# YLECTRAZE

## SPECTRUM 2023

**VOLUME 2**

# ECE
# SPECTRUM

INSPIRE * INNOVATE * INTERACT

# DEPARTMENT ASSOCIATION OF
# ELECTRONICS AND COMMUNICATION

# SPECTRUM ASSOCIATION



## THE FOLLOWING MEMBERS HAVE BEEN NOMINATED FOR THE ACADEMIC YEAR

## 2022-2023

PRIYANK SIDDARTH. M J ( PRESIDENT )                 -IV ECE A

SANDHIYA.S ( VICE PRESIDENT )                       -IV ECE B

NAVEEN CHANDRA.V ( SECRETARY )                      -III ECE B

SURESHKUMAR.M ( JOINT SECRETARY )                   -III ECE A

HARISUTHA.A S ( TREASURER )                         -III ECE B

SRIVISHNU.R ( MAGAZINE EDITOR )                     -III ECEA

KEERTHIKA.M ( REPORT EDITOR )                       -III ECE B

KRISHA. S ( EXECUTIVE MEMBER )                      -IV ECE A

SURENDRAKUMAR. B ( EXECUTIVE MEMBER )               -IV ECE A

DIVYA.B ( EXECUTIVE MEMBER )                        -III ECE B

# OFFICE BEARERS:

| | |
|---|---|
| PRAVEEN.V | -IV ECE A |
| PRANOOVE.K | -IV ECE A |
| HARINI.M | -III ECE B |
| SUBAASH.S | -III ECE A |
| RAM PRASHANTH.R V | - II ECE B |
| PREETH.R K | - II ECE A |
| KARTHIK.T | - II ECE B |
| SANDHYA.P | - II ECE B |
| KONEESHWARAN.N | - II ECE A |
| PRIYADHARSHINI.M | - II ECE A |
| ETHEGASWARAN.T | - II ECE A |
| MONISHA.S | - II ECE A |
| JAI AKKAYARAJKUMAR.V J | - II ECE A |
| AATHITAYAH.U R | - II ECE B |
| SELVAPRIYA.P | - II ECE A |
| SRINESH.K | - II ECE A |
| HEMALATHA.A E | - II ECE B |
| POOJAA.T G | - II ECE A |
| KAVIYA DHARSINI.S | - II ECE A |
| DINESH KUMAR.M | - II ECE A |
| PRIYA DHARSHINI.T | - II ECE A |
| MUGESH.G | - II ECE A |
| MONIKA.T | - II ECE B |
| HIRUTHIKA.M J | - II ECE B |
| PRADEEPA.S | - II ECE B |

# THE FOREMAN

As the President of the Spectrum Association for the academic year 2022-2023, I am thrilled to lead this esteemed association with a fresh perspective. I am fortunate to have a dedicated and enthusiastic team by my side, who share my vision for promoting the professional development of our ECE students.

In addition to continuing the successful efforts of the previous years, I took the initiative to break the conventional followings and bring in some changes to the association. We refreshed our logo to reflect who we are today and to symbolize our future. This step has helped us to establish a unique identity and connect better with our members.

Furthermore, I introduced the formal coat suit for the four pillars - President, Vice President, Secretary, Joint Secretary, and identity badges for the office bearers. This move has brought more uniformity and professionalism to our association, and it has been well-received by our members.

Lastly, I am proud to have gotten approval to wear T-shirts during events for my dear Spectrum members. This small but significant change has made our members feel more comfortable and connected during events.

*As we move forward, I urge my team to continue their efforts in providing our students with the best possible opportunities for their overall development. I strongly believe that our upcoming events will offer our students the chance to engage with industry experts, learn new skills, and network with their peers.*

*In conclusion, it is an honor to lead the Spectrum Association, and I will continue to guide them towards becoming a strong community of future professionals in the field of Electronics and Communication Engineering.*

*- **PRIYANK SIDDARTH M J***
*   **IV ECE A***

# THE VICE – PRESIDENT

As the Vice president of the Spectrum Association for the academic year 2022-2023, I am extremely honored and privileged for being a big supporting pillar for my Association and my spectrum members. From being an office Bearer to Vice president I had gained lot many moments, experiences and the skills of Enhancement and Leadership.

I wish and pray that my fellow mates would follow the foot steps which we gave and am proud to have led such a talented and innovative team. As a responsible vice president I have made my immense contribution in conducting the events and I hope so I have fulfilled the need to my level Best . In spite of being the Leader, more of I have been humble, dedicated, kind, polite, and also a friendly senior with my beloved juniors. It's an incredible work experience to work with the spectrum association for 3 years and I'm grateful to cherish all the moments in my life forever.

A big thanks to my dedicated Mentor ,president, secretary, joint secretary, and treasurer for their enormous amount of efforts that they invested for the upliftment of the spectrum

*association during this year. I am very much glad that 3 pillars of the association will make a remarkable change in the journey of service.*

*With the almighty, I heartily congratulate the entire spectrum team for their great future. In conclusion, it is an honor to lead the Spectrum Association, and I will continue to guide them both professionally and personally towards becoming a strong community of future professionals in the field of Electronics and Communication Engineering.*

*SANDHIYA S*
*IV ECE B*

# C-DHAMAKA

Mahalingam College of Engineering and Technology (MCET) organized a coding contest named "C DHAMAKA" to show up their skills for placement. The contest was conducted on March 31, 2023, from 9:00 am to 1:00 pm, and saw participation from 106 students of the II, III & IV-year ECE department.

The objective of the event was to provide an opportunity for the students to enhance their coding skills ,debugging and problem solving skills.

The contest was held in two rounds. The first round was a quiz with 25 questions, and the top scores were selected for the next round.

The second round consists of basic problems on C language and problem-solving through C. Out of the 106 participants, 38 were selected for this round, and the top 5 performers were selected as the winners. The winners were selected by a jury member, D. Janani, who is an Assistant Professor/ IT. The event "C DHAMAKA" received a tremendous response from the students, and they actively participated in both rounds of the contest. The quiz was designed to test their knowledge of C language, and the questions were formulated in such a way that they not only tested their knowledge but also their critical thinking and problem-solving skills.

It was an another successful event where the winners were awarded with exciting cash prizes . The students were thrilled with this opportunity and appreciated the efforts of MCET in organizing such events to support their C Dhamaka Hackathon likely focused on the C language, challenging participants to solve coding problems using this language

**"C Dhamaka Hackathon, a coding competition held by the Spectrum Association, challenged participants to solve coding problems using the C language in a competitive environment."**

professional development.

C Dhamaka Hackathon likely focused on the C language, challenging participants to solve coding problems using this language. Participants exhibits their coding skills and problem-solving abilities within a competitive and high-pressure environment, with the goal of coming out on top as the winner of the competition. Overall, C Dhamaka Hackathon sounds like a challenging and exciting event for programmers who enjoy testing their skills and competing against others. It provided the participants with a valuable learning experience .

# ALUMNI INTERACTION

The Department Association for Electronics and Communication Engineering (ECE) at Mahalingam College of Engineering and Technology (MCET) regularly organizes sessions to help students with their career development. Recently, an online session was conducted for second-year students, featuring an alumni guest speaker, Ms. S. Haritha from the 2013-17 batch.

Ms. Haritha started her career as a software engineer at Tech Mahindra and is currently working at Salesforce Marketing Cloud. During the session, she interacted with the students and provided valuable career guidance. Many students raised doubts about their career prospects and placements, which were cleared by Ms. Haritha.
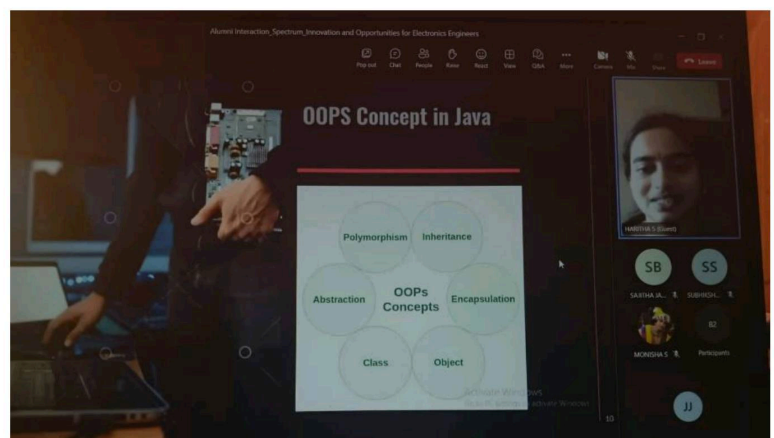
The session was coordinated by Mr. Shafeek Ali, the Association Coordinator for ECE. Ms. Haritha also gave an introduction to the core and IT works, providing students with a better understanding of the industry. The session was a great success, providing students with valuable insights into the industry and helping them make informed career choices.

The Department Association for ECE at MCET is committed to providing students with opportunities to supplement their academic learning with practical skills and knowledge. Sessions like these are an essential part of the department's efforts to ensure that students are prepared for the real world and achieve their professional goals. The Association also fosters a sense of community and engagement among students, promoting teamwork and leadership skills.
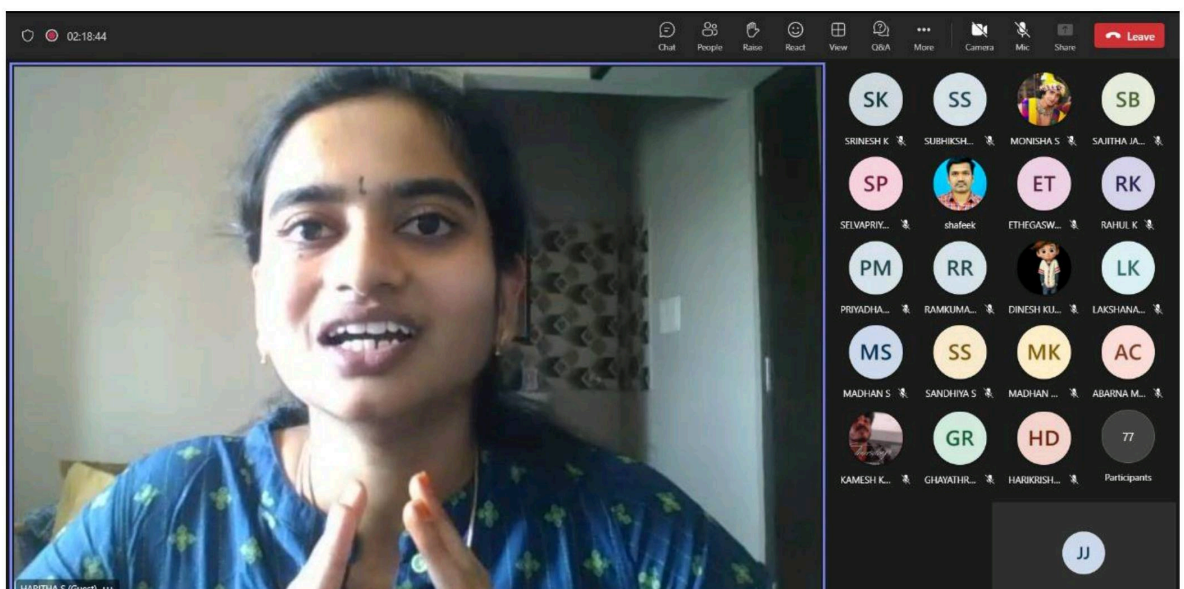
# CHROMA
## NEWSLETTER RELEASE

Spectrum association recently had the privilege of having Mr. Karthi from New Technology, who interacted with the students and provided insights into the functioning of a multimeter and mobile phone services. The event was a great opportunity for the students to gain practical knowledge from an industry expert. During the session, Mr. Karthi explained the working of a multimeter and mobile phone services. The students were able to ask questions and clarify their doubts with Mr. Karthi, making the session interactive and informative.

Our department association had the privilege to have Mr. Krishnakumar, Founder of New Technology, Coimbatore, as the chief guest for the event. Mr. Krishnakumar released the college's newsletter and interacted with the students, providing them with valuable insights into the industry and its trends.

provided students with an introduction to mobile In addition to the interactions with industry experts, MCET also distributed the BEC examination certificates to the second-year students during the event. Mrs. Thilagavathi (AP/ECE) and Mrs. Vanjipriya.P (AP/ECE) handed out the certificates to the students, making the event a memorable one for the students.

The interaction with industry experts provided the students with an opportunity to learn from experienced professionals and gain practical knowledge that will be valuable for their future careers. Department association, Spectrum continues to organize such events to promote the professional development of its students and provide them with a platform to interact with experts from various industries.

# MAGAZINE RELEASE

The first-year students of the Electronics and Communication Engineering (ECE) department at Mahalingam College of Engineering and Technology (MCET) were in for a treat recently as they participated in the release of the latest issue of the department's magazine, YLECTRAZE 10.1.

The event was graced by the presence of the Head of Department (HOD), Dr. R. Sudhakar, and the Association Coordinator, Mr. A. Shafeek The event began with an interactive session between the HOD and the first-year students, during which Mr. Sudhakar provided valuable insights into the department's vision and goals.

Mr. A. Shafeek then discussed the upcoming events and opportunities for the students to participate in various technical and non-technical activities.

The highlight of the event was the release of YLECTRAZE 10.1, the latest edition of the department's magazine. The HOD and the Association Coordinator jointly released the magazine, which

showcased the achievements and activities of the department's students and faculty. The magazine included articles, research papers, and other contributions from the department's members, making it a comprehensive and informative read. The department's faculty members, including Mr. Gurunathan, were also present at the event, showing their support for the department's students and their initiatives. The members of the department's association conducted technical and non-technical events for the first-year students, providing them with a platform to showcase their skills and talents.

Overall, the magazine release event was a grand success, providing the students with an opportunity to showcase their achievements and learn from experienced professionals in the department. The event was a testimony to the department's commitment to promoting the holistic development of its students and providing them with a platform to excel in their chosen field of study.
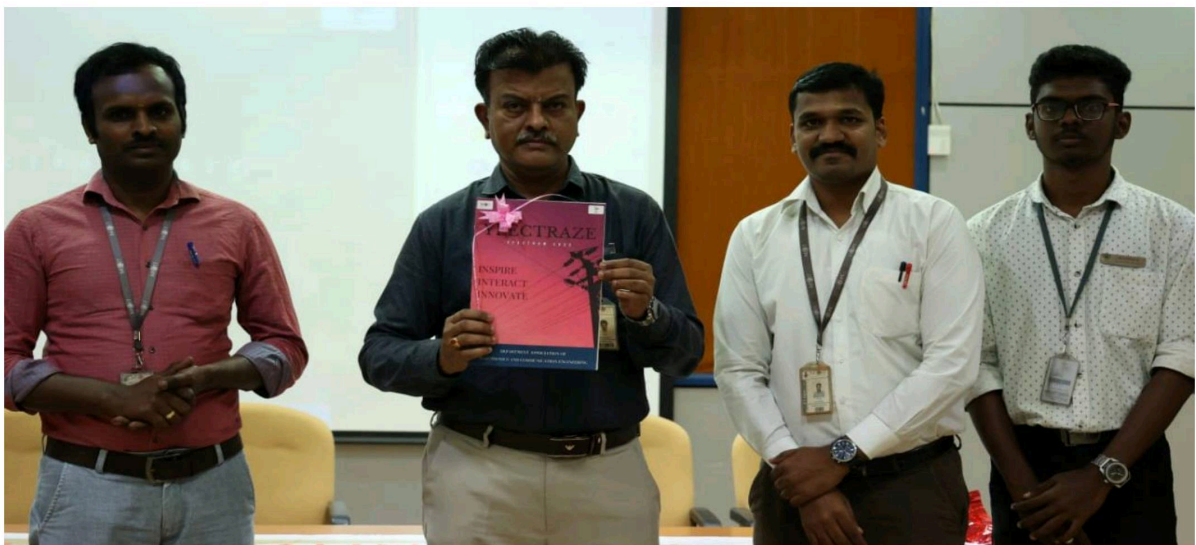
# TECH TIMES

## EEG cap using dry electrodes

An EEG cap with dry electrodes is a device used to measure electrical activity in the brain without the need for conductive gel or paste.

Dry electrodes use a different mechanism than traditional wet electrodes to pick up the electrical signals generated by the brain.

In dry electrode systems, the electrodes are coated with a conductive material such as silver/silver chloride or carbon nanotubes that allows for direct contact with the skin. The conductive material is designed to make good contact with the skin, allowing the electrode to pick up electrical signals. The benefits of using dry electrode EEG caps include:

Convenience: Dry electrode EEG caps can be easily put on and taken off without the need for conductive gel or paste, making them more convenient and less messy than traditional wet electrode systems.

Comfort: Dry electrode EEG caps are typically more comfortable to wear than traditional wet electrode systems as they do not require conductive gel or paste to be applied to the scalp.

Faster setup time: Because there is no need to apply conductive gel or paste, the setup time for a dry electrode EEG cap is typically faster than traditional wet electrode systems.

However, there are also some limitations to using dry electrode EEG caps. One major limitation is that the signals picked up by dry electrodes are often weaker than those picked up by traditional wet electrodes, which can lead to lower signal quality.

Additionally, the performance of dry electrode EEG caps can be affected by factors such as sweat, hair, and skin impedance.

- **KARTHIK T**

**II ECE B**

# ANALOG COMPUTERS

Analog computers are all classes of devices in which continuously different physical values such as electrical potential, fluid pressure or mechanical motion are represented at a similar cost corresponding to the problem to be solved. The simulated machine is set for the first time, which can be changed freely.



Obtain answers to questions by evaluating variables in simulation models.

The **first** computers were **specialized** machines, **such** as the **waterproof machine built** by William Thomson **in 1873**

**Components are** added by **the bow** to a **composition.**

Analog computers can **be** of **many different types. Calculators** and nomograms are the simplest, while **combat h elicopter** control computers and digital analog computers **are** the most **complex.**

Another **important factor** in the development of modern analog **computer** was the **creation** of the **difference** analyzer **by the American electrical engineer Vannevar Bush and his colleagues** in the early **1930s.**This **machine uses a combination machine(different gears)** to solve **the** differential **equation and is** the first practical and reliable device of its kind.
They **are** widely used in **the simulation** of aircraft, nuclear power **plants** and chemical processes. Other **important applications are in** hydraulic networks **(e.g. water flow from sewers) and electrical equipment** (e.g., **long circuit operation).**

Complex **systems of** control and **protection** rel ays **use** analog **calculati ons** to perform control an d **protection** functions.

**Even after the advent of digital computers, anal og** computers **are** widely used in scientific and indu strial **applications, as** th ey **are often very fast ov er time,** but **are still use d today, although** they **b egan** to **be phased out** a s early as the 1950s and **1960s.** some **situations. applications** such as
**Limitations :**
In general, analog computers are limited **to adverse** effects. **Analog signals consist** of four basic components: **dc** and **ac magnitude, frequency** and phase.

Airplane flight simulators, flight **computers on airplanes** and **university administration.** Perhaps the most **notable** example of analog **computer is a watchdog, in which** the **constant rotation** and **timing** of **the link** drives the **seconds,** minute and hour **hands on** the clock. More **advanced** applications, such as aircraft flight simulators and **synthetic aperture** radar, **were still** the **responsibility** of analog computing (and hybrid computing) **in** the **1980s because** digital computers **weren't enough** for the job.
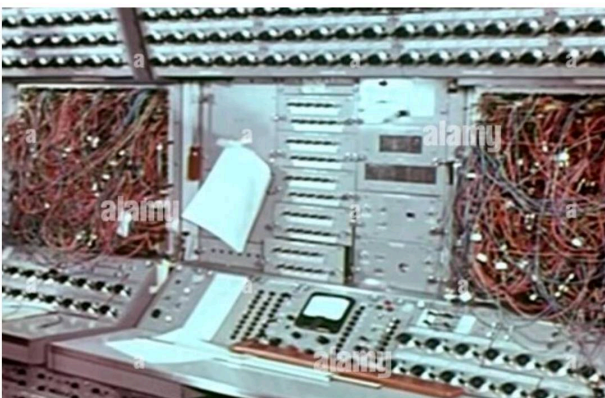


**Limited use of these features** limits analog computers. Some of these **limitations** include **op amp** offset, finite **gain** and frequency response, noise floor, **nonlinearity,** temperature coefficient, and **noises in the** semiconductor **device. The amount** of input and **electronic products is** always **beneficial for the electronics business.** The Simulation **Committee's newsletter** from 1952 to 1963 **is** available **online, showing** the concerns and **technology of** the **time** and the use of **computer simulation in missiles.**

PRADEEPA S

II ECE B

# *RFID*
## *TECHNOLOGY*
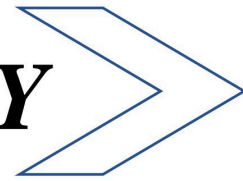
RFID **technology is widely used in clothing, automobile, medicine, etc, gained** importance **in companies.** RFID, it basically uses **electronic devices to identify and track items with** all tags **attached.** Companies **contributed** a lot **to this technology, and** it is growing rapidly once customer knows how to deploy it.

**RFID can solve real world** business problems. **With** its low cost, automatic identification and **widespread use, RFID has become the cutting-** edge technology for ubiquitous computing, IoT, intelligent transportation and IoT.

The New RFID technology securely shares and analyses real time data In a game changing concept, IBM has develop a new **radio analytics tool that allows** customers to share and analyse **real-time** data generated by sensors. The technology is **called** WebSphere **RFID** Information **Centre.**

**The** RFID Information **Center** receives data from RFID middleware, which **collects, filters,** and interprets data directly from the **reader.**
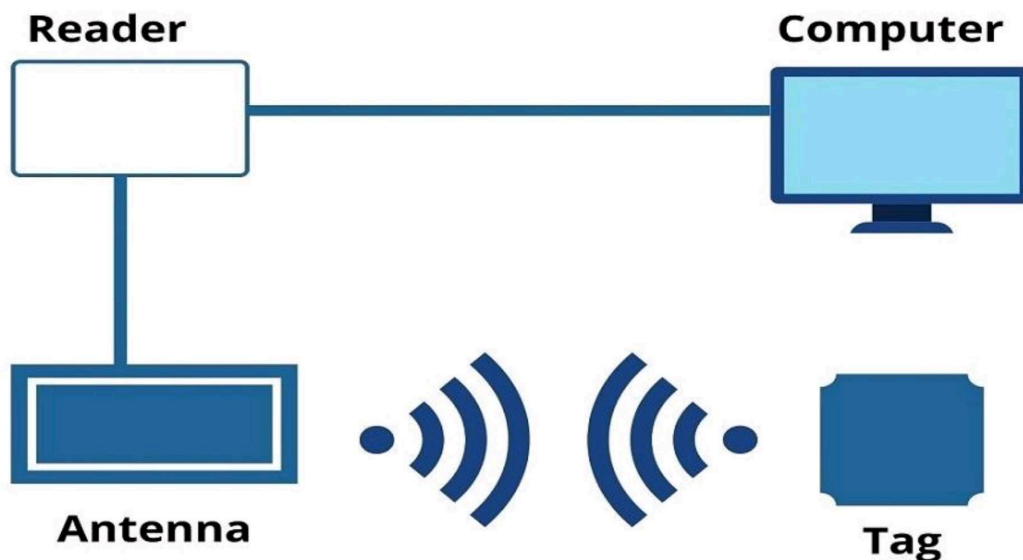
**The** RFID **data centre then stores and** manages all or **some** of the data **and distributes the data** across the **enterprise, including** with **business partners, with a variety of business applications.**

WebSphere will also provide **a** data platform **for other** business **applications** such as **mobility,** inventory management, **recovery plans and** compliance.

**Delhi Toll Plazas to get benefits from RFID**

**By the end of October, RFID will be available at tolls** Delhi and 65 lanes **across** the **border.** South Delhi Municipal Corporation **while waiting for the public works** to be completed by September **13.**

**At 13 entry points where 85 % of vehicles enter Delhi,** fastag will be used **and** SDMC is **happy with it** the introduction of this new **tax.**

Reader or Interrogator

Antenna

Tag or Transponder

Computer
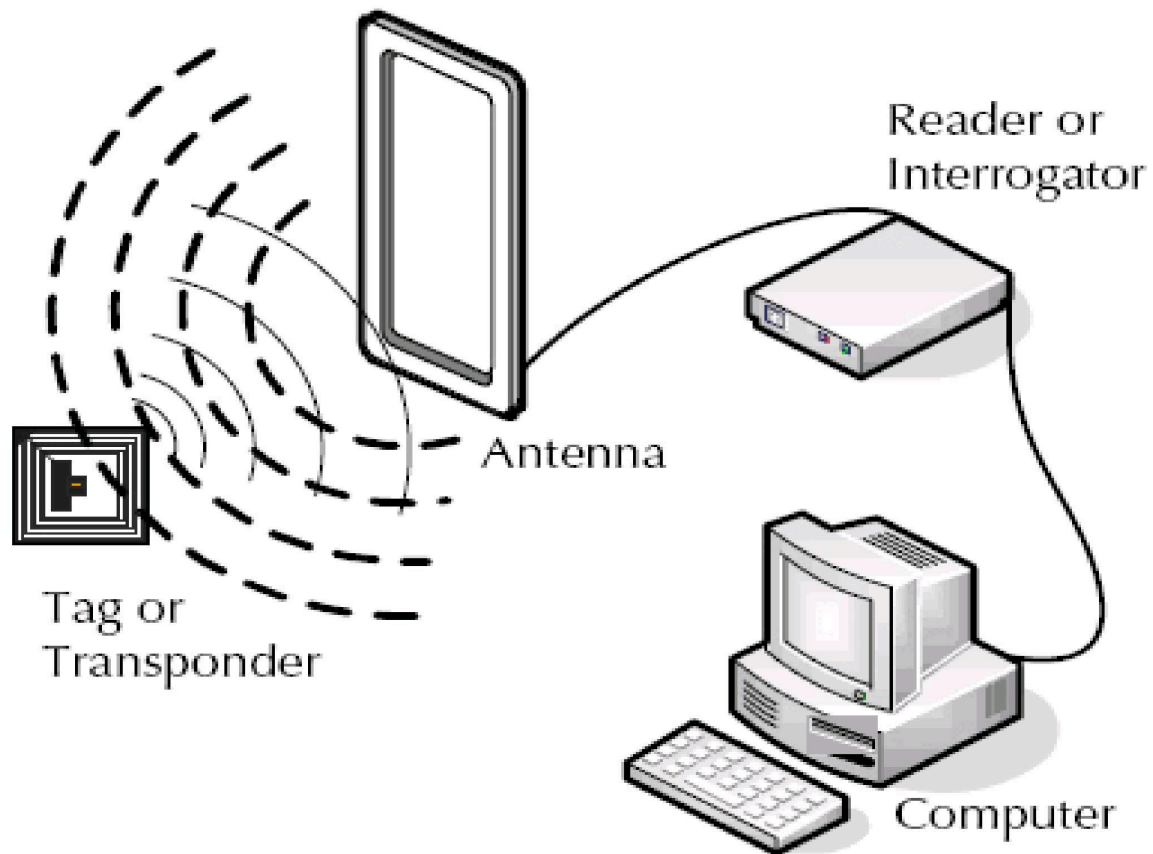
**Future of the RFID Technology :**

Visions and Challenges With the widespread use of RFID technology, a number of challenges arise that are important and must be overcome in order to take advantage of RFID technology. These new challenges Include energy data collection and large        -
area operations, IoT        -

**enabled** software **infra structure,** and security and **privacy** attacks. The RFID **industry** is a bout to enter a    **critical** and **critical period,** as **greater**    adoption will **allow vendors to use** technology to **lead change.**

**SANDHYA P**
**II ECE B**
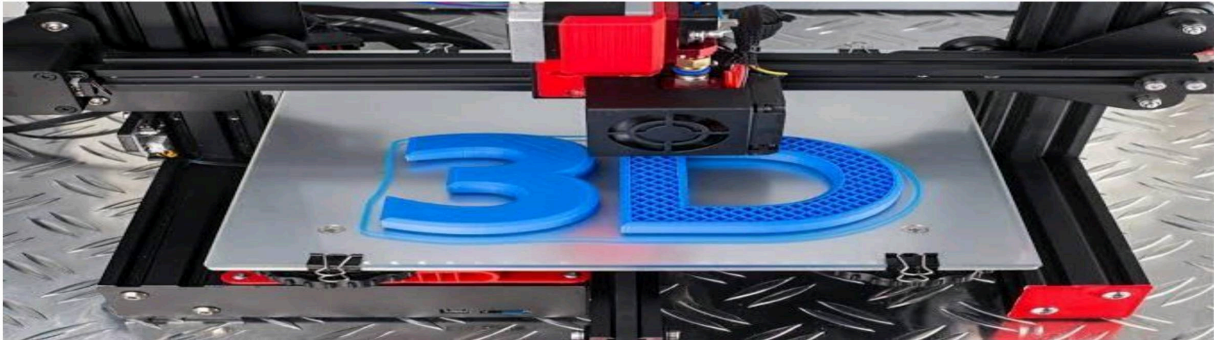
# 3D printing revolutionizes manufacturing

3D printing, also known as additive manufacturing, is a process of creating threedimensional objects from a digital file. This technology has revolutionized the manufacturing industry and has many applications in fields ranging from healthcare to aerospace.

The process of 3D printing involves creating a digital model of the object to be printed using Computer-Aided Design (CAD) software. The digital model is then sliced into thin layers, and the 3D printer creates the object by adding material layer by layer until the final product is complete.

There are several different types of 3D printers, each with its unique advantages and disadvantages. Some of the most commonly used 3D printing technologies include Fused Deposition Modeling (FDM), Stereo lithography (SLA), and Selective Laser Sintering (SLS).

FDM is the most common type of 3D printing technology and is widely used in hobbyist and consumer applications. FDM printers use a spool of thermoplastic filament that is melted and extruded through a nozzle to create the object layer by layer.

SLA is a more precise and detailed 3D printing technology that uses a liquid resin that is cured by a laser to create the object. SLS is another high-end 3D printing technology that uses a laser to sinter powder into solid objects.

3D printing has many applications, including prototyping, manufacturing, and medical applications. In the manufacturing industry, 3D printing has revolutionized the way companies design and produce products. Companies can use 3D printing to create prototypes quickly and efficiently, allowing them to test their products before going into production.

In the medical field, 3D printing has been used to create custom prosthetics, dental implants, and even organs. Researchers have been able to 3D print liver tissue, heart valves, and other organs, which could eventually lead to the ability to create functional organs for transplantation.

One of the most significant advantages of 3D printing is its ability to create complex geometries and intricate designs that would be impossible to manufacture using traditional manufacturing methods. 3D printing can also reduce waste and lead times, making it a more sustainable and cost-effective manufacturing method.

Despite its many benefits, 3D printing still faces some challenges. The cost of 3D printing technology can be prohibitive for small businesses and individuals. Additionally, the quality and strength of 3D printed parts may not be as high as those manufactured using traditional methods.

In conclusion, 3D printing is a rapidly evolving technology with many applications in various industries. While it still faces some challenges, it has the potential to revolutionize manufacturing, medicine, and other fields in the years to come.

ETHEGASWARAN T
II YEAR ECE A

When a constant current is applied to a LED light, tiny packets of energy called photons are released which we see as visible light. Since LEDs are semiconductor devices, the current and optical output can be modulated at very high speeds. This is then detected by a photodetector device that converts it back to electric current. This is how LiFi technology uses LED to transmit data. Our existing wireless technologies using radio waves has many limitations due to frequency, bandwidth and it is highly vulnerable to security. Compared radio waves used in conventional wireless systems, visible light has thousand times higher bandwidth. Unlimited bandwidth makes it one of the most efficient solutions for data-intensive applications.

In digital transmission system, data will be converted in to binary bits in the form of zeros and ones equivalent to on and 'off' states. Visible light is an ultra fast electromagnetic wave with unlimited bandwidth to utilize. High speed switching of light can't be detected by human eyes but highly sensitive photodiodes can efficiently detect the modulation of light interact with the detectors.

## Advantages

Li-Fi technology is fast, full duplex and bidirectional communication system capable of data rate up to 224 gigabits per second.

A 2017 study by the University of Eindhoven obtained a download rate of 42.8 Gbit/s with infrared light with a radius of 2.5 metres , when the best wi-fi would barely reach 300 Mbit/s.

It is up to 10 times cheaper than wi-fi, requires fewer components and uses less energy. All you have to do is turn on a light!

Any light fitting can easily be converted into an internet connection point, as only a simple LiFi emitter needs to be fitted.

Light does not pass through walls like radio waves do, and this prevents intruders from intercepting LiFi communications through a wireless network.so it provides high security. LiFi transmits its signal without interruptions, making communication more stable than with wi-fi. the light spectrum is 10,000 times wider than the radio spectrum, which increases the volume of data it can carry and transmit per second. internet connection via light could prevent the collapse of the radio spectrum.

## Disadvantages :

In open spaces, Wi-Fi' s coverage can go up to 32 meters but LiFi can only go up to 10 meters.
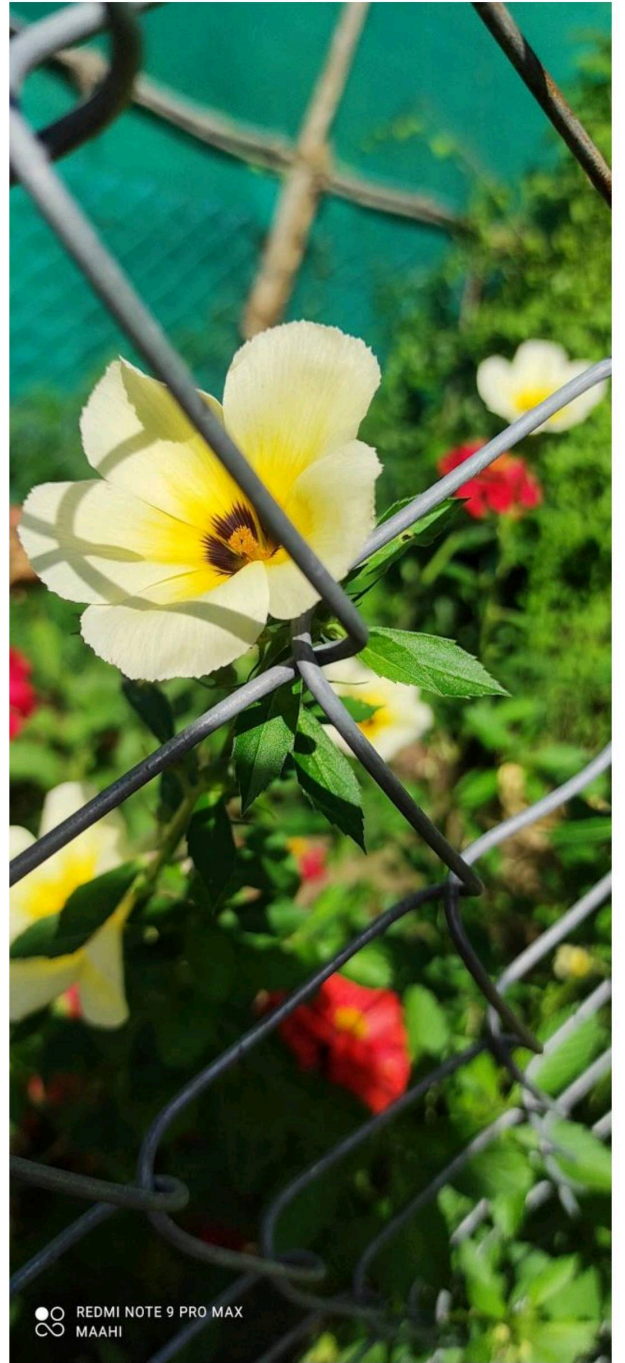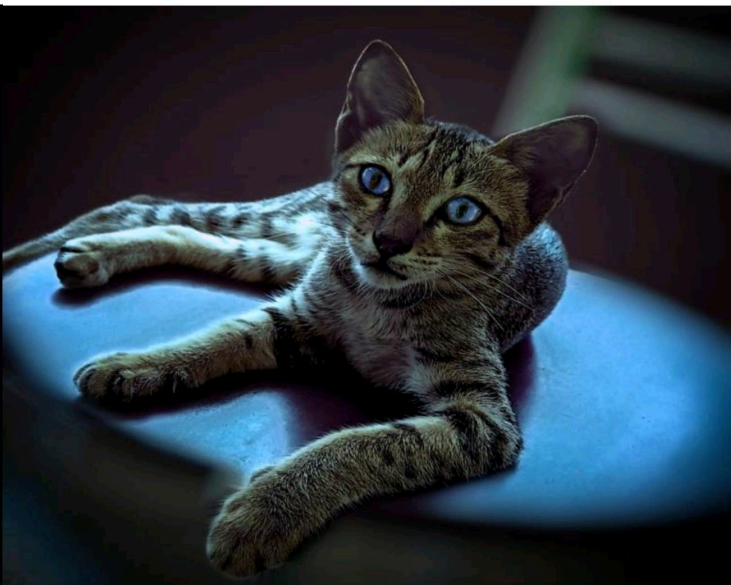
**A E Hemalatha**

**II - ECE B**

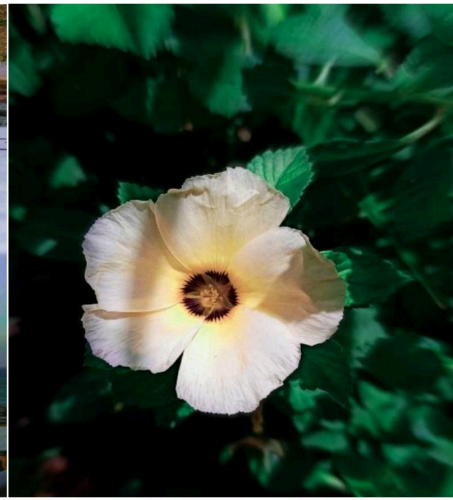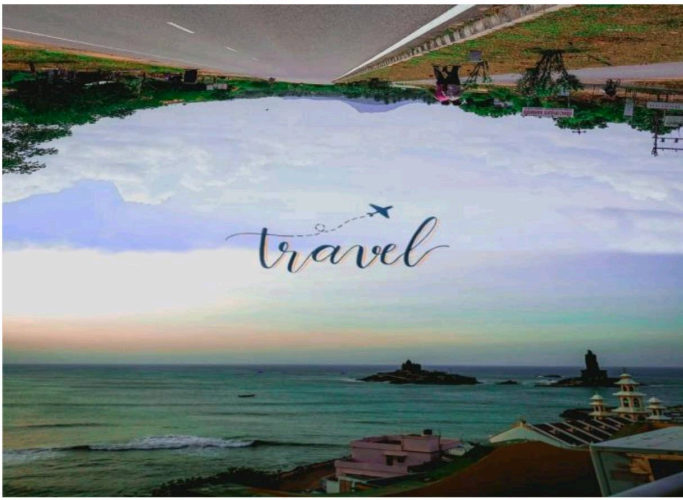# VISUAL ARTS
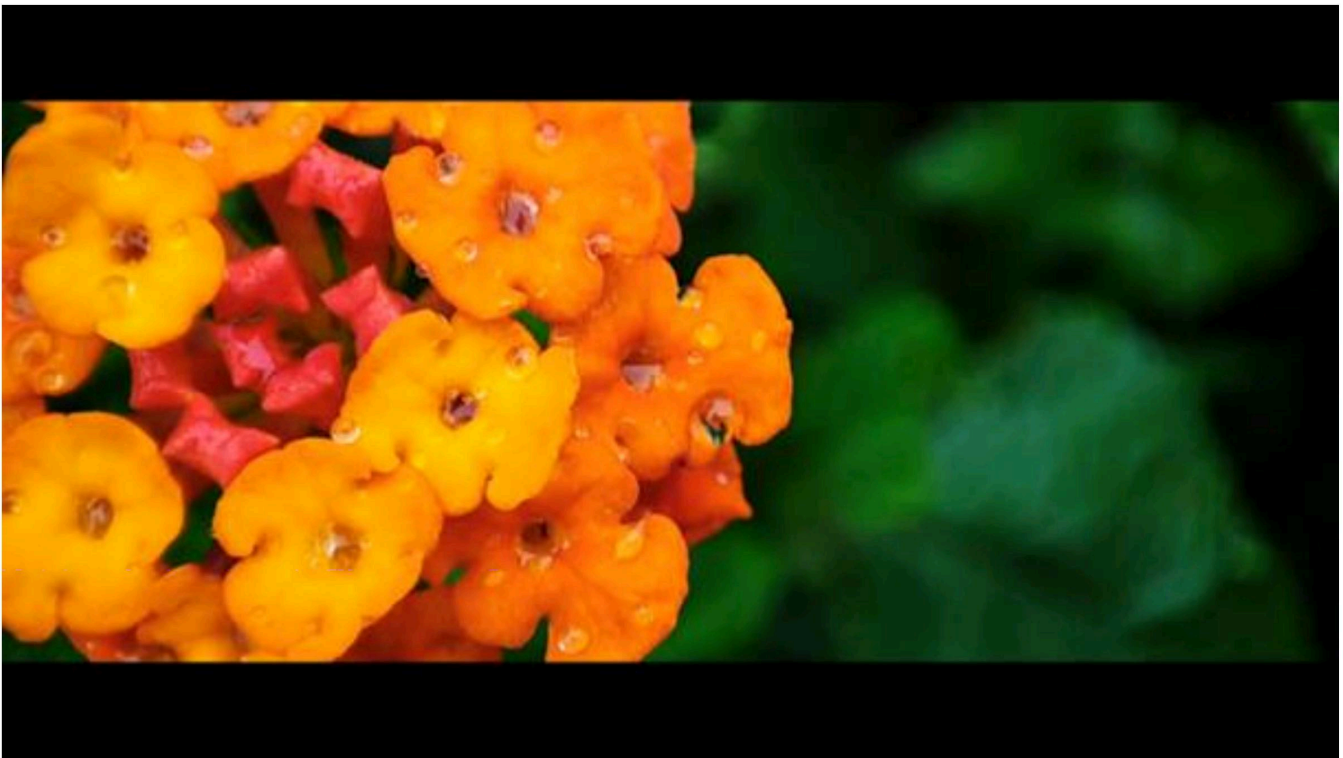
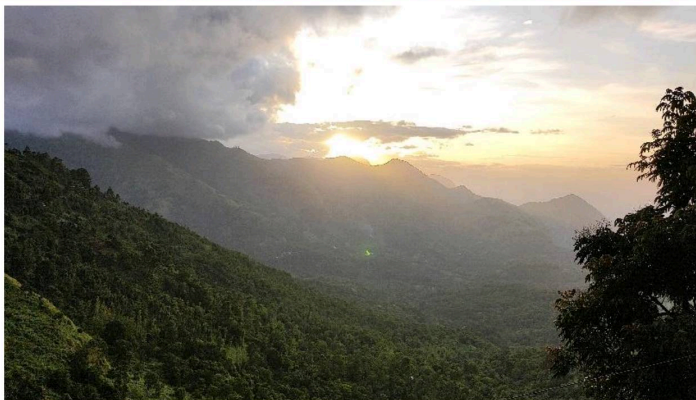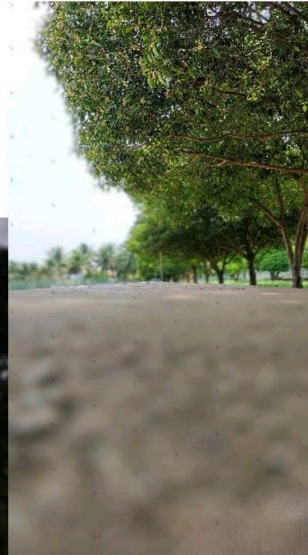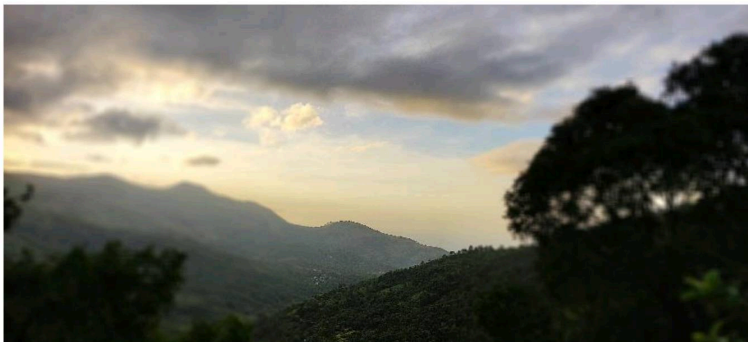**JAI AKKAYARAJKUMAR V J**
**II ECE A**

**PRIYADHARSHINI M**
**II- ECE A**

*Hiruthika . M. J*

*II ECE B*

*Aathitayah. U. R*

*II ECE B*