక్రమ పద్ధతులు అనుసరించకుండా, మోసాలు జరగకుండా రైతులకు సరైన ధరలు లభించవలెనని లక్ష్యంతో క్రమబద్ధమైన మార్కెట్లు ఏర్పాటు చేయడం జరిగింది. దేశంలోని అన్ని రాష్ట్రాలలోను ఈ విధమైన మార్కెట్ల ఏర్పాటు కోసం చట్టాలు చేయడం జరిగింది.

→ **లక్షణాలు :-**

క్రమబద్ధ మార్కెట్లకు కింది లక్షణాలు కలిగి ఉంటాయి.

- ప్రత్యేకంగా ఒక వస్తువు కోసంగాని, అన్ని వస్తువుల సముదాయం కోసంగాని ఈ మార్కెట్లు ఏర్పాటు చేయుటం.
- ఈ మార్కెట్లు చట్టపరంగా ఏర్పాటవుతాయి.

- ప్రతి క్రమబద్ధ మార్కెట నిర్వహణ కోసం ప్రభుత్వం ఒక సంఘాన్ని ఏర్పాటు చేస్తుంది. ఈ సంఘంలో రాష్ట్ర ప్రభుత్వ ప్రతినిధులు, స్వచ్ఛంద సంస్థల ప్రతినిధులు, వ్యవసాయదారులు, కమీషన్ ఏజెంట్లు, వ్యాపారస్తుల ప్రతినిధులు సభ్యులుగా ఉంటారు. వీరు ఒక నిర్ణీత కాలం పదవిలో ఉంటారు.
- వాణిజ్యపరమైన పత్తి, జనుము, పొగాకు అధిక పరిమాణంలో ఉత్పత్తి చేసి గ్రామ హాటల ద్వారా, వారపు సంతల ద్వారా సంప్రదాయ పంటలు విక్రయించే ప్రాంతాలలో వీటిని ప్రధానంగా నెలకొల్పడం జరుగుతుంది.
- లైసెన్సు పొందిన దళారులు, తూనిక దార్లను మాత్రమే ఈ మార్కెట్లలో అనుమతిస్తారు.

→ **లక్ష్యాలు :—**

క్రమ బద్ధ మార్కెట్లు కింది లక్ష్యాలతో పని చేస్తాయి.

- వ్యవసాయ ఉత్పత్తులను గిట్టుబాటు ధర లభించేలా కృషి చేయడం.
- ఉత్పత్తిదారుడు, వినియోగదారుల మధ్య ధరలలో తేడా తగ్గించడం.
- వ్యాపారస్తులు, కమిషన్ ఏజెంట్లకు లభించే [విధులు పరంగాకాని] మార్కెట్లను అదుపు చేయడం

➡ విధులు:-

క్రమబద్ధ మార్కెట్లు కింది విధులు నిర్వహిస్తాయి.

- రైతులు యోసాలు, అక్రమ వ్యాపారులు గుల కాకుండా తమను తాము కాపాడుకోవడానికి, తమ పంటలకు గిట్టుబాటు ధరలు పొందడానికి అనువైన సదుపాయాలను కల్పించడం.
- ప్రామాణిక తూనికలు, కొలతలు వాడకం నిర్ధారణ చేయడం
- తూకం చార్జీలు బ్రోకరేజి లేదా కమిషన్,

చార్జీలను నిర్ణయించడం

- యజమానులకు, తూనికపుదార్లకు లైసెన్సులు ఇవ్వడం
- నిబంధనలకు వ్యతిరేకంగా పనిచేసిన యజమానులను, అక్రమ పద్ధతులకు పాల్పడేవారిని శిక్షించడం
- అనధికారికంగా వస్తు పరిమాణం తగ్గించడం, అక్రమ పద్ధతులకు పాల్పడటం, రహస్య లావాదేవీలు నిర్వహించడం మొదలైన అక్రమ పద్ధతులను అరికట్టడం, అధిక ఆదాయం వస్తుంది. మార్కెట్ కమిటీకి లభించే మార్కెట్ ఫీజు, ఇతర ఆదాయాలను మార్కెట్ కమిటీ నిధి' అంటారు. రాష్ట్రంలోని మార్కెట్ల నిర్వహణకు, అభివృద్ధికి మార్కెట్ కమిటీ నిధి నుంచి ఖర్చుచేయడం జరుగుతుంది. వ్యవసాయ ఉత్పత్తికి సంబంధించిన లేదా రైతు సమాజానికి సంబంధించిన ఏ అను-షంగిక కార్యకలాపాలకు కూడా ఆ నిధి

వినియోగించడం జరుగుతుంది.

- ప్రతి మార్కెట్ కమిటి తన యాల్టిక ఆదాయం లలి 10 శాతం కేంద్ర మార్కెట్ నిధికి చెల్లిస్తుంది. ఈ నిధి నుంచి వివిధ మార్కెట్ కమిటీలకు రుణాలు, గ్రాంట్లు ఇవ్వడం జరుగుతుంది.
- వ్యవసాయ ఉత్పత్తుల క్రయ విక్రయాల సందర్భంగా ఎలాంటి వ్యాపార శుల్కం వసూలు చేయకూడదు.
- ప్రతి మార్కెట్ కమిటికి లైసెన్సు పొందిన వ్యాపారుల ఖాతా పుస్తకాలను పరిశీలించి, స్వాధీనం చేసుకునే అధికారం ఉంది.
- మార్కెట్ చట్టం నియమనిబంధనల వల్ల అతిక్రమించినవారికి రూ. 5000 లు జరిమానా తో పాటు ఆరు నెలల వరకు సంవత్సరంపాటు జైలుశిక్ష విధించే అధికారం ఉంది.
- బహిరంగ వేలం ద్వారాగాని, టెండరు పద్ధతి లోగాని వ్యవసాయ ఉత్పత్తి కొనుగోళ్ళు,

అమ్మకాలు నిర్వహించడం జరుగుతుంది.

- మార్కెట సమాచారం రైతులకు, వ్యాపారస్థులకు తెలియచేయడం జరుగుతుంది

→ వ్యవసాయ మార్కెట కమిటిలు :-

రాష్ట్రంలో 330 మార్కెట కమిటిలు ఉన్నాయి. 906 ప్రకటిత మార్కెట్లు [Notified Markets] పనిచేస్తున్నాయి. మార్కెట కమిటిలలో 11 మంది రైతులు, ముగ్గురు వ్యాపారస్థులు, స్థానిక సంస్థల నుంచి ప్రభుత్వ శాఖ నుంచి నలుగురు ప్రతినిధులు మొత్తం 18 మంది సభ్యులుంటారు. రైతు సభ్యుల నుండి ఒకరు ఛైర్మన్ గా ఉంటారు. అందరిని ప్రభుత్వమే నియమిస్తుంది. ప్రతి మార్కెట కమిటికి ఒక కార్యదర్శి ఉంటాడు. ఆతడే కమిటికి కార్యనిర్వహణాధికారి. 1969 మార్కెట నిబంధనల ప్రకారం మార్కెటకమిటి ఉద్యోగస్థులను మార్కెట కమిటి/ మార్కెటింగ సంచాలకుడు/ ప్రభుత్వం నియమిస్తుంది.

మార్కెట కమిటిలను రాష్ట్రస్థాయి అధికారి మార్కెటింగ్ సంచాలకుడు పర్యవేక్షిస్తాడు. నియంత్రిస్తాడు.

మార్కెట కమిటిలు ప్రకటిత వ్యవసాయ ఉత్పత్తుల ఉమ్మకం, కొనుగోలు పై 1% మార్కెనుగత రుసుము విధించి, వసూలు చేస్తాయి. దిన్ని కొనుగోలుదార్లు చెల్లించాలి. మార్కెట కమిటిలు రైతాయువనరు ఇది ఒక్కటి మాత్రమే ఇది స్థాయింగా కల్పించడం జరుగుతుంది. దీనిని మార్కెట యార్డిక రైతాయుం లని 10 నాతం యొత్తాన్ని కేంద్ర మార్కెట నిధి ఉంచే నిధిలు జమ చేస్తాయి. ఈ నిధి వ్యవసాయ మార్కెటింగ్ సంచాలకుల అధినంలు ఉంటుంది. దీనిని ప్రధానంగా మార్కెట కమిటిలకు రుణాలు ఇవ్వడానికి ఉపయోగిస్తారు. ఈ నిధిని వినియోగించడానికి ఒక ప్రత్యేకమైన రాష్ట్రంగాని, సాధారణమైన రాష్ట్రంగాని ఇచ్చే అధికారం

మార్కెట్ కమిటీకి ఉంది. వ్యవసాయ మార్కెటింగ్ కాని దాని అనుబంధ కార్యకలాపాల అభివృద్ధి కోసం ఖర్చు చేస్తుంది.

మార్కెట్ కమిటీ నిధి పెట్టుబడి

వాణిజ్య బ్యాంకులు జమ చేసి ట్రెజరీ ద్వారా నిర్వహించడం జరుగుతుంది. 2005-06 లో రాష్ట్రంలోని మార్కెట్ కమిటీల ఆదాయం రూ. 202.84 కోట్లు, 1999-2000 నుంచి 2011-12 వరకు మార్కెట్ కమిటీల ఆదాయం పట్టిక 10.1లో చూపడం జరిగింది.

* ఆంధ్ర ప్రదేశ్ మార్కెట్ కమిటీల ఆదాయం

సంవత్సరం	ఆదాయం (రూ. కోట్లలో)
1999 - 2000	163.34
2000 - 2001	207.00
2001 - 2002	168.00
2002 - 2003	202.98
2003 - 2004	196.76

2010 - 2011	472.28
2011 - 2012	248.98

తమ రాబడిలో ఎక్కువ భాగాన్ని మార్కెట్ యార్డుల నిర్మాణానికి, అభివృద్ధికి, రైతులకు వ్యవసాయ రుణ వసతుల కల్పనకు ఉపయోగించడం జరిగింది. వసతుల కల్పనకు మార్కెట్ కమిటీలు వ్యయం చేసిన మొత్తాలు 10.2 పట్టిక లో చూడవచ్చు.

* ఆంధ్రప్రదేశ్ మార్కెట్ కమిటీల వ్యయం

సంవత్సరం	వ్యయం రూ. కోట్లలో
1999 - 2000	57.47
2000 - 2001	51.37
2001 - 2002	40.91
2002 - 2003	34.47
2003 - 2004	133.86
2004 - 2005	81.00
2005 - 2006	285

మార్కెట్ కమిటీలు అమలుపరచే పథకాలు, విధులు

[A]. రైతు బంధు పథకం [pledge Loan Scheme]

తప్పనిసరి పరిస్థితులలో రైతులు తమ ఉత్పత్తులను తక్కువ ధరల వద్ద అమ్మకుని నష్ట పోతూ ఉంటారు ఈ పద్ధతి నుంచి రైతులను కాపాడటానికి మార్కెట్ కమిటీలు రైతు బంధు పథకాన్ని ప్రవేశ పెట్టాయి. రైతుల పంటను తాకట్టు పెట్టుకుని వారికి పరపతి సౌకర్యం కల్పించడం జరుగుతుంది.

ఈ పథకం ముఖ్య లక్షణాలు కింది విధంగా ఉన్నాయి.

* తాకట్టు ఉంచిన ఉత్పత్తుల విలువలో 75 శాతం వరకు రుణం ఇవ్వడం జరుగుతుంది. అయితే గరిష్ట పరిమితి రూ. 50,000/-
* రుణం తీసుకున్న నాటి నుంచి 90 రోజుల వరకు రుణాన్ని వడ్డీవసూలు చేయడం జరగదు.

* 91వ రోజు నుంచి సాధారణ వడ్డీ వసూలు చేయడం ప్రారంభమవుతుంది. రు.5000 రుణం వరకు 6%, రు 5000 నుంచి రు. 15000 వరకు 8%. రు 15000 నుంచి రు. 50000 వరకు 10% వడ్డీ వసూలు చేయడం ప్రారంభమవుతుంది.
* ఈ పథకం కింద రుణాలు మంజూరు చేయడానికి బడ్జెట్ పరిమితులుండవు.
* తాకట్టు ఉంచిన ఉత్పత్తిని మార్కెట్ కమిటి గిడ్డంగులలో నిల్వచేయాలి. ఒకవేళ మార్కెట్ గిడ్డంగులు ఖాళీ లేకపోయినా, మార్కెట్ కమిటీలకు సొంత గిడ్డంగులు లేకపోయినా కేంద్ర గిడ్డంగుల సంస్థ లేదా రాష్ట్ర గిడ్డంగుల సంస్థ గిడ్డంగులలో నిల్వ చేయవచ్చు. అయితే వరవతి మంజూరు చేసిన మార్కెట్ కమిటి అభిప్రాయం లేకుండా ఆ ఉత్పత్తులను గిడ్డంగుల నుంచి వెనుక్కి తీసుకోవడానికి ఆయా సంస్థలు వీలును అనుమతించవని గిడ్డంగి

నిర్వహక సంస్థ వారు ఇవ్వాలి.
మార్కెట కమిటిలు రైతు బంధు పథకం కింద మంజూరు చేసిన రుణాల వివరాలు పట్టిక 10.3 లో చూడవచ్చు.

రైతుబంధు పథకం కింద మంజూరు చేసిన రుణాలు :-

పట్టిక - 10.3

సంవత్సరం	రుణం మొత్తం (రూ. కోట్లలో)	లబ్ధిదారులు
1999 - 2000	14.91	5521
2000 - 2001	17.01	5640
2001 - 2002	35.19	9401
2002 - 2003	73.66	20414
2003 - 2004	54.00	22534
2005 - 2006	38.00	12330
2006 - 2007	31.00	16566
2007 - 2008	12.00	3075
2008 - 2009	23.00	5404
2009 - 2010	08.00	2049

2010-11 లో 3024 మంది రైతులు రుణ సౌకర్యం పొందారు. 2011-12 లో నవంబర్ నాటికి 6443 మంది రైతులు రు. 12.77 కోట్ల వరకు రుణాలు పొందారు. వీరికి, నిర్ణయించిన ధరలకు తమ ఉత్పత్తులను అమ్ముకొనుటకు రైతులకు ఈ రుణాలు ఉపయోగపడతాయి. ఇది ఎంతో ఉపయోగకరమైన పథకం.

[౧౩] ఉత్పాదకాల అమ్మకాలు :-

రైతులకు నాణ్యమైన విత్తనాలు, ఎరువులు, పురుగు మందులను మార్కెట్ యార్డుల లోనే విక్రయించడానికి వాటికి అనుమతి ఇవ్వడం జరిగింది. ఇది రైతులకు ఎంతో సౌకర్యంగా ఉంటుంది. మార్కెట్ కమిటీలు ఏఏ ఉత్పాదకాలను ఎంత మందికి విక్రయించింది, వాటి విలువ పట్టిక 10.4 లో ఇవ్వడం జరిగింది.

పట్టిక 10.4

ముఖ్యమైన కంపెనీల నికరయంత్రాల ఉత్పాదకాల విలువ లబ్ధిదారుల సంఖ్య :-

సంవత్సరం	నికరయంత్రాల ఉత్పాదకాల విలువ	లబ్ధిదారులు
1999 - 2000	33.06	289951
2000 - 2001	17.05	142482
2001 - 2002	14.02	181158
2002 - 2003	16.72	143822
2003 - 2004	22.10	344288

* శీతల గిడ్డంగులు :-

రాష్ట్రంలో శీతల గిడ్డంగుల నిర్మాణానికి ప్రైవేటు ఉత్పాదకులను ప్రోత్సహించడం కోసం మంచి A.P క్యాపిటల్ ఇంటెన్సివ్ సబ్సిడీ స్కీము ఘర కొత్త కొత్త స్టోరేజీస్ అని 20కి రుణం ప్రవేశ పెట్టడం జరిగింది

(ఇ) నాణ్యత - ప్రమాణీకరణ :-

వ్యవసాయ ఉత్పత్తుల నాణ్యతా ప్రమాణాలను నిర్ధారిస్తూ "అగ్మార్క్" సర్టిఫికేట

ఇవ్వబడుతుంది. సాంకేతిక పరిజ్ఞానం ప్రోత్సహించడానికి మార్కెటింగ్ సాధ్య రాష్ట్రాలలో 5 ప్రయోగశాలలు నిర్మాణం చేసింది. ఇవి గుంటూరులోని కేంద్ర పర్యవేక్షణలో పని చేస్తాయి. రాష్ట్రంలోని 5 కింది ప్రదేశాలలో ప్రయోగశాలలు పని చేస్తున్నాయి.

1. గుంటూరు. 2. విజయవాడ 3. సామర్లకోట
4. ప్రొద్దుటూరు. 5. హైదరాబాదు.

ఏ) ఇతర సంస్థలకు సహాయం:—

రైతులకు మార్కెటింగ్ ప్రయోజనం సమకూర్చే విధంగా కార్యక్రమాలు చేపట్టడానికి ఇతర ప్రభుత్వ సంస్థలకు వ్యవసాయ మార్కెటింగ్ సాధ్య నిధులు సమకూరుస్తుంది.

ఐ) శిక్షణ కార్యక్రమాలు:—

వివిధ పంటలు పెరగటం, ఎరువులు, పురుగు మందులు ఏ విధంగా వాడాలి, ధాన్యం సురక్షితంగా ఎలా నిల్వ చేయాలి మొదలైన అంశాల మీద రైతులకు శిక్షణ ఇచ్చే

కార్యక్రమం కూడా మార్కెటింగ్ కమిటీలు నిర్వహిస్తాయి

2) కంప్యూటీకరణ:-

324 మార్కెటింగ్ యార్డులు కంప్యూటీకరించి చారు. వివిధ మార్కెటింగులలో ఇక్కడ యూనిక్ చేర్చిన వస్తువు, ధరలకు సంబంధించిన సమాచారం నెట్‌వర్క్ ద్వారా తెలియచేయడం జరుగుతుంది.

* సహకార మార్కెటింగ్ లక్ష్యాలు:-

వ్యవసాయ మార్కెటింగులో ఉత్పత్తిదారు, వినియోగదారుడికి మధ్య వివిధ దశలలో దళారులు, మధ్యవర్తుల ప్రాబల్యం ఎక్కువ. వారు అధిక వడ్డీలకంటే వసూలు చేసి చాలాకాలం ఎక్కువ ధరలు అధికశాతం వారే పొందుతారు. ఫలితంగా రైతులకు గిట్టుబాటు ధర అందటం లేదు. అందువల్ల రైతులే స్వయంగా సహకార ప్రాతిపదికన సహకార మార్కెటింగ్ సంఘాలు ఏర్పాటు

చేసుకుని తమ వస్తువులను విక్రయించి సరైన ధర పొందడం ద్వారా దళారుల ప్రాబల్యం, రైతుల దోపిడి అరికడుతుంది.

భారతదేశంలోని మొట్టమొదటి సహకార మార్కెటింగ్ సంఘం 1915లో ఏర్పాటైంది. 1954 వరకు సహకార మార్కెటింగ్ సంఘాలు ఒక ప్రత్యేక వ్యవస్థగా పనిచేసినవి. తరువాత నుంచి పరపతి, మార్కెటింగ్ కార్యకలాపాలు రెండింటిని ఒకే సహకార సంఘం నిర్వహించేవిధంగా బహుళార్థ సహకార సంఘాలు పని చేయడం ప్రారంభించాయి. రాష్ట్రంలోని 22 జిల్లా సహకార మార్కెటింగ్ సంఘాలు [DCMS] పని చేస్తున్నాయి.

* అధిక డిమాండు ఉన్న ఉత్పత్తులను వ్యవసాయదారులు చేపట్టడానికి సహాయపడటం
* సభ్యులు తమ ఉత్పత్తులను లాభసాటి ధరల వద్ద విక్రయించుకోవడానికి సహాయపడటం
* పంటలు నష్టానికి గురికాకుండా, వృధా

కాకుండా చూడటం.

* మార్కెటింగులో మధ్యవర్తుల ధరలను తమకు అనుకూలంగా మార్చుకునే పద్ధతులను, అక్రమ వ్యాపార అలవాట్లు.
* సహకార మార్కెటింగ్ సంఘాలు తమ స్వంత రవాణా సాధనాలను ఏర్పాటు చేసుకుని రవాణా ఖర్చు తగ్గించడం, సమయం వృథా కాకుండా చూడటం.
* నాణ్యతను బట్టి వస్తువును వర్గీకరించడం, ప్రామాణీకీకరణ చేయడం, నాణ్యతగల వస్తు ఉత్పత్తిని ప్రోత్సహించడం.
* మార్కెటింగుకి సరఫరా శక్తిని పద్ధతిలో ఉండి విధంగా నియంత్రణ చేస్తూ ధరను ప్రభావితం చేయడం, సరైన ధరను రాబట్టి కోవడం.
* ఎక్కువ మంది మధ్యవర్తులను తొలగించి, ధరలు అధిక మొత్తాన్ని లాభాలు తీసుకుండా తగ్గించడం.

CONCLUSION :-

Marketing Societies play an important role in order to get a better price for the produce, better facilities and Services to the farmers. this in turn will lead to higher income and better lifestyle to the farmers

References :-

* Cooperative Marketing
* Liberary
* www. Internet
* Google Assistant [Wikipedia]

K. Yamu

R. Stanley Raja

External Examiner

A.S.D. Govt. Degree College for Women (Autonomous),Kakinada

(Accredited by NAAC with "B" in Cycle 3)

(Affiliated to AdikaviNannayya University)

DEPARTMENT OF MATHEMATICS

STUDENT STUDY PROJECT ON

NUMBER-THEORY

Done by

III B.Sc.(M.P.C & M.P.Cs), VI Semester

2017-18 Admitted Batch

2019-20

A.S.D. Govt. Degree College for Women (Autonomous),Kakinada

(Accredited by NAAC with "B" in Cycle 3)

(Affiliated to AdikaviNannayya University)

DEPARTMENT OF MATHEMATICS

CERTIFICATE

This is to be certified that the study project on "NUMBER THEORY"done by the team of B.Sc. (M.P.C. and M.P.Cs.) under the guidance of M.Madhavi,Lecturer in Mathematics in A.S.D. Government Degree College for Women (A), Kakinada during the year 2019-20. The project carried out by the students is satisfactory.

M.Madhavi
Signature of the faculty

M.Madhavi
Signature of the In-charge

07/03/2020

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A.S.D. Govt. Degree College for Women (Autonomous),Kakinada

(Accredited by NAAC with "B" in Cycle 3)

(Affiliated to AdikaviNannayya University)

DEPARTMENT OF MATHEMATICS

STUDENT STUDY PROJECT ON

OPERATIONAL RESEARCH

Done by

III B.Sc. VI Semester (MPC & MPCs)

2017–18 Admitted Batch

7th March 2020

A.S.D. Govt. Degree College for Women (Autonomous),Kakinada

(Accredited by NAAC with "B" in Cycle 3)

(Affiliated to AdikaviNannayya University)

DEPARTMENT OF MATHEMATICS

CERTIFICATE

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07/03/2020

M.Madhavi
Signature of the faculty

M.Madhavi
Signature of the In-charge

Signature of the Principal

ACKNOWLEDGEMENT

We would like to Express our sincere thanks of gratitude to M.Madhavi,Lecturer in Mathematics and our Principal who gave us the opportunity to do the project of "OPERSTIONS RESEARCH" and who gave the guidance in doing the study project. This project gave us good experience and we got the opportunity to earn the knowledge.

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A.S.D. Govt. Degree College for Women (Autonomous),Kakinada

(Accredited by NAAC with "B" in Cycle 3)

(Affiliated to AdikaviNannayya University)

DEPARTMENT OF MATHEMATICS

STUDENT STUDY PROJECT ON

Laplace Transformations

Done by

III B.Sc., VI Semester

2017-18 Admitted Batch

A.S.D. Govt. Degree College for Women (Autonomous),Kakinada

(Accredited by NAAC with "B" in Cycle 3)

(Affiliated to AdikaviNannayya University)

DEPARTMENT OF MATHEMATICS

CERTIFICATE

This is to be certified that the study project on "LAPLACE TRANSFORMATIONS"done by the team of B.Sc. (M.P.C. and M.P.Cs.) under the guidance of M.Madhavi, Lecturer in Mathematics in A.S.D. Government Degree College for Women (A), Kakinada during the year 2019-20. The project carried out by the students is satisfactory.

07/03/2020

M. Madhavi
Signature of the faculty

M. Madhavi
Signature of the In-charge

Signature of the External

ACKNOWLEDGEMENT

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A.S.D. Govt. Degree College for Women (Autonomous), Kakinada

(Accredited by NAAC with "B" in Cycle 3)

(Affiliated to Adikavi Nannayya University)

DEPARTMENT OF MATHEMATICS

STUDENT STUDY PROJECT ON

MATHEMATICS IN NATURE

Done by

III B.Sc(MPCS) & MPC ; VI Semester,

2017-18 Admitted Batch

2019 — 20

A.S.D. Govt. Degree College for Women (Autonomous), Kakinada

(Accredited by NAAC with "B" in Cycle 3)

(Affiliated to Adikavi Nannayya University)

DEPARTMENT OF MATHEMATICS

CERTIFICATE

This is to be certified that the study project on "MATHEMATICS IN NATURE" done by the team of B.Sc. (M.P.Cs.) under the guidance of M.Madhavi, Lecturer in Mathematics in A.S.D. Government Degree College for Women (A), Kakinada during the year 2019-20. The project carried out by the students is satisfactory.

M.Madhavi
Signature of the faculty

M.Madhavi
Signature of the In-charge
Lecturer in Maths

07/03/2020

ACKNOWLEDGEMENT

We would like to Express our sincere thanks of gratitude to M.Madhavi,Lecturer in Mathematics and our Principal who gave us the opportunity to do the project of "MATHEMATICS IN NATURE" and who gave the guidance in doing the study project. This project gave us good experience and we got the opportunity to earn the knowledge.

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A.S.D. Govt. Degree College for Women (Autonomous),Kakinada

(Accredited by NAAC with "B" in Cycle 3)

(Affiliated to AdikaviNannayya University)

DEPARTMENT OF MATHEMATICS

STUDENT STUDY PROJECT ON

DIFFERENTIAL EQUATIONS

Done by

IIIB.Sc(MPCS&MPC); VI Semester.

2017-18 Admitted Batch

7th March 2020

A.S.D. Govt. Degree College for Women (Autonomous),Kakinada

(Accredited by NAAC with "B" in Cycle 3)

(Affiliated to AdikaviNannayya University)

DEPARTMENT OF MATHEMATICS

CERTIFICATE

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M.Madhavi
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M.Madhavi
Signature of the In-charge
Lecturer in Maths.

07/03/2020

ACKNOWLEDGEMENT

We would like to Express our sincere thanks of gratitude to M.Madhavi,Lecturer in Mathematics and our Principal who gave us the opportunity to do the project of "DIFFERENTIAL EQUATIONS and who gave the guidance in doing the study project. This project gave us good experience and we got the opportunity to earn the knowledge.

We would also like to express our sincere thanks to our parents who helped us in completing the project within the limited period.

A.S.D. Govt. Degree College for Women (Autonomous),Kakinada

(Accredited by NAAC with "B" in Cycle 3)

(Affiliated to AdikaviNannayya University)

DEPARTMENT OF MATHEMATICS

STUDENT STUDY PROJECT ON

C PROGRAMMING ON NUMERICAL METHODS

Done by

IIIB.Sc(MPCS) VI Semester

2017-18 Admitted batch.

2019 – 20

A.S.D. Govt. Degree College for Women (Autonomous),Kakinada

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DEPARTMENT OF MATHEMATICS

CERTIFICATE

This is to be certified that the study project on "C PROGRAMMING ON NUMERICAL METHODS done by the team of (B.Sc M.P.Cs.) under the guidance of M.Madhavi,Lecturer in Mathematics in A.S.D. Government Degree College for Women (A), Kakinada during the year 2019-20. The project carried out by the students is satisfactory.

M.Madhavi
Signature of the faculty

M.Madhavi
Signature of the In-charge

Por. Principal 03/03/2020

ACKNOWLEDGEMENT:

We would like to express our sincere thanks of gratitude to M. Madhavi, Lecturer in mathematics and our principal who gave us the opportunity to do the project of "C PROGRAMMING ON NUMERICAL METHODS" and who gave the guidance in doing the study project. This project gave us good Experience and we got the opportunity to earn the knowledge.

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