



# PRAMANA

*-A Promise of knowledge*

**By**

**Electronics and Communication Engineering  
Department**

**G.Narayanamma Institute of  
Technology and Science for Women**

**OCTOBER, 2023  
VOLUME 1 ISSUE 1**

## Message from The Principal



Dear Readers,

I am thrilled to extend my heartfelt greetings on the auspicious occasion of the unveiling of the Technical Magazine, “PRAMANA- A Promise of Knowledge”, focusing on the dynamic realm of Electronics and Communications Engineering. The Department of ECE, has consistently championed excellence, pushing the boundaries of knowledge and delving into new frontiers. This magazine stands as a testament to the ceaseless diligence, unwavering commitment, and fervent passion of our esteemed faculty and students who have continually made groundbreaking contributions to the field. Inside, you'll find a world of cutting-edge research, practical insights, and industry trends.

I implore each of you to embrace the spirit of innovation, curiosity, and lifelong learning that defines our field. I wish you an enlightening and enriching reading experience. May this magazine serve as a perennial source of inspiration and motivation for all of us as we collectively explore the limitless horizons of Electronics and Communications Engineering.

Warm regards,  
Dr. K. Ramesh Reddy,  
Principal, GNITS

## Message from Head of the Department



Dear Students, Faculty, and Enthusiastic Readers,

I am delighted to introduce the inaugural issue of our department's Technical Magazine, a platform that showcases the remarkable innovation and expertise within the field of Electronics and Communications. This magazine is the result of the relentless dedication and collective efforts of our talented students, faculty members, and the entire department. As the Chief Patron, I am honoured to witness this significant milestone in the journey of our department.

Electronics and Communications is a dynamic and ever-evolving field that plays a pivotal role in shaping the world we live in today. Our department has always been at the forefront of innovation, research, and education in this domain, and this magazine is a testament to our commitment to excellence.

This magazine represents more than just a collection of articles; it embodies the spirit of innovation, collaboration, and academic excellence that defines our department. Electronics and Communications is a field that drives progress in today's world, and our department has consistently demonstrated its prowess in both research and education.

I extend my heartfelt appreciation to all the contributors, editors, and everyone who has contributed to making this magazine a reality. Your dedication and hard work have truly paid off, and I am excited to see the impact this magazine will have in promoting knowledge-sharing and fostering innovation in our department.

In a world that is becoming increasingly interconnected and reliant on technology, the importance of our field cannot be overstated. I am confident that the articles and insights presented in this magazine will contribute to the advancement of Electronics and Communications and will inspire future generations to continue pushing the boundaries of what is possible.

I encourage all members of our department to actively engage with this magazine, share your thoughts, and contribute to its ongoing success. Let us use this platform to showcase our achievements, share our knowledge, and collaborate on projects that will shape the future.

Once again, congratulations to the entire team behind the Technical Magazine. May it continue to thrive and shine as a beacon of excellence for our department and the broader community.

Best wishes,

Dr. K. Ragini,  
Professor and Head, ECE Department, GNITS

## Editor in Chief's Message



Dear Readers,

It is with immense pleasure and pride that I welcome you to the inaugural issue of the brand new Quarterly Technical Magazine, "PRAMANA- A Promise of Knowledge" dedicated to the vibrant world of Electronics and Communications Engineering. This magazine represents a significant milestone in ECE Department's commitment to fostering knowledge, innovation, and collaboration among students and faculty. In an era marked by unprecedented technological advancements, the field of ECE is at the forefront of shaping our future. From the miniaturization of devices to the expansion of global communication networks, our discipline plays a pivotal role in driving progress and improving the quality of life for people around the world.

"Pramana- A Promise of Knowledge " aims to be a window into this dynamic domain. Our mission is to provide a platform for sharing knowledge, showcasing cutting-edge research, and promoting the exchange of ideas that will not only inspire our readers

but also contribute to the growth of our field. Within the pages of this magazine, you will find a rich tapestry of content. From reviews of emerging technologies to thought-provoking articles to fun quizzes and crossword puzzles. "Pramana- A Promise of Knowledge" is designed to cater to a wide range of interests within Electronics and Communications Engineering.

Our team of dedicated editors and contributors have worked tirelessly to ensure that each article is well-researched, insightful, and informative. We are also open to feedback from our readers, which will help us improve with each subsequent issue. I want to extend my gratitude to all those who have contributed to the realization of this magazine, from our talented writers to our diligent editorial team, and everyone who has supported us in this endeavour. Your passion and commitment are truly commendable.

As we embark on this exciting journey, I invite you to explore the pages of " PRAMANA- A Promise of Knowledge Vol. 1, Issue 1" with an open mind and a thirst for knowledge. I believe that through this magazine, we can forge stronger connections within our academic community, inspire innovation, and contribute to the advancement of Electronics and Communications Engineering.

Thank you for being a part of this exciting venture. Together, we will explore the boundless possibilities that lie ahead.

Warm regards,

Dr. Swapna Raghunath

Editor in Chief, Pramana - A Promise of Knowledge

ECE Department, GNITS

## Co-Editor's Message



Dear Readers,

I am highly elated and proud to announce that Electronics and Communication department is inaugurating the "PRAMANA- A Promise of Knowledge" Technical Magazine. G. Narayanamma College of Engineering provides a platform for every student to develop their learning skills through magazine. This magazine is a good platform that exhibits the literary skills, innovative ideas for faculty and students to build their career in broad areas of research. "PRAMANA - A Promise of Knowledge" presents the hard work and dedication of students and contributions of faculty. I would like to thank all my editorial team members for helping me pull this through. I express my considerable appreciation to all the authors of the articles in this magazine. These contributions have required a generous amount of time and effort. Wish

you all the best.

I am grateful for this opportunity to collaborate, Thank you.

Warm regards,

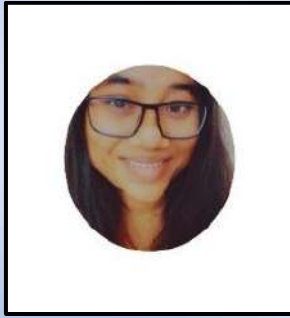
P. Lavanya,

Co-editor, Pramana – A Promise of Knowledge,

ECE, GNITS.



## The Editorial Board



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## 1. PATENTING IN INDIA

An invention relating either to a product or process that is new, involving inventive step and capable of industrial application can be patented. Patent is a statutory right for an invention granted for a limited period of time to the patentee by the Government, in exchange of full disclosure of his invention for excluding others, from making, using, selling, importing the patented product or process for producing that product for those purposes without his consent. Patent protection is a territorial right and therefore it is effective only within the territory of India. There is no concept of global patent. However, filing an application in India enables the applicant to file a corresponding application for same invention in convention countries or under PCT, within or before expiry of twelve months from the filing date in India. Patents should be obtained in each country where the applicant requires protection of his invention.

The patent system in India is governed by the Patents Act, 1970 (No.39 of 1970) as amended by the Patents (Amendment) Act, 2005 and the Patents Rules, 2003. The term of every patent granted is 20 years from the date of filing of application.

An invention is patentable subject matter if it is novel, has inventive step and capable of Industrial application. An invention cannot be patented if it is frivolous, or claims anything contrary to well established natural laws or contrary to public order or morality. The mere discovery of scientific principle or the formulation of an abstract theory or discovery of any living thing or non-living substance occurring in nature cannot be patented. Also, the mere discovery of a new form of a known substance or the mere discovery of any new property or new use for a known substance or of the mere use of a known process or substances obtained by mere admixture resulting only in the aggregation of the properties of the components thereof the mere arrangement or re-arrangement or duplication of known devices each functioning independently of one another in a known way cannot be patented. A method of agriculture or any medical process or mathematical or business method or topography of integrated circuit or inventions relating to atomic energy cannot be patented.

An application for a patent can be filed as soon as possible and should not be delayed. All the patent applications are kept secret up to 18 months from the date of filing or priority date whichever is earlier and thereafter they are published in the Official Journal of the Patent Office which is published every week and available on the IPO website.

Patent application must be filed online the information relating to the patent application is published in the Patent Office Journal issued every Friday. This is also available in electronic form on the website of the Patent Office, [www.ipindia.gov.in](http://www.ipindia.gov.in). The Patent Office Journal contains information relating to patent applications which are published u/s 11A, post grant publication, restoration of patent, notifications, list of non- working patents and public notices issued by the Patent Office.

A patent application can be filed either by true and first inventor or his assignee, either alone or jointly with any other person. However, legal representative of any deceased

person can also make an application for patent. A patent application can be filed with Indian Patent Office either with provisional specification or with complete specification along with fee as prescribed in schedule I. In case the application is filed with provisional specification, then one has to file complete specification within 12 months from the date of filing of the provisional application. There is no further extension of time to file complete specification after expiry of said period. India has four patent offices located at Kolkata, New Delhi, Mumbai and Chennai. Each office has a separate territorial jurisdiction. The appropriate office for all proceedings including filing of the application depends normally where the applicant resides. In case of foreign applicants, it depends on the address for service in India given by such applicant. the applicant can make a request for early publication in Form 9 along with the prescribed fee.

Generally, in order to file an application, an applicant is required to file Form 1 which is a request for filing an application and Form 2 which is either a provisional or complete specification with drawings, if any. In addition to these, an abstract of the invention is also required. If the application is filed through a registered patent agent, a power of authority in Favor of the said agent in Form 26 is also required. However, depending upon various circumstances, the other forms may also be required. The application can be examined only after receipt of request for examination on Form 18/18A.

The examination is done only after receipt of the request of examination in Form 18 either from the applicant or from third party or Form 18A for expedited examination. The request for examination can be filed within a period of 48 months from the date of priority or date of filing of the application whichever is earlier. After examination, the Patent office issues an examination report to the applicant which is generally known as First Examination Report (FER). Thereafter the applicant is required to comply with the requirements within a period of 6 months from the date of FER which can be extended by 3 months. In case, the application is found to be in order for grant, the patent is granted, provided there no pre-grant opposition is filed or pending. A letter patent is issued to the applicant. However, in case a pre-grant opposition is pending, further action is taken after disposition of the pre-grant opposition. If the applicant does not file a reply within 6 months or does not take an extension of 3 months, the application is deemed to have been abandoned.

If applicant has not complied with the requirements within the prescribed time, the Controller shall provide an opportunity of being heard to the applicant before refusing his application if a request for such hearing has been made by the applicant at least 10 days in advance before expiry of the statutory period.

**NOTE:** *The quiz questions related to patents will be published in the next issue of magazine.*

**DR. CHANDRASHEKHAR  
PASEDDULA, Asst. Prof**



## 2. EMPOWERING THE VISUALLY IMPAIRED WITH 3D PRINTING: TACTILE GRAPHICS FOR INCLUSIVE LEARNING

**Abstract** - 3D printing is making remarkable strides by providing a new way for visually impaired individuals to perceive and understand the world around them. One of its most significant applications is in the creation of 3D paper prints, which serve as tactile graphics designed specifically for the blind and visually impaired community. In this article, we explore the profound impact of 3D paper prints and how they are transforming education, art, and daily life for individuals with visual impairments.

### Introduction

In an era of inclusive education, where diversity and accessibility are prioritized, it is imperative that we explore innovative approaches to accommodate students with visual impairments. The incorporation of 3D tactile graphics into educational settings presents a transformative opportunity to provide an inclusive learning environment. This proposal outlines the significance and benefits of utilizing 3D tactile graphics in education and suggests a plan for implementation.

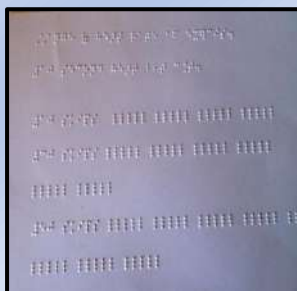
### Background

Visual aids and instructional materials have long played a crucial role in education. However, these resources often fall short in addressing the needs of students with visual impairments. Traditional 2D visual representations in textbooks and on whiteboards are inaccessible to these students, limiting their ability to grasp complex concepts in subjects like science, mathematics, geography, and art.

### The Role of 3D Tactile Graphics

3D tactile graphics, created through 3D printing technology, offer a tactile means of conveying information to students with visual impairments. These tactile graphics can represent a wide range of educational content, including:

**Diagrams and Charts:** Complex scientific diagrams, mathematical graphs, and statistical charts can be transformed into tactile graphics, enabling students to explore and comprehend these subjects through touch.



*Fig. 1 Tally Chart*



*Fig. 2 India Physical map*

**Maps:** Tactile maps provide students with the ability to understand geographic features, historical locations, and spatial relationships, enhancing their knowledge of geography and history.

**Art and Cultural Education:** 3D tactile graphics make it possible for visually impaired students to engage with and create art. They can explore famous artworks and cultural artifacts in a tactile format, fostering a deeper understanding of art and history.

**Braille Materials:** 3D printing technology can be used to create customized Braille books and educational materials, making learning resources more accessible to students with visual impairments.

### IV. Benefits of Implementing 3D Tactile Graphics in Education

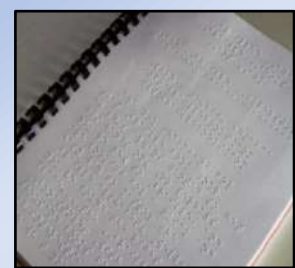
Inclusivity, Improved Comprehension, Enhanced Engagement, Increased Independence, Broader Curriculum.

### VI. Conclusion

Incorporating 3D tactile graphics into education is a transformative step toward creating an inclusive learning environment where students with visual impairments can thrive. This proposal outlines the significance of this approach, the benefits it offers, and a practical plan for implementation. By embracing 3D tactile graphics, we can ensure that all students have equal access to education and the opportunity to excel in their studies.



*Fig. 3 Palm*



*Fig. 4 Braille notes*

**DR. C. PADMAJA,**  
Asst. Prof





### 3. METAVERSE EXPLAINED

Have you ever wondered that we all can enter into a different world which don't occupy space or land physically. That's Metaverse, the literal meaning of metaverse is



“Beyond Universe”. It's an artificial world that feels like a real one, we enter into a 3D world in the shape of our Avatars (a fig representing ourselves) where we'll be able to do anything we can imagine, we can get together with family or friends, can conduct meetings, play, shop etc...

It is a next platform and medium that will be even more immersive, embodied internet where we are in the experience not just looking at it. It is the successor state of today's mobile, internet. It is often depicted as a persistent online world that can be accessed by anyone regardless of their physical location.

So far, we have achieved metaverse in parts:

**Virtual Reality-** Using gadgets like VR headsets, user can explore and interact in an immersive 3D environment.

**Augmented Reality-** AR helps enhancing the real physical world through the use of digital visual elements, sounds and other sensory stimuli.

**5G wireless technology** having massive network capacity.

**Block chain-** As we are talking about another new world so there comes the term “Ownership” of digital assets like land, clothing, weapons and many more, where and transparent way to track the owners of some asset.

**Cryptocurrency:** It enables users of blockchain-powered virtual worlds to buy and sell digital assets, such as virtual land, real estate or avatar items.

At present games like Sandbox, Minecraft, etc... are the examples of types of metaverse that allows the user to build and explore virtual world. When all the above-mentioned technologies and other emerging technologies are integrated and bought up, that makes the METAVERSE.

There are many applications of Metaverse:

immersive learning experience, thrilled entertainment experience, efficient virtual meetings, trading and buying. It can also help us reduce the Global temperature.

The challenges while attaining metaverse: we need high speed internet, ensuring Privacy and Security, highly expensive gadget and social acceptance.

Even though metaverse seems to be so much interesting, we might leave and abandon ourselves from the real life. We might start spending our lives virtually.

The metaverse has the potential to revolutionize how we connect, play, work, and learn, opening up exciting new possibilities for human interaction and creativity.

**N. ANJALI RATHOD**  
21251A0448,3/4



### 4. VIRTUAL REALITY: A FUTURE TECHNOLOGY



Virtual Reality (VR) is a computer-generated environment with scenes and objects that appear to be real, making the user feel they are immersed in their surroundings. This

environment is perceived through a device known as a Virtual Reality headset or helmet. It is fully immersive and everything we see is part of an environment artificially constructed through images, soundest. On the other hand, in augmented reality (AR), our own world becomes the framework within which objects, images or similar are placed. Everything we see is in a real environment and it may not be strictly necessary to wear a headset. Virtual reality allows users to create simulated, interactive, and specifically designed environments for specific use. It is designed for interaction or for a specific reason to create experiences. Unlike other reality technologies like AR and MR, VR enhances the user experience to the next level with its fully immersive and interactive technology. VR technology often comprises headgear and peripherals such as controllers and motion trackers. The technology is available through a web browser and is powered by proprietary downloaded apps or web-based VR. Sensory peripherals like controllers, headphones, hand trackers, treadmills, and 3D cameras are all part of virtual reality hardware. Virtual Reality is one of the technologies with the highest projected potential for growth. According to the latest forecasts from IDC Research (2018), investment in VR and AR will multiply 21-fold over the next four years, reaching 15.5 billion Euros by 2022. In addition, both technologies will be key to companies; digital transformation plans and their spending in this area will exceed that of the consumer sector by 2019. It is, therefore expected that by 2020 over half of the larger European companies will have a VR and RA strategy.

#### APPLICATIONS:

VR creates opportunities to conduct activities virtually, for example creating virtual excursions or field trips towards education.

Virtual reality has a huge influence on the Healthcare industry. The FDA authorized the prescription-use Ease V Rx for pain reduction in adults in November 2021. Cognitive behavioral therapy as well as other behavioral concepts like attention-shifting, interoceptive awareness, and deep relaxation are used in this system to aid in decreasing chronic pain.

**SHIVANI GOKUL**  
21251A0427,3/4



## 5. THE IMPACT OF INTERNET

The history of the internet begins with the invention of computers in the 1950's. It serves as a big influence on our everyday lives and it has changed our lives tremendously by creating new ways for us citizens to communicate, congregate, and share information of a social nature. The Internet has many advantages and will continue to change the way we live. Internet usage is involved in everyday tasks that were once done mostly through personal interaction, such as banking, shopping, or communication. Now, we can complete those tasks from the safety of our homes, jobs, or even schools. We also use the internet to find information such as for research or to get directions. The Internet has also transformed the educational sector, making it easier for people to access information and learn new skills. With just a few clicks, we can find a wealth of knowledge on any topic we're interested in. Often at no cost! The Internet has also made it possible for people to take professional online courses and earn certifications from the comfort of their own homes. Gone are the days of only sending letters, telegrams, and faxes to communicate with people on the other side of the globe. The Internet has made it possible for us to connect with others instantly and effortlessly, regardless of location. We can now easily access breaking news as it happens and share our thoughts and opinions with the world through social media. The internet is both so expansive and so unlike anything that has come before it, that it has created multiple whole new industries of jobs. These include jobs that are directly connected to how it works, like web developers and designers, but also jobs with an indirect link, such as e-commerce and digital marketing. In creating these jobs, the internet stimulates the economy and reduces unemployment. The fact that these jobs can be done from anywhere in the world also means that it improves the situation in less powerful economies without any barriers. The internet does not only help the job market by creating new jobs. It also makes existing jobs easier and more convenient to do, as well as more effective. The Internet has also transformed the entertainment industry. We can now access a wide range of movies, music, and games online and even play online casino games from the comfort of our own homes. The Internet's drawbacks can't be overlooked any longer as numerous teenagers are affected by Internet Addiction Disorder. Many people suffer from this problem as they are addicted to the Internet and use their devices without thinking about the time they wasted on the device. Internet addiction is detrimental to not only fitness but also psychological state. Spam's, Cyber Crime can lead by Hacker programs a virus that gets into the pc and ruins valuable data. Less interaction and face-to-face communication, etc.

It affects development of attention span, memory skills, language acquisition, abilities for critical reasoning, reading, and learning abilities. It is indeed fair to say that life would be tough without the internet. But there are two sides to a coin. The Internet can be an advantage and can also be a disadvantage to anyone. It totally depends on the person and how he/she uses it. If the user uses it for growing

their knowledge or learning or some meaningful work, it is an advantage for him/her.

**MALAVIKA RAOLAKOLU**  
22251A0488,2/4



## 6. THE MYSTICAL ELEGANCE OF SUN HALOS



In the vast canvas of the sky, nature often paints its most enchanting masterpieces. One such ethereal creation is the sun halo, a mesmerizing optical phenomenon that transforms the sun into a radiant, celestial jewel. Join us on a journey as we unveil the mystique and beauty of sun halos, a sight that captivates all who are fortunate enough to witness it. A sun halo is a captivating spectacle that occurs when sunlight interacts with ice crystals suspended in the Earth's atmosphere. These tiny, hexagonal ice crystals, often found in high-altitude cirrus clouds, act as prisms. When sunlight passes through them, it undergoes refraction and reflection, forming a dazzling ring or halo around the sun. Sun halos come in various forms, each possessing its own unique allure. The most common is the 22-degree halo, a circular ring with a radius of approximately 22 degrees around the sun. Beyond this, you may encounter intriguing tangent arcs, parhelia (sun dogs), and more, creating a celestial spectacle that truly defies imagination.

Throughout history, sun halos have held profound cultural significance. In some cultures, they were considered portals to otherworldly realms. Tales and legends abound, adding to the allure of these natural wonders.

For photographers and skywatchers, capturing the magic of sun halos can be a deeply rewarding pursuit. The play of light and ice crystals offers unique opportunities for creative and stunning photographs. To capture their brilliance, use a polarizing filter and a camera with manual settings, and always remember to protect your eyes from the sun's direct rays.

While sun halos are natural phenomena, they are not immune to environmental factors. Pollution, particularly from urban areas, can reduce visibility and the vibrancy of the halo. Therefore, the conservation of clean air and minimizing light pollution are essential to ensure that future generations can continue to witness this breathtaking spectacle.

In a world filled with technological wonders, there's something profoundly humbling about witnessing the grandeur of a sun halo. It's a reminder that nature, with all its scientific precision and artistic flair, can still surprise and amaze us. So, keep your eyes to the sky, for you never know when the heavens will grace you with the celestial magic of



a sun halo, a breathtaking reminder of the beauty that surrounds us, even in the most unexpected places.

**Juweria Mohammed Faiyaz**  
22251A04B1,2/4

## 7. SiC ELECTRONICS



In a world of technology new ideas are like sparks of innovation that show us the way forward. Silicon Carbide is one of these incredible

sparks. It is making our electronic gadgets better and brighter. Silicon Carbide is also known shortly as SiC. Silicon carbide offers a significantly higher breakdown strength than silicon. It is a compound semiconductor composed of silicon and carbon. It is uniquely characterized by its wide bandgap, a feature that differentiates it from regular silicon. Silicon carbide is very good when it comes to handling electricity. It can manage high voltages with less space and it's good at powering advanced electronic switches.

### Advancements in technology due to SiC:

**High-Temperature Electronics:** SiC's can operate in high temperatures has led to achievements in automotive and aerospace applications.

**Energy Efficiency:** SiC power devices have improved the energy efficiency of various electronic systems also improved longer battery life in electric cars and increased power conversion efficiency in renewable energy sources like solar and wind.

**Reduced Carbon Footprint:** Achievements in reducing the carbon footprint of various industries have been made possible by SiC electronics, particularly in electric transportation and renewable energy.

**Wireless Communication:** This improved the performance of wireless communication networks, achievements in faster data transfer rates and reduced signal interference.

**Faster Charging:** SiC based chargers and power converters have enabled faster charging times for electric vehicles and mobiles. These are few of the advancements in technology due to SiC.

Silicon Carbide electronics are like brilliant sparks in electronics industry. They have unique properties like wide bandgap, high-temperature Resistance, less power consumption etc. These properties make them super useful in lots of different areas like making energy more efficient, improving things in space and development in communication. As we move towards a more sustainable and technologically advanced future, silicon carbide

electronics will play a important role in new innovations in technology.

**MANASA PILLI**  
21251A0485,3/4



## 8. PRINTED CIRCUIT BOARDS



A printed circuit board (PCB) is a flat piece of insulating material with a thin layer of copper on one or both sides. The copper is etched in a pattern to create electrical connections between the

components that are mounted on the board. PCBs are used in a wide variety of electronic devices, including computers, smartphones, TVs, and appliances.

The function of a PCB is to provide electrical connection and mechanical support to the electrical components of a circuit. The copper traces on the PCB provide the electrical connections between the components, and the insulating material prevents the components from touching each other and causing a short circuit. The PCB also provides mechanical support for the components, keeping them in place and preventing them from moving around.

There are many different types of PCBs, each with its own specific design and features. The type of PCB used in a particular device depends on the size, complexity, and performance requirements of the device.

### Some of the common types of PCBs:

**Single-layer PCBs:** These PCBs have one layer of copper. They are the simplest and least expensive type of PCB.

**Double-layer PCBs:** These PCBs have two layers of copper, one on each side of the insulating material. They are more complex and expensive than single-layer PCBs, but they can provide more electrical connections and are more compact.

**Multilayer PCBs:** These PCBs have more than two layers of copper. They are the most complex and expensive type of PCB, but they can provide the most electrical connections and are the most compact.

PCBs are an essential part of modern electronics. They allow us to create complex and powerful electronic devices that are small, lightweight, and affordable.

### Here are some of the benefits of using PCBs:

They provide a compact and efficient way to connect electronic components.

They can be mass-produced, which makes them cost-effective.

They are lightweight and durable.

They can be designed to meet the specific needs of a particular device.

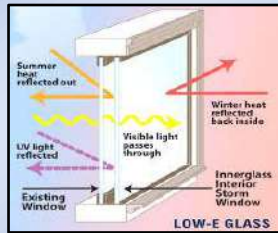


PCBs are a vital part of the modern electronics industry. They are used in a wide variety of devices, from computers and smartphones to TVs and appliances. As the electronics industry continues to grow, the demand for PCBs is expected to grow as well.

**SRIJA DAVU**  
21251A0473,3/4



## 9. HIGH PERFORMANCE GLASS: A WINDOW TO SUSTAINABLE BUILDING MATERIALS



In the ever-evolving world of construction and environmental technologies, the pursuit of sustainability has become vital, among the many innovations that are reshaping the construction landscape, high-performance glass stands out as

a material that not only redefines architectural aesthetics but also plays a pivotal role in building a more sustainable future.

### Balancing Aesthetics with Efficiency

Glass has long been celebrated for its transparency and ability to create a sense of openness within structures. However, the conventional glass used in construction often caused difficulties in energy efficiency. The high-performance glass, on the other hand, enhances aesthetics with efficiency, transforming the way we think about building materials.

### Energy Efficiency Through Smart Design

One of the defining characteristics of high-performance glass is its ability to control the transfer of heat and light. By incorporating low-emissivity (low-e) coatings, this glass reduces heat exchange, effectively insulating interiors from external temperature fluctuations. This translates into lower energy consumption for heating and cooling, a characteristic of sustainable architecture.

### Harnessing Natural Light and Solar Control

High-performance glass is not just about energy savings; it is also about optimizing the use of natural resources. These glasses can be constructed to allow abundant natural light to flood indoor spaces while utilizing solar heat gain. This duality ensures that occupants enjoy well-lit interiors without compromising on comfort.

### Reducing Carbon Footprints

The environmental implications of high-performance glass are significant. By minimizing the energy needed to maintain indoor comfort, it plays a crucial role in reducing carbon emissions. This aligns completely with global efforts to combat climate change and features its importance in advancing sustainability objectives.

## Green Building Certifications and High-Performance Glass

High-performance glass is a key element in achieving green building certifications like LEED and BREEAM. Incorporating this glass into construction projects often results in higher sustainability ratings, making properties more attractive to environmentally conscious investors and residents.

### Advancements in Sustainable Glass Technology

The field of environmental technologies continually pushes the boundaries of high-performance glass. Smart glass technologies have emerged, allowing users to electronically adjust transparency. This not only enhances user comfort but also optimizes energy usage by adapting to changing environmental conditions.

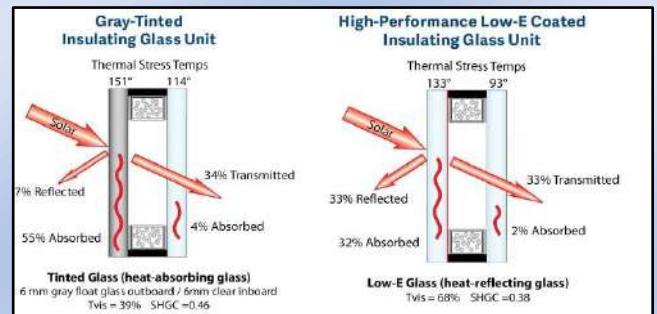
### Enhancing Health and Well-being

High-performance glass goes beyond energy efficiency; it contributes to occupant health and well-being. By offering abundant natural light and maintaining comfortable indoor temperatures, it raises spaces that promote productivity, reduce eyestrain, and positively impact mental health.

### In Conclusion

High-performance glass is a combination of aesthetics and sustainability. Its capacity to enhance energy efficiency, maximize daylighting, reduce carbon emissions, and enhance occupant comfort makes it an essential component of sustainable architecture. In a world where environmentally conscious construction practices have become essential, high-performance glass shines as a symbol of innovation and a sign of our commitment to a greener, more sustainable planet.

As architects, builders, and environmental advocates come together to create spaces that coexist harmoniously with nature, high-performance glass takes centre stage, shaping the sustainable, eco-friendly cities of tomorrow. It is a material that not only displays the beauty of transparency but also symbolizes our collective dedication to building a brighter, more energy-efficient future.



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## 10. WIRING A SMARTER FUTURE: UNVEILING THE POWER OF NEUROMORPHIC COMPUTING



As artificial intelligence technology advances, focus is shifting to neuromorphic computing and its potential to push AI to new heights of power and performance.

Neuromorphic computing is a branch of computer science that simulates the human brain and nervous system. It's a hardware and software computing element that combines several specializations, such as biology, mathematics, electronics, and physics.

While current AI technology has become better at outperforming human capabilities in multiple fields, such as level 4 self-driving vehicles and generative models, it still offers only a crude approximation of human/biological capabilities and is only useful in a handful of fields.

The Neuromorphic approaches, on the other hand, attempt to replicate actual underlying biological systems. This could lead to a better understanding of the physical processes involved and potentially could be more natural for users to adopt.

Neuromorphic computing offers a fundamentally different computational architecture than current computer platforms. Current computing architectures are based on von Neuman principles, such as separate memory and processing and binary representation "Neuromorphic computing is based on brain concepts such as neurons and synapses "Unlike traditional computing, which must be trained on a large amount of data, neuromorphic computing learns and adapts in real time, just like the human brain, and consumes relatively less energy than traditional AI algorithms."

The Neuromorphic Chip Market is expected to grow significantly from USD 0.08 billion in 2023 to USD 2.85 billion by 2028, with a remarkable CAGR of 104.70% during the forecast period (2023-2028). Leading companies in this market include Qualcomm, Intel, and IBM. Many experts believe neuromorphic computing has the ability to transform the algorithmic power, efficiency, and capacities of AI while also providing insights into cognition. However, neuromorphic computing is still in its early stages and faces various challenges such as accuracy, limited software and algorithms, inaccessible, benchmarks

It is believed that neuromorphic computing research is moving forward on several fronts. Advancements in neural networks, like world models, or large language models like GPT-4, are extending what will be possible for real-world use cases. Embracing neuromorphic computing technologies requires a fundamental shift in our approach to computing. The future progress in computer technology relies on our willingness to move away from traditional von Neumann systems, despite the challenges involved.

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## 11. THE BRIGHT FUTURE FOR DRONES: A REVOLUTION SOARING SKY HIGH



Over the past year we have seen drones become more relevant to people's lives. The technology has matured, and during the pandemic there has been a new urgency about finding new ways of accessing goods and services. In Ghana, drones delivered 13% of the country's initial shipment of COVID-19 vaccine in just 3 days. From enhancing agriculture practices to improving search and rescue missions, drones are poised for a bright and promising future. We may think like, there is a chance of launching a drone in the space with the advancement of new technologies.

This article highlights several key reasons why drones are poised for significant growth in the coming years:

**Technological Advancements:** Ongoing advancements in technology, including the miniaturization of components, improved battery life, and enhanced sensors, are making drones more efficient and accessible. As technology continues to evolve, drones will become even more capable, reliable, and cost-effective.

**Commercial Applications:** Drones are finding applications in a wide range of industries like construction, real estate, filmmaking, and even sports like cricket. Their ability to capture high-resolution images, collect data, and perform various tasks for businesses is driving increasing demand for drone services.

**Infrastructure Development:** Drones are becoming indispensable for surveying, mapping, and inspecting construction sites and critical infrastructure such as bridges and power lines. They can significantly reduce inspection times, improve safety, and save costs, making them essential tools for these industries.

**Connectivity and 5G Integration:** Integration with 5G technology enables real-time data transfer, remote piloting, and advanced communication capabilities, opening up new possibilities for applications like autonomous drone swarms for search and rescue missions.

**Healthcare and Emergency Response:** Drones are increasingly used in healthcare for medical supply deliveries, organ transport, and rapid medical emergency response. They also play a crucial role in disaster-stricken areas for damage assessment, survivor location, and supply delivery, potentially saving lives.

Drones have already proven their worth in various sectors, and their potential applications continue to expand. As they become more integrated into our daily lives and industries, we can expect drones to revolutionize how we work, live, and interact with the world around us. The sky is not the limit; it's just the beginning for drones.

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## 12. REVOLUTIONIZING ROAD MAINTAINANCE: A MOBILE APP FOR CIVIC ENGAGEMENT

In our rapidly changing world, innovation is vital for addressing civic problems. A recent hackathon produced a mobile app, using Google Maps API, that lets citizens report road and manhole issues directly to the Greater Hyderabad Municipal Corporation (GHMC). This streamlined approach has the potential to revolutionize urban road maintenance. Urban residents frequently face dangerous road conditions like potholes and hazardous manholes, causing vehicle damage and safety concerns. Reporting these issues can be cumbersome due to bureaucratic hurdles, resulting in delayed or ignored complaints. Prompt action is essential for a smoother and safer commute.

### App Description:

**User Registration:** To ensure accountability and traceability, the application prompts users to register with their essential details, including name, email, and phone number. This information establishes the identity of the complainant and also aids GHMC in tracking and verifying the reported issues.

**Location Tagging:** Integrating seamlessly with Google Maps API, the app allows users to pinpoint their precise location when reporting road problems. This feature is pivotal as it ensures GHMC receives accurate information about the issue's exact location, facilitating a swifter response.

**Photographic Evidence:** Users are empowered to upload images of the problematic road or manhole, providing GHMC with compelling visual evidence of the issue's severity. This visual context can significantly influence the prioritization of maintenance efforts.

**Time-Based Follow-up:** To ensure prompt resolution and accountability, the app prompts users to send updated pictures after a designated duration (e.g., 3 months). This innovative feature serves a dual purpose: it confirms that the required maintenance work has been carried out, and it verifies the effectiveness of GHMC's efforts over time.

The mobile app offers several benefits:

**Efficiency:** It streamlines the complaint process, allowing GHMC to address road problems promptly based on severity and location, improving road maintenance efficiency.

**Transparency:** Citizens can track complaint progress, enhancing transparency and trust in municipal authorities.

**Data-Driven Decision Making:** The app provides valuable data on road issues, guiding future maintenance, planning, and resource allocation.

**Civic Engagement:** Encourages citizens to participate in city upkeep, promoting a sense of community and shared responsibility for the urban environment.

This mobile application represents a significant stride toward modernizing the way we approach road maintenance and civic engagement. By providing citizens with a direct channel to report issues and take an active role in shaping the quality of their urban environment, this innovative

solution holds the potential to revolutionize road maintenance

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## 13. 5G NETWORK



India now boasts the world's second-largest 5G network and ecosystem. Bharti Airtel and Reliance Jio have collaborated to set up over 2.8 lakh sites. The government

has taken initiatives to expedite 5G rollout, including the GatiShakti Sanchar portal for right-of-way permissions. An Inter-Ministerial Committee is exploring sector-specific 5G use cases, benefiting education, agriculture, health, power, and more. 5G offers higher data speeds, low latency, increased network capacity, improved reliability, broader coverage, and support for innovation.

5G technology offers:

**Higher Data Speeds:** Faster downloads and seamless HD streaming.

**Low Latency:** Crucial for real-time applications like AR, VR, telemedicine, and autonomous vehicles.

**Increased Network Capacity:** Supports more connected devices, reducing congestion.

**Enhanced Reliability:** Mission-critical applications benefit from features like network slicing.

**Improved Energy Efficiency:** Energy-saving technologies extend device battery life and reduce environmental impact.

**Expanded Use Cases:** Enables innovations in healthcare, smart cities, factories, and connected vehicles, driving the Fourth Industrial Revolution.

### Disadvantages of 5G Network:

**Limited Coverage and Deployment Challenges:** 5G's higher-frequency radio waves have shorter range and are easily blocked by obstacles, necessitating a dense network of small cells for deployment. This can be costly and time-consuming, leading to limited coverage in rural areas.

**Potential Interference and Health Concerns:** Some express health concerns due to increased exposure to radiofrequency radiation, although scientific consensus suggests it's within safe limits. Concerns also exist about potential interference with other radiofrequency devices, like weather radar systems. Regulatory bodies and telecom companies are addressing these concerns through guidelines and standards.

In summary, 5G networks signify a substantial advancement in telecommunications, promising transformative benefits across industries and enhancing our digital interactions. It heralds a new era of connectivity, innovation, and limitless



possibilities that will reshape how we live, work, and engage with the world.

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## 14. CURRENT TRENDS IN MICROPROCESSORS



A microprocessor is a central processing unit (CPU) that is designed to perform arithmetic and logical operations and to manage the input/output (I/O) operations of a computer or other electronic device. It is a key component of modern computing systems, including desktop computers, laptops, tablets, smartphones and many other electronic devices. The first microprocessor was developed in the early 1970s and was used primarily in calculators and simple control systems. Since then, microprocessors have become much more powerful and versatile, with the ability to execute millions or even billions of instructions per second. They are typically fabricated using advanced semiconductors

Technologies, such as complementary metal oxide semiconductor (CMOS) technology, which allows for the creation of complex circuits on a small silicon chip.

Trends in the microprocessor worlds:

**Dual Core Microprocessor:** It is a CPU that has two distinct processors that work simultaneously in the same integrated circuit. The Intel Core Duo, AMD X2 and dual core PowerPC G5 are the examples of CPU's that use dual-core technologies.

**Quad Core Microprocessor:** It is a chip with four independent units called cores that read and execute central processing unit (CPU) instructions, such as add, move data and branch. The Intel Core 2 Quad, Intel Nehalem are the examples of CPU's that use quad core technologies.

**Penta Core Microprocessor:** It is an integrated circuit that implements five independent physical execution units on a single die. The Intel Core i3, AMD Ryzen 3 are the examples of CPU's that use Penta core technologies.

**Hexa Core Microprocessor:** It is a type of CPU with six independent processing units, also known as cores, working together to handle tasks. The AMD Phenom || X6 is an example of CPU that use hexa core technologies.

**Octa Core Microprocessor:** It is a processing system that have eight cores which are arranged in two sets of four cores, each core can perform the work as that of quad core processor. The Intel Xenon E5-1660 v3 is a example of CPU that use octa core technologies.

Microprocessors reduce cost of processing power, increase reliability focuses on real time applications and it is faster in speed. It is used in smallest embedded system to largest

main frames and super computers. Due to its wide varieties of uses it has revolutionized the human civilization.

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## 15. VLSI: VERY LARGE-SCALE INTEGRATION



VLSI began in 1970's and was founded in 1981 by Dan Floyd, Jack Baletto and Gunnar Wetlesen who had worked together at Signetics.

The VLSI technology allows for the creation of highly complex and powerful IC's. VLSI allows for the creation of ICs with high levels of performance, power efficiency, reliability, which are essential for many applications. The designing of VLSI involves a number of steps like defining requirements for IC, developing high level design, detailing design, verifying the design, fabricating the IC. The most common VLSI design are Programmable VLSI design, Non-Programmable VLSI design. In programmable VLSI design a circuit can be easily reconfigured to perform. Whereas Non-Programmable VLSI design cannot be easily modified once it is fabricated. To design complex chips and designs coding is required in VLSI to make detailed designs of the circuits. VLSI designers use a variety of programming languages and tools. Tools are used to design complex designs. Some of the most commonly used programming languages are Hardware Description Languages (HDL's) such as Verilog, VHDL, EDA tools, Mentor Graphics, Cadence etc. The VLSI is a technology where it is the process of creating an integrated circuit (IC) by combining millions or billions of MOS transistors onto a single chip is done. main advantage of VLSI design is it can reduce the amount of time and effort required to create a complex circuit. It can also make attractive for designers. It can offer high performance and precise control. But it may not offer the same level performance as a Non-Programmable VLSI design. Engineers use VLSI in data communication and networks. Wireless communication has achieved high due to applications of VLSI. The MOSFETs in power amplifiers are designed using VLSI. VLSI is a technology used in design and fabrication of IC's. This helps in integration of large number of transistors onto a single chip. VLSI shape the future technology, offer solutions to complex challenges. It plays a vital role in Electronics and Semiconductor technology. The future scope of VLSI engineers is very high as the world is full of electronic devices that control of microprocessors, microcontrollers. So, to design chips a lot of VLSI engineers are required. Indian government has implemented programs for the growth of VLSI technology in India. There are many top

companies and start-ups of VLSI in India such as Siemens, Qualcomm, Intel etc. VLSI can perform multiple and variety of functions in a single chip.

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## 16. NAVIGATING THE MICROSCOPIC MARVELS: VLSI INDUSTRIES AND OPPORTUNITIES FOR ASPIRING ENGINEERS

### Introduction:

The world of technology is constantly evolving, and one field that has been at the forefront of this evolution is Very Large-Scale Integration (VLSI). VLSI technology has revolutionized the way electronic devices are designed and manufactured, playing a crucial role in the development of modern electronics. For aspiring engineers, the VLSI industry offers a plethora of opportunities to explore and contribute to cutting-edge innovations. In this article, we will delve into the VLSI industry, its significance, and the promising career prospects it offers to those willing to embark on this exciting journey.

### Understanding VLSI:

VLSI refers to the process of integrating a large number of transistors, electronic components, and functions onto a single silicon chip. This miniaturization of electronic components has allowed us to create powerful, energy-efficient, and compact devices that have become an integral part of our daily lives. Everything from smartphones and laptops to medical devices and automotive systems relies on VLSI technology.

### The Significance of VLSI:

**Miniaturization:** VLSI technology has made it possible to pack billions of transistors onto a single chip, leading to smaller and more powerful devices.

**Energy Efficiency:** With VLSI, it's possible to design chips that consume less power, contributing to longer battery life in portable devices and reduced energy consumption in data centres.

**High Performance:** VLSI enables the creation of high-performance processors, memory chips, and specialized integrated circuits (ICs) that drive the capabilities of modern electronics.

**Cost Reduction:** By integrating multiple functions onto a single chip, manufacturing costs can be significantly reduced, making electronic products more affordable.

**Opportunities in VLSI:** The VLSI industry offers diverse career opportunities for engineers with varying interests and skill sets. Here are some prominent career paths within the VLSI sector:

**Design Engineering:** Design engineers work on the architecture and layout of integrated circuits. They are responsible for creating the blueprints of electronic chips and optimizing their performance.

**Verification and Validation:** This role involves testing and verifying the functionality of VLSI designs to ensure they meet specifications and perform as intended.

**Physical Design:** Physical design engineers focus on the physical layout and implementation of VLSI chips, ensuring that they can be manufactured efficiently and without defects.

**Analog and Digital Circuit Design:** Engineers specializing in analogue and digital design work on specific aspects of integrated circuits, such as signal processing, data communication, or power management.

**FPGA Development:** Field-Programmable Gate Arrays (FPGAs) are widely used in prototyping and specialized applications. Engineers in this field work on FPGA design and programming.

**Research and Development:** Research engineers explore new materials, technologies, and design methodologies to push the boundaries of VLSI capabilities.

**Manufacturing and Quality Control:** Engineers in this domain oversee the manufacturing process, ensuring that chips are produced with high precision and quality.

### Education and Skill Requirements:

To enter the VLSI industry, aspiring engineers typically need at least a bachelor's degree in electrical engineering or a related field. Advanced positions may require a master's or Ph.D. degree. Key skills for success in the VLSI field include:

- Proficiency in programming languages like Verilog and VHDL.
- Strong knowledge of digital and analogue electronics.
- Familiarity with CAD tools used in VLSI design.
- Problem-solving and analytical skills.
- Understanding of semiconductor physics and fabrication processes.

### Conclusion:

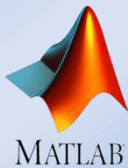
The VLSI industry plays a pivotal role in shaping the future of electronics, making it an exciting field for aspiring engineers to explore. Whether you are interested in designing cutting-edge chips, optimizing their performance, or researching new technologies, the VLSI industry offers a range of opportunities to make a meaningful impact on the world of technology. With the right education and skill set, you can be a part of the microscopic marvels that power our modern world. So, if you have a passion for innovation and a keen interest in electronics, consider VLSI as a promising career path that will allow you to navigate the fascinating world of microscopic marvels.

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## 17. OVERVIEW OF MATLAB



MATLAB, a software package developed by Cleve Moler, is an essential tool for engineers across the globe. It serves as a versatile platform for tasks ranging from design and optimization to data visualization and hardware simulation. This interactive

programming environment for scientific computing is a product of MathWorks, based in Natick, Massachusetts, USA.

The success of MATLAB can be attributed to several key factors. Its intuitive and concise syntax simplifies complex tasks, making it accessible to both novices and experts. The use of complex matrices as the default numeric data object is a fundamental feature, allowing engineers to work naturally with mathematical operations. Built-in operators provide powerful capabilities, while the software's graphics are easily utilized for data representation. Moreover, MATLAB offers a straightforward and user-friendly programming environment, facilitating extensions of the language to adapt to specific needs.

Cleve Moler, a numerical analyst specializing in matrix computation, originally developed MATLAB in response to the need for user-friendly interfaces to mathematical libraries. It was born out of his involvement in the creation of EISPACK and LINPACK, FORTRAN-based libraries for eigenvalue calculations and solving linear equations, respectively.

MATLAB's interactive and interpreted nature eliminates the need for variable declarations, offering flexibility in assigning values to variables. Notable notational innovations, such as matrix concatenation and element-wise operations, enhance its efficiency. The software supports multiple function outputs, contributing to its versatility. Additionally, MATLAB mitigates common programming bugs that often lead to early terminations or unpredictable behaviour in languages like FORTRAN and C.

The inclusion of infinity values, tightly integrated graph plotting features, and the ability to develop Graphical User Interface (GUI) applications further expand MATLAB's utility. The Simulink package extends its capabilities, enabling graphical multi-domain simulation and model-based design for dynamic and embedded systems.

As of 2020, MATLAB boasts over 4 million users worldwide, spanning various fields, including engineering, sciences, and economics. Over 5,000 global colleges and universities rely on MATLAB to support both instruction and research, cementing its status as an indispensable tool in the world of scientific computing and engineering.

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## 18. ADVANCING MEDICAL DEVICES THROUGH MATLAB: A POWERHOUSE FOR INNOVATION

MATLAB is a programming and numeric computing platform used by millions of engineers and scientists to analyse data, develop algorithms. In the present generation, along with the development of the technology in the IT sector, it is also a need for the development of the medical sector. Medical devices identify the complex diseases and suggest the remedy to it. And this is done easily by MATLAB, as it develops particular algorithms by analysing the data given to it. MATLAB simulates and models the data, it also has signal processing toolbox, it is also capable of implementing AIML algorithms and has a capability to rapid prototyping. The following ways are of how it is done in detail.

**Simulation and Modelling:** MATLAB also has capability to simulate the complex systems and model them accordingly which makes the user friendly. This capability is especially benefit for the design of devices like pacemakers, insulin pumps and prosthetic limbs.

**Signal Processing:** We know that medical devices often deal with image processing and the signals are sent to ECGs, EEGs, and MRI images. MATLAB has its own image processing toolbox which provides a wide array of tools for analysing and processing these signals. Although MRI image processing is a complex task, MATLAB's signal processing capabilities can be employed to improve image quality by reducing noise leading to an accurate model.

**Machine learning and Artificial Intelligence:** Now a days AIML is booming all over the world, as it provides lot of real time applications in all the fields. Even in the medical field also it plays a major role. Though AIML has different algorithms, MATLAB offers a comprehensive algorithm which is easily understood, making it possible to create intelligent medical devices. These devices, for instance, predict patient outcomes, detect abnormal signs and assist the surgical procedures. One such capability is that, an intelligent infusion pump that predicts the abnormal changes in a person, allowing real time monitoring and potentially saving lives.

**Rapid Prototyping:** One of the important features of the MATLAB is that, its quick iteration and prototyping. It seamlessly integrates with hardware, allowing engineers to design and test prototypes. This accelerates the prototyping process, reduces costs and ensures that devices work faster. One such implementation is seen in continuous glucose monitoring. It develops the algorithms, enabling rapid iterations until exact design is achieved.

**Regulatory Compliance:** Apart from the developing the algorithms, it provides tools for validation and verification and provides high efficiency. In the development of an automated insulin delivery system, MATLAB helps in generating comprehensive documentation and conducting rigorous testing.

**Conclusion:** Therefore, MATLAB has become an indispensable ally in the development of innovative medical

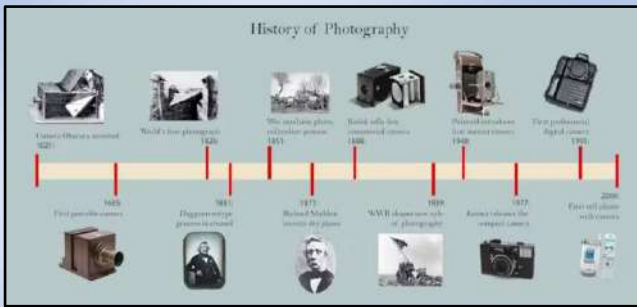


devices. Its versatility in simulation, signal processing, machine learning, rapid prototyping and regulatory compliance position it as a go-to tool for engineers, researchers. We can expect MATLAB to play an increasingly pivotal role in shaping the future of healthcare and deliver safe and effective medical devices to patients.

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## 19. THE EVOLUTION OF PHOTOGRAPHY



Have you ever wondered how we are able to take pictures with the help of a camera! Be it Digital camera or a DSLR, we are able to capture our special moments through these devices. Photography has come a long-long way since its beginnings in the 19th century. Taking a photo used to require minutes of exposure which resulted in a grainy black and white image. Let us see how exactly cameras go from the stage of generating fuzzy, black and white images to the stage where we are using digital cameras of high resolution for taking pictures.

Johann Zahn proposed a handheld reflex camera design in 1685, but it was only realized in 1816 by Joseph Nicéphore Niépce, who used silver chloride-coated paper that produced negative images. Early camera prototypes were inspired by the Camera Obscura, projecting outside light onto a wall. In 1800, Thomas Wedgwood experimented with light-sensitive substances to preserve Camera Obscura images, but the results were grainy and faded quickly. This paved the way for the Daguerreotype, the first commercially available photographic process. Leading up to its public introduction in 1839, Louis Daguerre perfected his photographic process. It included polishing a silver-plated copper sheet, treating it with iodine vapor for light sensitivity, developing the image with heated mercury, and "fixing" it in hot salt water. Unlike Niépce's negatives, Daguerreotypes produced positive images and took only a few minutes to complete.

Calotype or talbotype, introduced by William Henry Fox Talbot in 1841, was an early photographic process using paper coated with silver iodide. However, its limitations included texture effects on paper, making it less capable of

recording low-contrast details and textures. Talbot initially used paper sensitized with silver chloride for his "photogenic drawing" process, requiring very long exposures of an hour or more to produce acceptable negatives. The calotype process generated translucent negative images that could be used to create multiple positive prints via contact printing, providing an advantage over the daguerreotype.

Throughout the 20th century, photography technology matured under the stewardship of companies like Leica, Nikon, and Canon. Affordable 35mm cameras emerged in the 1950s, some with instant printing capabilities, like the Polaroid instant camera in 1948.

The late 20th century brought digital photography, starting with the Sony Mavica in 1981. It featured an electronic image sensor, eliminating the need for film. The rise of smartphones in the early 21st century made photography even more accessible and widespread, with virtually every phone featuring a camera.

It's hard to imagine a world without cameras. Today, everyone has a high-resolution camera sitting in their pocket, capable of preserving a memory with a simple click of a button. As far as technology has come, a camera's basic function remains the same.

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## 20. ART OF PHOTOGRAPHY: LIVE IS FULL OF MEMORIES, REMEMBER THEM



Photography is a beautiful way of teleporting the past into the future, preserving memories so we don't forget our history. Similarly, art serves as a

means of remembering and creating, using various colours, supplies, and techniques to bring ideas to life. Just as artists need to blend colours and employ different techniques for various forms of art, photographers need to understand the fundamental features of a camera. Especially for beginners. For beginners, it's essential to understand these three basic features of a camera:

**Shutter Speed:** Shutter speed controls how long the camera's sensor or film is exposed to light. A faster shutter speed (e.g., 1/1000) captures fast-moving subjects without

blurring, while a slower speed (e.g., 1/30) can create motion blur or capture more light in low-light conditions.

**Aperture (F-stop):** Aperture refers to the size of the lens opening, which controls the amount of light that enters the camera. It also affects the depth of field, or the range of sharpness in a photo. A low f-stop number (e.g., f/1.8) means a wide aperture, allowing more light and creating a shallow depth of field. A high f-stop number (e.g., f/16) results in a narrow aperture, letting in less light and producing a greater depth of field.

**ISO Sensitivity:** ISO measures the camera's sensitivity to light. A low ISO setting (e.g., ISO 100) is suitable for well-lit scenes and provides high image quality but requires more light. A high ISO setting (e.g., ISO 1600) makes the sensor more sensitive to light, making it suitable for low-light conditions but may introduce noise or grain into the image. Certainly, understanding your photography goals and the specific requirements of each genre is crucial when choosing a camera and lens. Here's a concise summary:

**Portraits:** Choose lenses with longer focal lengths (>85mm) and large apertures (e.g., f/1.4 or f/1.8) for beautiful background blur and subject emphasis.

**Wildlife:** Opt for zoom telephoto lenses or fixed prime telephoto lenses to capture distant subjects with clarity.

**Landscape:** Use wide-angle lenses like 24-70mm or 14-24mm to capture expansive scenes and foreground details.

**Professional Photography:** Consider wide maximum-aperture lenses (e.g., f/1.4, f/1.8, or f/2) for versatility in various lighting conditions and creative depth of field control.

Choosing the right camera and lens combination based on your photography goals will lead to better results. The Sony Alpha 1 is a high-end camera known for its excellent features and performance across different photography genres. However, the evolution of camera technology has led to various camera types for different purposes, aiding in preserving moments as we see them. However, AI advancements raise concerns about distinguishing reality from edited content, emphasizing the need to preserve authenticity.

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## 21. SMART FINANCIAL MOVES

Students these days often fall short of money when it is a great need. So, for such instances they need to be much more conscious and keep in mind that financial management is a crucial skill for every student to learn and master. This is definitely not a hard task when practiced efficiently. Some managing habits and financial knowledge that one can acquire being in teenage during their student phase will have

a significant impact on the financial well-being in future regardless of the profession they get into.

Here are some practical tips to understand and step towards building a strong financial foundation.

### Importance:

Understanding how to manage money is essential for making informed financial decisions. Budgeting is a fundamental aspect of financial management, allowing individuals to track their income and expenses. It serves as a powerful tool to prevent falling into debt traps, especially those created by online loan apps like Slice, MPocket, Fibe, MoneyView, SmartCoin and others. These apps can manipulate users into a cycle of insurmountable debts, making it crucial to avoid relying on them for loans. Instead, proper financial management techniques can help minimize the need for loans.

Saving for the future is another critical facet of financial management. Whether it's for a gadget, vehicle, trip, or higher education, starting to save early puts individuals in a better financial position over time. Additionally, having emergency funds is mandatory, as life is unpredictable, and unexpected expenses can arise at any moment. Setting aside a portion of income each month for emergencies provides financial security.

Financial literacy is vital for efficient financial management. It involves understanding financial concepts and making informed decisions. Online resources, courses, and workshops can be valuable tools for enhancing financial literacy, empowering individuals to make wise financial choices.

### Steps towards financial management:

Here are six key financial management tips:

**Create a Budget:** Keep track of your income and expenses, and allocate your resources wisely to avoid accumulating debt.

**Live Within Your Means:** Prioritize essential needs over desires and make conscious spending choices to avoid overspending and accumulating unnecessary debt.

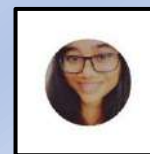
**Minimize Loans:** Explore alternatives to taking out loans and find ways to generate additional income to reduce reliance on borrowed funds.

**Build Good Credit:** Establish a positive credit history by using credit responsibly and paying bills on time.

**Save Regularly:** Set up a savings account and automate transfers to it, making it easier to save a portion of your income each month.



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21251A0448,3/4.





## 22. DIGITAL CURRENCY REVOLUTION: TRANSFORMING FINANCE IN A DIGITAL AGE

In recent years, digital currency has emerged as a groundbreaking force reshaping the financial landscape. Unlike traditional currencies, digital currencies exist solely in digital form, powered by blockchain technology. The most notable example is cryptocurrencies like Bitcoin and Ethereum, but central banks are also exploring digital versions of their fiat currencies.



One of the key advantages of digital currencies is their decentralization. Cryptocurrencies operate on decentralized networks, removing the need for intermediaries like banks. This has the potential to democratize finance, providing financial services to the unbanked and underbanked populations around the world. It also reduces the risk of censorship and interference by governments or financial institutions.

Moreover, digital currencies offer faster and cheaper cross-border transactions. Traditional international money transfers can be slow and costly due to multiple intermediaries and currency conversion fees. Cryptocurrencies can facilitate near-instantaneous cross-border transactions at a fraction of the cost.

However, digital currencies are not without challenges. Price volatility is a major concern, with cryptocurrencies experiencing rapid fluctuations. Regulatory uncertainty and security issues have also raised concerns about their mainstream adoption.

Central bank digital currencies (CBDCs) aim to address some of these concerns. These are digital versions of traditional fiat currencies issued and regulated by central banks. CBDCs offer the benefits of digital currency while maintaining the stability and backing of government-issued money.

The rise of digital currencies also raises questions about privacy and security. While cryptocurrencies offer pseudonymity, CBDCs could potentially provide governments with unprecedented insight into citizens' financial transactions. Striking a balance between privacy and regulation will be crucial in the digital currency era.

In conclusion, digital currency is revolutionizing the financial world. Whether through cryptocurrencies or central bank digital currencies, it promises greater financial inclusivity, efficiency, and security. However, challenges such as regulatory frameworks, privacy concerns, and price stability must be carefully addressed to ensure a smooth transition into this digital age of finance.

**P. SATHWIKA**  
21251A0450,3/4



## 23. DISCOVERING THE MAGIC OF ISRO

The most heard topic in the recent days is all about CHANDRAYAN 3. So, what exactly is it? What will it do after reaching the moon? How do I plan a career in ISRO? These may be the questions hovering in most of the minds these days. Isn't it interesting to know that the future generations would come all the way from moon for a vacation on earth? Let's take a look into it now.



The Indian Space Research Organisation is the national space agency of India. ISRO is primarily responsible for performing tasks related to space-based operations, international space cooperation and the development of related technologies. As the national space agency of India, ISRO's purpose is the pursuit of all space-based applications such as research, reconnaissance, and communications. It undertakes the design and development of space rockets and satellites and undertakes explores upper atmosphere and deep space exploration missions. Chandrayan 1,2 and 3 are the projects of ISRO so far.

Chandrayaan-3 is India's second attempt to soft-land on the Moon after the partial failure of Chandrayaan-2. The mission will only include a lander-rover set and will communicate with the orbiter from the previous mission.

ISRO became the first space agency to successfully land a spacecraft on the lunar south pole region, and only the fourth space agency ever to land on the Moon.

ISRO's mission objectives for the Chandrayaan-3 mission are:

- Engineering and implementing a lander to land safely and softly on the surface of the Moon.
- Conducting and observing experiments on the materials available on the lunar surface to better understand the composition of Moon.
- Observing and demonstrating the rover's driving capabilities on the Moon.

The main objective of ISRO is to explore the unexplored using Chandrayaan-3. It would study more about the minerals, composition and rocks on the lunar surface. India would be the first country to do so. Based on the images from the satellite ISRO would conclude about the availability of resources. As of now they have received dark images with some hint of hydrogen and oxygen molecules is indicating the presence of water.

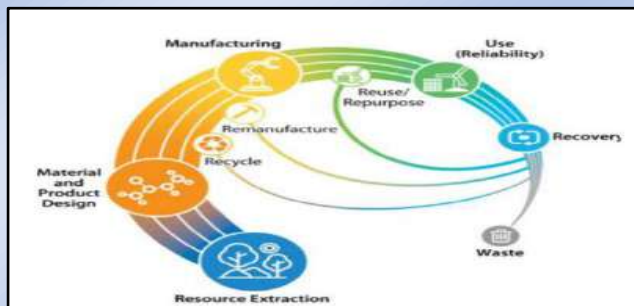
All of this seems interesting right? What if I tell you. You could actually be a part of this incredible mission? yes, you've read it right. You could be a part of this mission by pursuing a BE/BTech degree (in any dept) from any of the engineering colleges and appearing for the ICRB (ISRO centralised recruitment board) exam. After you have a CGPA of 7+ in engineering and cleared the ICRB exam you

will have to appear for an interview and if you get shortlisted you are a proud employee of ISRO now!! In few of the cases ISRO prefers students who have graduated from IITS, NITS, IIST and have done specialisation in related topics

**B. SREE MANASWINI**  
22251A04C9,2/4.



## 24. CIRCULAR ECONOMY: TURNING WASTE INTO RESOURCES



Waste is one of the biggest challenges faced by our society. If not handled correctly, waste pollutes our natural environment with devastating results. However, seems almost unavoidable that our society generates waste. The circular economy focusses on minimising waste and maximising the reuse, repair and recycling of materials to create a more sustainable .it aims to turn waste into valuable resources, reducing environmental impact and promoting long-term economic viability. To manage waste as a resource, instead of as a problem, the waste industry will have to become a key partner of business operating in the circular economy. This means a transition from the ‘collect and dispose method of waste and generating high quality waste streams for reuse and recovery. This maximises both the value and the volume of resources within the economy. A major part of the solution may lie in another global problem—the rapid accumulation of industrial waste, which is sometimes toxic. The machinery to implement these new processes must be easy to construct and widely available. The social benefits of alleviating both problems at once are incalculable; such a solution offers a win-win outcome in the areas of the “three E’s”—engineering, economics, and the environment. Unmanned control technology can be used to operate an underground metal mine. If environmental considerations are coupled with engineering processes, recyclable materials can be selected for use, while unusual or hazardous ones can be avoided, removed, or safely transferred to other feed-stocks probably reducing damage to the environment.

The challenges faced by human kind are enormous and unprecedented. The industrialized world can no longer rely

on its ability to draw new resources from the earth and the oceans. It is no longer safe to exploit these resources without regard to detrimental potentially disastrous effects such as climate change or catastrophic damage to water or food supplies. Traditional sources of energy are no longer environmentally acceptable. A radical new approach is usually required. Waste generation rates in lower income countries are forecast to more than double over the next 20 years as their level of economic development increases. In so far as the recoverable components of MSW are not recycled, the non-recycled fraction will represent a major depletion of finite natural resources. In the Middle East, a region with high organic fractions, there is low recyclables content, and a high portion of landfilling and open dumping for disposal, as shown in below figures. In fact, waste recovery/recycling rates are the lowest in the world in the Middle East. With the geopolitical issues in the region, waste management is not heavily regulated by municipalities, particularly in poorer countries. In countries with more wealth, access to inexpensive crude oil and petrochemical feedstocks make waste recovery and recycling technologies less economically attractive. Waste as an important bioenergy resource.

**LAVANGA DEVI**  
21251A0415,3/4



## 25. REVOLUTIONIZING INDUSTRIES: THE PROMISING LANDSCAPE OF ROBOTICS



In the realm of technological advancement, one field that has garnered remarkable attention and rapid development is robotics. Robotics, the interdisciplinary domain that combines engineering, computer science, and

artificial intelligence, has transformed industries across the globe. From manufacturing and healthcare to exploration and entertainment, the integration of robotics has opened doors to unprecedented possibilities. This article delves into the world of robotics, exploring its diverse applications, challenges, and the future it holds.

The journey of robotics dates back centuries, with early automatons and mechanical devices captivating human imagination. However, the modern era of robotics began in the mid-20th century with the advent of programmable computers. This marked the dawn of industrial robotics, where robots were employed in manufacturing processes to enhance efficiency and accuracy. The introduction of Computer Numerical Control (CNC) machines and robotic



arms revolutionized assembly lines, leading to higher production rates and improved product quality.

**Applications:**

**Manufacturing:** Robotics has improved production capacities, reduced costs, and enhanced safety in manufacturing.

**Healthcare:** Surgical robots enable precise and minimally invasive procedures, while exoskeletons aid patients with mobility impairments.

**Logistics and Warehousing:** Automated vehicles navigate warehouses, speeding up order fulfilment and reducing errors.

**Entertainment and Education:** Social robots serve as companions, educators, and sources of entertainment, enhancing learning experiences.

**FUTURE:**

**Collaborative Robotics:** Cobots will work alongside humans, enhancing productivity and safety while promoting partnerships.

**AI Integration:** AI-driven robots will adapt to dynamic environments, make real-time decisions, and learn, increasing autonomy and efficiency.

**Health-care Revolution:** Robots will advance personalized medicine and remote surgeries, improving patient care, even in remote areas.

**Education Transformation:** Robotics will offer immersive STEM learning experiences, helping students grasp complex concepts.

In conclusion, we can say that, the age of robotics is here, revolutionizing industries and our daily lives. Challenges like ethics and job displacement require responsible innovation. Balancing tech progress with human welfare is crucial. The future holds promise as robots enrich our lives and transform society in unforeseen ways.

G.K.N.R.I. TUSHARA  
22251A0409,2/4

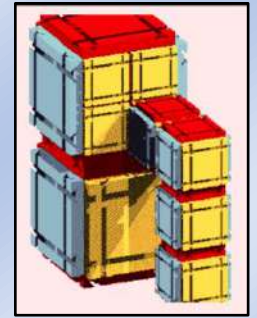


**26. AGI IN INDUSTRY:  
PIONEERING THE FUTURE OF  
AUTOMATION AND ROBOTICS**

AI excels in specific tasks, showing superhuman proficiency, while AGI aims to replicate human-like cognitive abilities, including learning, reasoning, and adaptability across various domains. AI has diverse applications, from image recognition to natural language processing, while AGI could revolutionize how machines interact with and understand the world. These two realms of machine intelligence differ fundamentally in scope and adaptability, with AI specializing and AGI seeking holistic, flexible intellect akin to human cognition.

The integration of Artificial General Intelligence (AGI) into industrial automation and robotics is a pivotal frontier in

technology. AGI's combination of cognitive abilities and mechanical precision is transforming manufacturing and logistics. AGI's capacity for learning, reasoning, and adaptation promises to enhance efficiency, adaptability, and innovation in these industries. This article explores how AGI is revolutionizing industrial processes, ushering in a new era of smarter, more agile, and highly efficient operations.



**Adaptive Automation:** AGI enables dynamic adjustments based on real-time data, fostering unparalleled flexibility in manufacturing.

**Human-Robot Synergy:** AGI empowers robots to collaborate with humans, enhancing productivity and safety.

**Cognitive Learning:** AGI allows robots to learn and reason like humans, handling complex tasks in real-time.

**Advanced Sensing and Perception:** AGI enhances robot perception for navigating complex environments.

**Predictive Maintenance:** AGI predicts maintenance needs, minimizing downtime and boosting efficiency.

**Customization at Scale:** AGI enables customized production without extensive reprogramming.

7. Logistics Optimization: AGI streamlines supply chain operations for cost-effective efficiency.

8. Quality Control: AGI performs precise inspections, ensuring high-quality products.

9. Innovation: AGI opens new frontiers beyond repetitive tasks, promoting creativity and adaptability.

10. Ethical Considerations: Responsible use of AGI in industrial automation, emphasizing safety, privacy, and accessibility.

In Conclusion, the integration of AGI into industrial automation and robotics heralds a new dawn in manufacturing, logistics, and beyond. With adaptability, intelligence, and autonomy at its core, AGI is set to redefine the boundaries of what is achievable in industrial processes. As we move forward, it is with the knowledge that this technological leap has the potential not only to enhance productivity and efficiency but to usher in a new era of innovation, collaboration, and progress. The future, it seems, has never been brighter.

K. NAYANA HARSHITA  
22251A0479,2/4.



**27. REIMAGINING ROBOTICS:  
THE FASCINATING WORLD OF  
FRACTAL ROBOTS**

Have you ever imagined a world where buildings rise from the ground in a matter of seconds, intricate medical

procedures are executed with unparalleled precision, and scientific experiments are conducted by objects that seemingly possess a life of their own? Welcome to the revolutionary realm of Fractal Robots—a marvel of innovation that promises to redefine the very essence of technology as we know it. As we continue, we'll embark on an awe-inspiring journey through the world of Fractal Robots, delving into the science, the potential, and the boundless possibilities that this transformative technology brings to our doorstep. So, fasten your seatbelts, for we are about to navigate uncharted territory—a realm where imagination meets reality, and objects come to life in ways we've only dreamt of.



Fractals, exhibit self-similarity throughout their structure. Fractal Robots, inspired by this concept, consist of cube-shaped bricks with embedded

electronics. They can reshape themselves, mimicking fractal properties. Designed for simplicity and mass production, these robots can use materials like metals and plastics for cost-effectiveness or eco-friendly options like ceramics and clays, making them accessible to various applications and regions, particularly in developing nations.

Robotic cubes consist of flat faceplates attached to cube-shaped frames, creating hollow cubes. These faceplates have special electrical contact pads for power and data transfer to nearby cubes. Small parts protrude at a 45-degree angle to interlock with neighbouring cubes, much like puzzle pieces. These contact pads can either be on the faceplates or on a separate pad.

Tiny components called "petals" are driven in and out of slots using a motor. They have tooth-like edges and fit into adjacent cubes through 45-degree slots, akin to puzzle pieces snapping into place. A gear wheel or a screw-like thread in the slot helps move the cubes, similar to turning a screw during assembly. Fractal Robots are controlled by microcontrollers, simplifying computer programming and ensuring compatibility between software and hardware. This fractal architecture also extends to the operating system, data structures, and devices, promoting seamless integration. The Fractal Operating System (Fractal O.S) uses a Fractal bus for efficient data transfer, with messages broadcasted to a local machine managing a group of cubes, each identified by a unique number, facilitating effective communication.

Imagine robots that can construct bridges of any size in record time. These marvels of engineering are crafted from simple cubes that transform their shape with pinpoint accuracy, all under the watchful guidance of a computer. They're bridge-building wizards, turning mundane construction into a mesmerizing display of speed and precision. But that's just the beginning. These shape-shifting robots are like superheroes in the world of firefighting. Picture them squeezing through the tiniest openings, even though they're larger-than-life machines. When chaos reigns and flames rage, they step in as saviours, turning impossible

scenarios into manageable challenges and it doesn't stop there. These robots are masters of entry, infiltrating buildings through minuscule entrances that would leave any human baffled. They're the rapid responders, equipped with lifesaving gear, ready to tackle emergencies head-on.

**SRI CHANDRAJA REDDY ALLALA**  
20251A0431,4/4



## **28. AI-POWERED FACIAL RECOGNITION: A GAME-CHANGER IN PREVENTING UNDERAGE DRIVING ACCIDENTS**

Every year, countless lives are affected by accidents caused by underage drivers, posing a significant threat to road safety. In the age of technological advancements, a groundbreaking solution is an AI-powered facial recognition system that aims to make our roads safer by allowing only eligible and licensed drivers behind the wheel. Accidents involving underage drivers have long been a grave concern in many countries. Inexperienced and often impulsive, these young drivers lack the judgment and skills necessary to navigate the complexities of the road safely. While there are legal age requirements and licensing processes in place, enforcing these regulations has proven to be a daunting challenge. One of the solutions can be resolved by using the power of artificial intelligence to address this pressing issue. A small camera can be installed inside the car, focused on the driver's face, and utilize advanced AI algorithms to analyse the driver's facial features. The AI algorithms are programmed to determine the driver's age accurately, ensuring that only individuals above the legal driving age are allowed to operate the vehicle. It also checks for a valid driver's license, allowing only those with the requisite documentation to unlock the car and drive.

The potential impact of this AI-powered facial recognition system on road safety is substantial. It effectively curtails underage driving, reducing the risk of accidents caused by inexperienced drivers. Additionally, it complements existing legal frameworks by providing an automated and foolproof method for verifying a driver's eligibility, making enforcement more effective. Fewer underage drivers on the road means fewer accidents, injuries, and fatalities, making our roads safer for everyone. This system not only enforces age and licensing regulations but also sends a clear message about responsible driving behaviour to young individuals. While the potential benefits of this technology are evident, it's essential to consider the privacy and ethical implications. Striking the right balance between safety and personal privacy is a challenge that must be addressed thoughtfully.



The system must ensure that facial data is stored securely, and access to it is strictly controlled to prevent misuse. In conclusion, the AI-powered facial recognition system designed to prevent underage driving accidents is a remarkable example of how technology can be harnessed for the greater good. By combining advanced facial analysis algorithms with stringent age and license verification, it offers a promising solution to a persistent road safety problem. As technology continues to evolve, so does our ability to address longstanding challenges and create a safer, more responsible future on the road.

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21251A0463,3/4.



## 29. ARTIFICIAL INTELLIGENCE IN BANKING



Artificial intelligence (AI) has been making significant advancements in various industries, including the banking sector. AI, which is defined as the intelligence of machines and software with

human-like smartness, has been applied to banking to expose risks, enhance customer services. For banks, data is essential to almost all business lines, from traditional deposit taking and lending to investment banking and asset management. Autonomous data management without human involvement therefore offers great opportunities for banks to improve speed, accuracy and efficiency.

- AI is utilized for real-time fraud prevention in online banking, where credit card fraud has surged with the growth of online and mobile payments. AI algorithms assess the credibility of client credit card transactions in real-time, comparing them to historical data and blocking risky transactions.
- KYC (Know Your Customer) processes employ AI to verify client identities. AI algorithms cross-reference client documents with online information, detecting inconsistencies and triggering detailed checks by bank staff.
- Banks are exploring AI in chatbots, digital assistants that engage with clients via text or voice, enhancing customer service without human involvement.
- Robo-advisors are emerging as true AI solutions, automating asset management by analysing market data, customer preferences, and risk tolerance to create personalized investment portfolios.
- AI-driven systems aid banks in regulatory compliance, monitoring real-time data to detect potential violations and flag suspicious activities, minimizing penalties and reputational risks.

### Challenges:

The adoption of AI in banking faces challenges like data privacy, security, talent shortage, and ethical concerns. Despite these hurdles, the future looks promising as AI evolves. Banks are likely to harness its increasing sophistication for competitive edge, improved customer experiences, and adaptability in the dynamic financial landscape.



Artificial intelligence has brought a seismic shift to the banking sector, reshaping customer experiences, bolstering security measures, optimizing processes, and enhancing risk management. Embracing AI-driven solutions will empower banks to thrive in an increasingly digital and data-centric world. As the technology evolves and challenges are addressed, Alis poised to revolutionize banking, offering unparalleled opportunities for growth, innovation and sustainable success.

**MATLA VARSHITHA REDDY**  
21251A04E6,3/4.



## 30. ARTIFICIAL INTELLIGENCE: IT'S IMPACTS

The Artificial Intelligence (AI) has become an integral part of our daily lives, revolutionizing industries and reshaping the way we interact with technology. This rapidly advancing field of computer science holds the promise of making our lives more efficient, convenient, and interconnected, but it also raises important questions and challenges for society.

**AI in Everyday Life:** AI is woven into daily life through voice assistants, recommendation algorithms, and applications in healthcare and transportation.

**The Future of Work:** AI's role in automation raises questions about job displacement, necessitating workforce retraining and upskilling.

**Privacy and Security:** AI's data processing capabilities raise privacy and security concerns, emphasizing the importance of safeguarding personal data.

**Ethical AI Development:** Ethical principles such as transparency, fairness, accountability, and inclusivity must guide AI development for the benefit of society.

**AI in Healthcare:** AI aids early disease detection, precise diagnoses through medical imaging, and provides continuous patient support.

**Education and AI:** Adaptive learning platforms and administrative automation are transforming education, though concerns about privacy and job displacement persist.

**AI and Autonomous Vehicles:** Self-driving cars hold potential for reducing accidents but face ethical and regulatory challenges.

**AI and Environmental Sustainability:** AI contributes to environmental conservation through predictive modelling and smart grid technologies.

**AI and Financial Services:** AI combats fraud, enhances customer service, and offers robo-advisory services while addressing data security and bias challenges.

**AI and Entertainment:** AI personalizes content recommendations and generates creative content, transforming the entertainment industry.

In summary, AI's transformative potential comes with ethical, regulatory, and societal challenges that require collective efforts to harness its benefits responsibly. Artificial Intelligence is undoubtedly transforming our world. It has the potential to solve complex problems, increase efficiency, and improve our quality of life. However, it also comes with challenges related to ethics, employment, and privacy. Addressing these challenges requires a collaborative effort from governments, businesses, researchers, and society as a whole to ensure that AI remains a force for good in our ever-changing world. Artificial Intelligence is a multifaceted and rapidly evolving field with profound implications for society. Its impact spans various sectors, from healthcare and education to transportation and the environment. While it offers tremendous benefits, addressing ethical, regulatory, and societal challenges remains a priority to harness its potential responsibly and equitably.

**N. BHAVYA SREE**  
22251A0423,2/4.



### 31. VOYAGE TO THE MOON: EXPLORING CHANDRAYAAN-3

The **Chandrayaan-3** mission, undertaken by the Indian Space Research Organisation (ISRO), represents a remarkable leap in India's space exploration journey. Building upon the lessons learned from the Chandrayaan-2 mission, which faced challenges during its landing phase, Chandrayaan-3 demonstrates ISRO's dedication to technical excellence and their commitment to overcoming hurdles in lunar exploration. India's journey was first to begin with Chandrayaan-1, the country's first lunar mission which was launched on October 22<sup>nd</sup> 2008 .it was carried into space by India's polar satellite vehicle PSLV on its c-11mission, Chandrayaan-1 orbited the moon 312 days, it also carried by 11 scientific instruments – five Indian and six international. It also made new discoveries confirming presence of water on the moon and detecting water ice in the north Polar region, on the success of Chandrayaan-1.

India embarked on Chandrayaan-2 in 2019 aiming to further scientific understanding of moon. Chandrayaan-2, launched in July 2019, comprised three crucial components: the Orbiter, the Vikram lander, and the Pragyan rover. While the Orbiter successfully entered lunar orbit and continues to

provide valuable scientific data, however despite the meticulous planning Chandrayaan-2 faced an unexpected setback during its landing attempt .The Vikram lander deviated from its intended trajectory and contact with it was lost before the touch down, When it is around 2km above the moon resulting to unsuccessful landing due to failure due to some software glitch ,propulsion system causing the lander and the robot to crash on the moon's surface .

Chandrayaan-3 comprises of three main components: Propulsion Module, Lander, and Rover.

**Propulsion Module:** Transports Lander and Rover to lunar orbit, remains in orbit for data collection and relay.

**Lander:** Detaches for a soft landing on the moon's surface.

**Rover's Exploration:** After landing, the Rover collects data and analyses moon composition.

#### **Chandrayaan Impact on Electrical Communication Engineering:**

Chandrayaan's impact on electrical communication engineering includes advancements in satellite communication tech, deep space communication, remote sensing data transfer, satellite navigation, and complex interplanetary communication systems development, benefiting various applications and future missions.

In conclusion, ISRO's Chandrayaan missions have advanced various aspects of electrical communication engineering, benefiting lunar exploration and inspiring the global space community. Chandrayaan-3 underscores India's dedication to lunar exploration and serves as a beacon of inspiration for space endeavours worldwide.

**N. RISHIKA**  
21251A0420,3/4



### 32. QUANTUM COMPUTERS

The term quantum comes from the study of quantum mechanics, A lot of the work in the field describes the behaviour and significance of small particles like atoms, electrons, and photons, and quantum computers are machines that work based on quantum principles to store data and perform calculations more than ever. Quantum computers encode information in qubits or quantum bits.

A Quantum bit is made out of a quantum system, like an electron or a photon. Unlike a classical bit, a quantum bit can also exist in superposition states, be subjected to incompatible measurements, and even be entangled with other quantum bits. Superposition allows quantum objects to simultaneously exist in more than one state or location. This means that an object can be in two states at one time while remaining a single object. Entanglement is when multiple objects—such as a pair of electrons or photons—share a single quantum state. It is the state where two systems are so strongly correlated that gaining information about one system will give immediate information about the other no matter how far apart these systems are. This



phenomenon baffled scientists like Einstein who called it “a spooky action at a distance” because it violates the rule saying that no information can be transmitted faster than the speed of light. A quantum computer consists of three main parts:

**A part that holds qubits:** It is kept at a freezing temperature to enhance coherence and minimize interface. In other quantum computers, the part that holds the qubits is kept in a vacuum chamber that reduces vibrations and helps to balance the qubits.

**A part that transfers signals to the qubits:** It transfers signals to the qubits and can use microwaves, lasers, and voltage to send those signals.

A classical computer that can run programs and give instructions.

To ensure the stability and proper functioning of light-based qubits, they must be stored at extremely low temperatures near absolute zero, requiring significant power and resources. Memory chips containing thousands of atoms emitting these qubits face challenges when exposed to heat. Increased atomic movement and collisions lead to the emission of dissimilar photons. To address this issue, a protective paraffin coating is applied inside memory chips, softening atomic collisions and ensuring emitted photons are identical and stable. Special filters are used to extract only identical photons. While qubits of light are produced at a slow rate, cooled systems can generate millions in the same time frame.

Complex problems involve numerous interacting variables, like modelling molecular behaviour or detecting fraud patterns. Quantum computers, which use quantum bits (qubits), offer powerful solutions for these problems. Quantum computing excels in big data analysis, enabling near-instant processing of large, mixed datasets. This impacts various fields, from finance and robotics to weather forecasting. Financial predictions can react faster to market changes, AI and robots respond swiftly to environmental shifts, and weather forecasts become more accurate by analysing extensive meteorological data. Quantum computing transforms industries reliant on big data analysis.

P. CHETHANA LAHARI  
21251A0471,3/4



### 33. TACHYON: PARTICLE WITH SPEED GREATER THAN THAT OF LIGHT

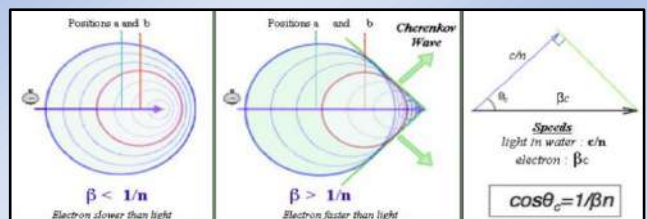
Tachyons are hypothetical particles that move faster than light, exhibiting the unusual property of having their energy decrease as their speed increases. It would require an infinite amount of energy to slow down a tachyon to the speed of light. The term "tachyon" was coined by Gerald Feinberg in 1967, and these particles are a fascinating consequence of Einstein's theory of special relativity. Unlike ordinary particles (bradyons) that speed up with added energy,

tachyons accelerate as energy is taken away. Due to their superluminal speed, detecting tachyons approaching is impossible.

Tachyons are particles that move faster than the speed of light in a given medium, with their speed increasing as energy decreases. They form a hyperbolic trajectory in space-time and annihilate when they reach infinite speed at the same location. Even neutral tachyons lose energy through gravitational Cherenkov radiation, interacting with other particles and emitting Cherenkov radiation into them. Tachyons can have various properties, including spin 0 or "continuous spin," and obey either Bose or Fermi statistics. They are associated with a tachyon field and virtual tachyon particles.

Despite their superluminal speed, tachyons are proposed to have mass energy and some gravitational effect. Sensitive detectors could potentially detect this effect. While the speed of light in a vacuum is an ultimate speed limit, particles have been observed traveling faster than light in specific mediums, emitting Cherenkov radiation in the process. Detecting tachyons in space may involve measuring Cherenkov radiation. Tachyons could also appear as momentum transfer resonances in particle collisions, depending on their properties.

Cherenkov radiation occurs when a charged particle moves through a dielectric material faster than the material can react to changes in its electric fields. This phenomenon results in the emission of Cherenkov light, which carries away kinetic energy from the moving particle. The dissipative force responsible for this process "grabs" at the electric fields, causing pieces of those fields to break off as



electromagnetic radiation, similar to cyclotron radiation.

Cherenkov radiation is a “bow shock” caused when particles move faster than light in some medium. It’s analogous to the bow wave of a boat or a sonic boom. Nothing can move faster than light in a vacuum but in water the speed of light is only 3/4 of its speed in a vacuum and particles can easily exceed that speed. That’s what makes the blue glow around water-cooled nuclear reactors. Extremely high energy particles can produce Cherenkov radiation in air. This effect is used for studying high energy cosmic rays.

Hence tachyons produce Cherenkov radiation in a water. It can be achieved by using Water Cherenkov detector, which detects radiation usually by photomultiplier tubes (PMTs), and the cone of emission reconstructed. Through this study the existence of tachyons can be predicted effectively. Later, the laws that govern gravitational field shall be adapted to the exceptional case of tachyons which require infinite energy.

V.RUTHWIKI  
22251A04C8,2/4.

## 34. PERSONALITY DEVELOPMENT

Personal Development is a process of improving oneself mentally, emotionally and physically. It involves setting goals, acquiring new skills, self-reflection, cultivating positive habits, and enhancing self-awareness. It empowers individuals to reach their full potentials, improve their well-being and lead a more fulfilling life.

### Setting Goals:

Mark Murphy the founder and CEO of LeadershipIQ.com and also the author of book “HARD GOALS: The Secret to Getting from Where You are to Where You Want to Be”, combines the latest research in psychology and brain science on goal-setting as well as the law of attraction to help fine-tune the process. A HARD Goal is an achieved goal, tells us to put our present cost into the future and our future benefits into the present

What this really means is don't put off until tomorrow What you could do today. We tend to value things in the present moment much more than we value things in the future.

### Acquiring New Skills:

Acquiring new skills can help you continue to grow professionally and expand your career opportunities. For example, choosing a skill to learn, making time to learn, learning the fundamentals, choose the tools to use, create a curriculum, share your goals, setting deadline's etc.

### Self -Reflection:

Self-Reflection is a powerful tool that can help you achieve growth and improve your overall well-being. It helps you gain a deeper understanding of yourself, your emotions and your experiences.

**MAHESHWARI THOTA**  
22251A0462,2/4.



## 35. PEER PRESSURE

Peer pressure is the direct or indirect influence from members on an individual. It can give both positive and negative impacts on the individuals. Everyone in this world is affected by peer pressure. Peer pressure can change a person's behaviour, attitude and way of thinking. Everyone has different upbringing. Parents play vital role in shaping their children. As a person grows older, they learn different aspects of life from their peers. Peers can affect you in a lot of ways. They might try to pressurise you into doing something you know is wrong. But peer pressure does not always have negative impacts, it has some positive impacts too. Examples of negative peer pressure include: acting aggressively, bullying others, dressing in certain way, getting attracted by bad habits etc. Examples of positive impacts of peer pressure include motivating each other in improving academic performances, respecting each other, supporting others etc.

## How can you escape the peer pressure?

Here are some tips for overcoming peer pressure:

- Stay true to your values and know what is important to you. Stay confident of your choices and prioritise your needs. Your liking priority should always be liking yourself first.
- Talk to the person who is pressurising you, let them know how you are feeling and ask them to stop.
- Make friends with people having similar values and beliefs as you, so that you can respect each other.
- Discover some ways to lower your anxiety surrounding peer pressure. For example, write down your worries in a book or practice simple relaxation and mindfulness.

**B. HARSHITHA**  
22251A04E1,2/4.



## 36. PRIORITIZING MENTAL HEALTH IN EDUCATION

In the world of education, where academic achievement has long held the spotlight, a silent crisis has been brewing. This crisis touches not only students but also educators and often remains hidden beneath the surface. It is the escalating prevalence of mental health issues in educational institutions. Stress, anxiety, depression, and other mental health challenges have become alarmingly common, demanding our acknowledgment of mental health as a fundamental priority in education.

**The Role of Educators:** Educators are on the frontlines of this crisis. Teachers, school counsellors, and administrators often spend more time with students than anyone else outside of their families. This unique position places them in a pivotal role when it comes to recognizing and addressing mental health challenges. Teaching transcends the mere dissemination of knowledge; it involves nurturing the whole student. Educators must create safe, empathetic, and inclusive learning environments where students feel comfortable discussing their mental health concerns. This entails expanding their roles to become advocates for student well-being.

**Breaking the Stigma:** One of the most formidable barriers to addressing mental health in education is the stigma that continues to surround it. Students often fear judgment or discrimination if they open up about their struggles. The stigma of being labelled 'different' or 'weak' often prevents many from seeking help.

**Resources and Support:** To effectively address mental health in education, schools must provide adequate resources and support. Trained counsellors should be readily available for students, offering guidance, support, and intervention when needed. Furthermore, schools should conduct workshops and seminars on stress management, emotional intelligence, and other topics related to mental



health. Educators themselves require support systems to manage their well-being. The demands of teaching can be physically and emotionally taxing, often leading to high levels of stress and burnout. School administrations should prioritize the mental health of their staff, offering resources such as counselling services, professional development on well-being, and strategies for maintaining a healthy work-life balance.

**Balancing Academics and Well-being:** While academic achievement is undoubtedly important, striking a balance between rigorous academics and student well-being is essential. The intense focus on standardized testing and academic success has created a high-pressure environment in many educational systems.

In Conclusion, in our relentless pursuit of academic excellence, we must not neglect the well-being of students and educators. Education goes beyond the acquisition of knowledge; it encompasses the holistic development of individuals who are emotionally resilient, socially adept, and mentally healthy. Let us heed this imperative and work collectively to ensure that mental health is not just an afterthought but a fundamental cornerstone of our educational system.

**K. PREETHI CHANDRA**  
22251A0442,2/4



### 37. PHYSICAL AND MENTAL FITNESS

We can say that our body is a very interesting and complex thing. Our body is a very complex and interesting thing. If we provide it with positive energy, it will act positively and vice versa. Therefore, it is very important to keep our body fit.

when it comes to fitness, we have two types one is physical fitness and the other one is mental fitness.

Physical fitness is a state of health and well-being. More specifically speaking the ability to perform daily activities without any difficulty. Physical fitness is generally achieved through proper nutrition, physical exercise and sufficient rest. Physical-exercises are again of two types aerobic and anaerobic.

Aerobic exercise improves cardio-respiratory fitness and increases stamina. It involves movement that increases the heart rate to improve the body's oxygen consumption. This form of exercise is an important part for everyone irrespective of the persons occupation. Examples of aerobic exercise include jogging, walking, treadmill, cycling etc.

Anaerobic exercise features high-intensity movements performed in a short period of time. It is a fast, high-intensity exercise that does not require the body to utilize oxygen to produce energy. Anaerobic exercises include sprinting etc.

As the famous quote goes by like this "HEALTH IS WEALTH", being physically active can improve your brain health, reduce the risk of disease, strengthen bones and muscles and improve your ability to do everyday activities. We can be active only when we are feeling healthy. People who sit less and do any amount of moderate-to-vigorous physical activity gain some health benefits.



These days we hear a lot about mental health. Mental fitness can be defined as having and maintaining a state of well-being and cultivating awareness of how we think, behave and feel. Just as physical fitness provides us with an increased ability to respond to life in all its richness, mental fitness helps in the same way. It provides us more space to choose how to respond to a situation. Whether that situation is a expected or unexpected. As a result, we are less likely to sustain emotional and relational injury. Developing the skills for better mental fitness can benefit you and everyone around you.

Mental fitness gives you the ability to pause and respond in the way you would like, in the moment, rather than regretting afterwards. Mental health is all about our brain. Meditation is one of the best ways to maintain our mental health. Sit with your eyes closed or softly focused for five minutes and scan your body. Place your attention in each body part starting at the top of your head and working your way down to your toes. Wherever you notice tension, focus and breath consciously until the tension is released. Do this daily to increase awareness of what's going on in your body. Remember, in meditation, the aim is not to completely stop thought. Rather simply notice when you have been distracted and gently bring your attention back to the focal point, with a smile. When you do that, you are developing mental fitness.

In our life both physical and mental health play an important role. It is very necessary for us to maintain both. Hope we maintain our health.

**K. SREE SOWMYA**  
22251A04H3,2/4.



### 38. ANXIETY: AN ISSUE TO WORRY ABOUT



Anxiety is a feeling and emotion of excessive and prolonged worry, a sense of dread and generalized tension. Fear and anxiety are similar emotions but have important differences. While

fear is based on a specific threat and is relatively short,

anxiety has no definite basis and often prolonged. We all experience anxiety at some level. Students feel anxious when taking an exam. You may feel apprehensive about going out on a blind date. Many people are scared of delivering a speech. Many situations in everyday life evoke anxiety. This means that anxiety is a normal occurrence and is part of a human being's strategy to cope with life.

The individual loses control and feels overwhelmed with anxiety to such extent as losing his or her job and developing relationship problems. Anxiety is caused by physical and psychological factors. Medical conditions such as heart problems, lung diseases and thyroid conditions can cause anxiety. On the other hand, anxiety can be caused by stressful situations, traumatic experience and learned behaviour. There are several different anxiety disorders, which can present with different symptoms. Some of them include restlessness, uncontrollable feelings of worry, increased irritability, difficulty concentrating, sleep difficulties.

There are studies that suggest stress and anxiety in students can keep them on track with schoolwork. But if the stress is not taken in a positive attitude, it can be detrimental. Researchers have classified stress into physiological, social, and psychological types. The symptoms of these stresses are also classified into physical, emotional, and mental.

Teenage depression or tension experienced by students growing up further increase academic pressure. If they fail to adapt to the transition and change, teenagers start suffering from anxiety, developing negative personal traits, and having attention problems. Besides, it is also noted that over-scheduling a student's life can put them under stress. Anxiety reduction and time management, together with leisure activities, may be helpful approaches for reducing academic stress among college students.

Education is one of humanity's most fundamental needs, as it is responsible for advancing our civilization. It is difficult to put a price tag on education. The education system has become an endless stream of papers, assignments, exams, midterms, etc. This turns into a never-ending flow of information that needs to be processed.

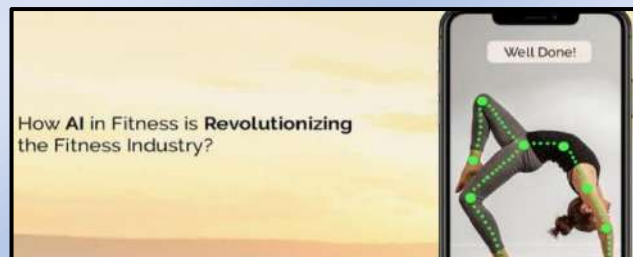
Emotional symptoms include being short-tempered, feeling dejected, restless, intimidated, and nervous. These are factors that inhabit or make it difficult for a student to work with others. Mental symptoms of stress are expressed as absent-mindedness, loss of concentration, poor judgement, incompetence, uncertainty, and negative self-talk.

Several studies have found a general pattern of time when students report experiencing academic stress each semester. The peak source of academic stress result from taking and studying for exams, grade competition, and when there is an extensive syllabus to cover in a small amount of time.

**VARSHINI BOGHA**  
22251A04G4,2/4



## 39. REVOLUTIONIZING FITNESS: THE POWER OF AI-ENABLED WORKOUT ASSISTANT



In recent years, a remarkable transformation has taken place in the world of fitness, thanks to the introduction of AI-enabled workout assistants. These innovative tools have seamlessly integrated artificial intelligence (AI) into our fitness routines, changing the way we approach our health and wellness.

### Embracing Accessibility and Convenience

One of the most notable advantages of AI-powered workout assistants is their accessibility. These intelligent companions are available whenever you need them, allowing you to exercise on your own terms. Say goodbye to rigid schedules and hello to a more flexible approach to fitness.

### Tailored Guidance for Every Individual

These workout assistants are not one-size-fits-all. They consider your unique preferences, fitness levels, and goals. Through smart algorithms, they create customized workout plans designed just for you. This personalized approach ensures that your fitness journey is tailored to your specific needs and aspirations.

### Motivation at Your Fingertips

Staying motivated on your fitness journey can be a challenge, but with AI-enabled workout assistants, you have a constant source of encouragement. These assistants provide real-time feedback and positive reinforcement, helping you stay on track and achieve your goals. Some even incorporate fun challenges and rewards to make the process engaging and enjoyable.

### Putting Safety First

Safety is a paramount concern in any fitness regimen, and AI assistants are designed with this in mind. They offer guidance on proper form during exercises, reducing the risk of injuries. Additionally, they monitor vital signs and movements in real-time, providing an extra layer of security during your workouts.

### Tracking Progress Made Easy

Keeping track of your progress is crucial for reaching your fitness goals. AI-enabled workout assistants do the heavy lifting for you, monitoring key metrics like heart rate and calories burned. They also help you set achievable goals and provide visual representations of your progress, keeping you motivated and empowered.

### The Future of Fitness

As this technology continues to evolve, exciting possibilities emerge. However, it's important to consider ethical and privacy concerns. Safeguarding personal information is of utmost importance. Additionally, these



assistants have the potential to integrate with healthcare systems, potentially aiding in rehabilitation, managing chronic conditions, and promoting overall well-being.

In conclusion, AI-enabled workout assistants are a game-changer in the world of fitness. They make exercise accessible, engaging, and tailored to individual needs. By prioritizing safety and motivation, they empower individuals to take charge of their health and well-being. As this technology advances, it's important to embrace it responsibly, ensuring it benefits us all in the long run.

**K.SAI LALITHA DEVI**  
22251A0415,2/4.



## 40. SKY IS NOT THE LIMIT CHANDRAYAAN-3: UNVEILING THE MOON'S SECRETS

In the vast cosmos that stretches beyond our Earthly abode, there exists a celestial neighbour that has fascinated humanity for eons—the Moon. This celestial body, with its silvery glow and enigmatic craters, has been the subject of myth, wonder, and scientific exploration. Among the many pioneers in lunar exploration, India has marked its name with a mission of resilience and



ambition—Chandrayaan-3.

Chandrayaan-3, India's lunar endeavour, symbolizes human ambition and the pursuit of knowledge. It showcases the potential of science and technology. It represents the dreams of daring scientists and engineers, echoing a nation's belief in their transformative power. Chandrayaan-3 teaches us that despite setbacks, the human spirit endures. Failure is not final; it's a pathway to future achievements.

Chandrayaan-3 is more than a mission; it's a testament to human curiosity, resilience, and ambition. It symbolizes the triumph of science and determination over the challenges of the cosmos. It reminds us that, as a species, we are bound by our insatiable curiosity and our collective dream of reaching for the stars. As we look to the future, let us embrace Chandrayaan-3 as a source of inspiration. It teaches us that setbacks are but opportunities for greater achievements, that the pursuit of knowledge is a noble endeavour, and that our dreams of exploring the cosmos are limited only by the extent of our imagination. In the emotional tapestry of Chandrayaan-3, we find threads of hope, pride, resilience, and ambition woven together. It is a journey that transcends space and time, touching the hearts of all who gaze upon the Moon and dream of the wonders that lie beyond. Chandrayaan-3, with its emotional depth,

represents the spirit of human exploration and the enduring legacy of those who dare to reach for the stars.

Chandrayaan-3 embodies human curiosity, resilience, and ambition, symbolizing the triumph of science and determination over cosmic challenges. It inspires us to embrace setbacks as opportunities for greater achievements, to pursue knowledge nobly, and to dream beyond the cosmos. This mission weaves threads of hope, pride, resilience, and ambition, transcending space and time, touching the hearts of all who dream of exploring the wonders beyond our Moon. Chandrayaan-3 represents the enduring spirit of human exploration and the legacy of those who reach for the stars.

Chandrayaan-3 is not just a mission to the Moon; it is a symbol of human aspiration and the relentless pursuit of knowledge. It is a testament to the idea that when we dream big, when we push the boundaries of what is possible, there are no limits to what we can achieve. It is an inspiration for all of us to reach for the stars, to overcome challenges with resilience, and to work together to unravel the mysteries of the cosmos. As we look to the future, may Chandrayaan-3 serve as a beacon of hope and inspiration, lighting the way for generations of explorers to come. Let us continue to dream, to explore, and to push the boundaries of what is possible, for in doing so, we not only expand our horizons but also enrich the human spirit

**V. NIKITHA**  
22251A04C5,2/4.



## 41. INDIA: TO THE SUN WE GO



“After the success of Chandrayaan-3, India continues its space journey. Congratulations to our scientists and engineers at @isro for the successful launch of India’s first Solar Mission, Aditya -L1. Our tireless scientific efforts will continue in order to develop better understanding of the Universe for the welfare of entire humanity,” Prime Minister Narendra Modi posted on X after the successful launch.

Following the success of Chandrayaan-3, ISRO initiated a mission to study the Sun. Its main objectives include observing the Sun's chromosphere and corona dynamics, studying heating processes, plasma physics, coronal mass ejections, magnetic fields, flare exchanges, monitoring the particle environment, understanding the processes leading to solar eruptions in multiple layers

below the corona, exploring drivers for space weather, and investigating the origin, composition, and dynamics of solar wind. This mission holds significant promise for advancing our understanding of the Sun's behaviour and its impact on space weather.

Aditya, originally conceived in 2008 by the Advisory Committee for Space Sciences (ADCOS) as a small satellite for solar corona study, has evolved into a comprehensive solar and space environment observatory. Initially, it was envisioned as a 400 kg satellite in Low Earth Orbit (800 km) with a coronagraph. However, its scope expanded, leading to the mission being renamed "Aditya-L1." As of July 2019, the mission had an allocated budget of ₹378 crores, excluding launch costs.

Aditya-L1, meaning "Sun" in Sanskrit, is a coronagraphic spacecraft developed by ISRO and various Indian research institutes. It will be positioned approximately 1.5 million km from Earth at the L1 Lagrange point, providing continuous solar observation without eclipses. With seven payloads onboard, it will study the Sun's photosphere, chromosphere, and corona, using electromagnetic and particle detectors.

This pioneering mission aims to unravel mysteries related to coronal heating, coronal mass ejections, pre-flare and flare activities, space weather dynamics, and the propagation of particles and fields. Placing India at the forefront of space exploration, Aditya-L1 signifies the nation's commitment to advancing our understanding of the Sun and its impact on the space environment.

In embarking on this ambitious journey, India joins the ranks of leading nations in space exploration, poised to unlock the secrets of our universe. JAI HIND!

**THANISHKA SAMALA**  
22251A04C0,2/4.



## 42. EDUCATION

Education is the only thing that have no disadvantages while getting education is the most powerful weapon to change the world. Education is the word that teachers a person to leave life it is the basis of human life the first school of any child in his family and mother is a first teacher to him. And second teacher is the teachers, teachers are a unique gift from God teachers explains in a proper way that how to read how to write and how to gain the knowledge they will help to identify a student's strength and work with them to develop it.

Teacher teaches students how to behave with elders how to be with friends the teach good habits teach education made gives some importance that can change your life students gain knowledge skills by education, education is a passport for the future it brings every student to the bright future. Education bright future gives bright future for the people education is most important thing in your life it improves knowledge and develops the personality it brings a great change in our life it is responsible for the overall

development of a person. By the education people can gain the knowledge as always know that if people want the jobs, I need to settle in the career they don't get is the jobs they work hard for that now a days by corona effect the education got distracted. But now even though there is chrono or not we can able to take classes per students to educate by taking online classes it can help to increase their economic stability. It is the Important for the development of a person's knowledge and skills it facilitates quality learning for people throughout the life. As a kid every child dream of being a doctor lawyer engineering actor sports person and these dreams can come true through education.

**A. SUSHRITHA**  
22251A04G3, 2/4.



## 43. KILL POLLUTION OR IT WILL KILL YOU

People should understand the importance of environment they live in and respect the one given by God to live a simple life on the earth (the only known planet having life). Various types of pollution such as water pollution, soil or land pollution, air pollution, and sound or noise pollution, all are very harmful to the health of human beings and animals. People have been used to of technological advancement in their lives and forgot about all the existing problems because of that. Use of various fertilizers and other chemicals in the agriculture for many years in order to get better and healthy crops has created serious problem to the humanity. Increasing number of vehicles in the cities is another main cause of air pollution. Diesel vehicles are more dangerous than the petrol vehicles as they emit more carbon dioxide and carbon monoxide, both are very harmful to the health and atmosphere. My dear friends, it is very necessary for the common public to be aware of the bad effects of pollution and run in the direction against pollution to reduce its effects. We should plant more green plants in the surrounding areas and sides of the roads in order to maintain the natural equilibrium in the environment.

Now-a-days, environment is not peaceful because of the increasing noise level through the transport, sound systems, electronic devices, etc. Such voices are causing noise pollution and very bad to the natural stamina of our ears. Excess and unbearable noise of vehicles, loud speakers, etc., can cause ear problems and even permanent deafness especially in older people and kids. Man-made chemicals from the industries and factories such as hydrocarbons, solvents, heavy metals, etc., get mixed into the soil when people use herbicides, pesticides, fertilizers, etc., or through the spill or underground leakage of the chemicals. Such contaminants in the form of solid, liquid or gas are causing soil or land pollution which is contaminating the whole earth. Such contaminants are also causing water and air



pollution as they get mixed to the underneath water supplies and some chemicals produce harmful vapours respectively. We have been surrounded by the thick cover of the pollution from all around means upside, downside, and both sides. We are living in pollution but the most surprising thing is that some people even do not aware of it. Big and developed countries are highly responsible to this increased level of pollution all around the world. This is the very challenging issue of this planet which needs to be solved on urgent basis. It cannot be solved by the effort one or two countries, however; it can only be solved if all the countries do hard and strict effort from various aspects regarding this issue.

We as humans should take important steps for a better future. A lot of innocent lives are put in danger because of pollution so we should take part in an initiative to fight and control this problem. Together we can control pollution. Our respiratory system is damaged daily because we take carbon and dust particles through our noses because of environmental pollution. These are brought on by a large number of industrial and manufacturing facilities through the burning of fossil fuels and carbon dioxide from vehicle combustion.

Environmental pollution is also a result of climate change. Additionally, it impacts the ecosystem's biological and physical elements. Climate changes such as ozone depletion, greenhouse gases, and global warming are causes of environmental pollution. Moreover, they may have dangerous effects on future generations. The unpredictable extremes of cold and heat impact the earth's natural system. Our current environment is not suitable for breathing fresh air, drinking fresh water, growing healthy crops, or sleeping in a peaceful environment. We have to bear all that due to our negligence and carelessness. For real physical and psychological comfort, we have to continuously strive for a naturally fresh environment. We need to get control over this demon and protect the lives of the inhabitants by planting more trees, managing wastes from industries and factories, reducing heavy vehicle use, and taking other effective measures.

**BHAVYA DEEPIKA**  
22251A04B8,2/4



## 44. MUSIC MAKES A GREAT MAGIC

Music has been derived from the old French word musique. For any culture, music is an essential part. The northern part of India is famous for Hindustani music and the southern part of India is famous for Carnatic Music. Music is a pleasant sound which is a combination of melodies and harmony. Music is a universal language and can be understandable by everyone in the world. Music is something that saves us from being boredom and soothes you in every moment.

Music has a special power to change the mode of a person. Sometimes music speaks out our feelings. Music is not just which is composed by us but it exists in nature which includes sounds of waterfalls shipping of birds etc. It is a power to heal the emotions of a it is a kind of meditation.

Music takes us into a pleasant world where we can enjoy ourselves. India is a country of diversity so we have numerous styles of it. some of them are classical, pop, folk, rap etc. Music often plays and important role in social activities, religious rituals, celebrations and cultural activities. It is played in public and private areas and it is highlighted at many events to encourage the people and draw their attention.

Music is popularly known as the Universal language because it has no boundaries anybody can enjoy music irrespective of his age. It flows freely beyond barriers of language, religion, region etc. It has created its own industry and provided many job opportunities like singers, writers, composer, etc. Music can be greatly related with the lord Krishna's flute. It can be cited that in the Dvapara Yuga, the Gopikas would get mesmerized with this music and with surrender themselves to lord Krishna.

Research has provided that the plants which hear the music grow at a faster rate in comparison to the others. It helps in improving the concentration and is thus of a great help to these students. Most students hear the music when the feel disturb in order to improve their concentration power.

Music is the essence of life. Music is everywhere and music is everything. It's really a great thing that let us to forget our past and makes us to enjoy the present moment.

**G. SATHWIK**  
22251A04H1,2/4



## 45. CORRUPTION IN INDIA

A majority of us are probably aware of the term "corruption" and the situations in which the word perfectly fits in. The most plausible reference to the nature of corruption could be assessed by the words of Joe Bidden, 47th Vice President of the United States of America, who quoted – "corruption is just another form of tyranny." The statement weighs corruption as equivalent to that of cruel and oppressive rule of government. However, for a common man/woman, corruption is a challenge, that he/she faces every day, in protecting of his/her fundamental rights and privileges, otherwise guaranteed by the Constitution.

Though, the ranking of India in Global Corruption Index 2018 has been improved by three places; at a global rank of 78 it's still far from becoming a corruption free nation.

Corruption in India had been prevalent even under the subjugation of British Empire, when India was still far from gaining independence. How deeply rooted was the corruption in Indian society, can be assessed by the words of Mohammed Ali Jinnah. The Muslim League Leader once stated – "One of the biggest curses from which India is

suffering – I do not say that other countries are free from it, but I think our condition is much worse – is bribery and corruption. That really is a poison”.

This statement of Mr. Jinnah delivered while addressing the first Presidential address to the Constituent Assembly of Pakistan on 11th August 1947, bares naked the truth of corruption in India, even before independence.

Even after 73 years of Independence, not much has changed on that front for the people of India. On the contrary, corruption has grown in dimension and today, it seriously hampers the economic, social and infrastructural progress of the nation as never before.

Corruption in political and administrative system of the country, is curtailing its progress and it devoid the people of India of their basic rights of equality, freedom, right to equal opportunity and right to compulsory education and health among others.

Corruption is basically an act of collusion between two parties; however, more often than not one party might be forced into the agreement by another party.

Suppose, if a Public Works Department Engineer demands bribe from a civil contractor, for passing the bill for the portion of road constructed by the latter. In this case, though the demand is not obligatory on the contractor, he/she will mostly oblige considering the otherwise cumbersome process of proceeding legally against the demands. In this case the party who gives bribe is actually forced to do so by the party who demands it.

On the contrary, there could be situations in which both the opposite parties have colluded willingly in order to mutually benefit each other. For example, a non-deserving candidate for a government job, pays bribe to the recruiting official, in order to secure the job.

Nevertheless, whether forced or mutually agreed upon, corruption is an act of collusion, between two parties, which seriously compromises the privileges and rights of other individuals.

The corruption in any sector could be effectively controlled by working on improving transparency and accountability in that particular sector. Transparency will ensure that each and every functioning, decision and its outcome is known to the public and all, so that the fairness of the deal could be ascertained. On the other hand, accountability places responsibility of an undesirable outcome/loss on an individual.

**V.YESHITHA**  
22251A04C7,2/4



## 46. LITHIUM-ION BATTERIES: WHAT CAN WE DO BETTER?

With the world progressing towards sustainability in electronic aspects, it is no surprise that the automobile industry also fosters such evolution. From motorsport

championships allowing the functional materialisation of Formula E, the electric alternative to Formula 1, to the demand for lithium-ion batteries soaring exponentially, research in sustainable energy development is nowhere near sufficient.

The lithium-ion battery technology, whose primary component is cobalt, largely drives the shift towards the electric vehicle (EV) revolution. Despite becoming the go-to choice for EVs, these batteries are not without their challenges, primarily related to the use of cobalt. Cobalt is an essential component of lithium-ion batteries, specifically as a compound for the cathode. The cathodes store and release lithium ions during the charging and discharging process. The cathode is typically made from a material that can reversibly intercalate and deintercalated lithium ions, such as in lithium cobalt oxide. The performance and durability of a lithium-ion battery are heavily dependent on the properties of the cathode material. Cobalt has been widely used in lithium-ion batteries due to its high capacity and good electrochemical performance.

However, owing to the growth of electric vehicles and consumer electronics, the demand for cobalt has risen sharply in recent years. Cobalt mining has been associated with deforestation, habitat destruction, and disruption of oceanic ecosystems due to deep-sea mining of cobalt. Additionally, a significant portion of the world's cobalt production hails from countries with lax labour regulations, raising concerns about child labour, unsafe working conditions, and exploitations in cobalt mining operations.

Consequently, and in relation to a cobalt shortage between 2028 and 2033 appearing inevitable even in the most optimistic scenario, approaches to reducing the cobalt content in lithium-ion batteries included replacement with nickel, manganese, lithium iron phosphate and more, which seem to be beneficial solutions.

Recently, however, researchers at the Department of Energy's Oak Ridge National Laboratory have developed a new method for producing the key component of lithium-ion batteries. The researchers report in the Journal of Power Sources that they have developed a cleaner, cheaper, more efficient method for making a new class of high-capacity cathode material without cobalt and made of nickel, manganese, and aluminium (LiNi<sub>0.9</sub>Mn<sub>0.05</sub>Al<sub>0.05</sub>O<sub>2</sub>(NMA9055)).

The new method offers increased efficiency, and reduced the waste and usage of toxic materials, making it economically preferable. The new method, hydrothermal synthesis, crystallizes the cathode using metals dissolved in ethanol, which is much quicker, and safer to handle and store, causing the resulting material to have more tightly packed, uniform, and round particles that make it ideal for a cathode. Instead of continuously stirring the cathode materials with chemicals in a reactor, the hydrothermal synthesis approach crystallizes the cathode using metals dissolved in ethanol. The researchers are optimistic that the process will move the cathode industry toward cleaner, more cost-competitive production while reducing the strain on the environment.

The objective of eliminating cobalt from the lithium-ion battery industry is a multifaceted and continuous endeavour.



This will necessitate the development of novel materials and technologies as well as substantial research and development investments, but the potential advantages of cost reduction, environmental preservation, and sustainability endorse the field. Utilizing alternative materials in the battery production process can potentially reduce the environmental footprint of the industry and enhance the working conditions of the mining sector. However, it is essential to carefully weigh the trade-offs between various, as some materials may be more appropriate for certain applications than others. Ultimately, the emergence of alternative materials in the battery manufacturing process is a promising development that could have far-reaching environmental and sustainability benefits.

**MOUNICA KOMARAVALLI**  
20251A0448,4/4.



### 47. AMBITION IS A VIRTUE

There are eight “Ambitious Rules” that provide innovative solutions to the everyday struggle women face. These can be taking credit, deflecting detractors and handling confrontation. Going after your dreams, holding your head up high and not apologizing for ambition or success are must to inculcate in every individual.

Ambitious women are a woman who:

- Earns her worth
- Has more power
- Gets the recognition she deserves
- Has the determination to go after her dreams and can do it with integrity and without guilt.

Wouldn't it be great if you could say, “I am ambitious”, without cringing ever so slightly? Wouldn't it be inspiring if you could acknowledge straight up, to yourself and others, that you have big wild, and precious professional goals? Wouldn't it feel great to trust that you could be determined to achieve your career goals without compromising your personal life, but rather enhancing it? No wonder so many women simultaneously crave and fear their ambitious goals. Wouldn't it be great if women could ignore what our culture thinks about high-achieving women and eliminate the fear part of our ambition equation? I'm here to tell you that all of your priorities -personal and ambitious career goals alike- can fit together harmonious.

It Takes an Ambitious Woman to Know and Encourage one First, you give a woman support for being ambitious. You support her to see that the real way to make the contribution she was born to make is to place her inspiring career dreams at the top of her priorities list, not at the bottom of the pile and she never looks back. Embracing ambition makes you the best you can be.

The eight rules of ambition are:

- Be a Contender
- Get more power from powerful advice

- Don't be afraid of confrontation
  - Be more irresponsible to others-and more responsible to yourself
  - Be a power broker
  - Disable Detractors
  - Stop the fraud police-You deserve to be here
  - Recognize your unique abilities
- You owe it to yourself and the world to make the contribution you were born to make. And yes, you deserve it.

**B. HARIKA**  
21251A0405,3/4.



### 48. FUTURE OF ELECTRONICS AND COMMUNICATIONS ENGINEERING

The field of Electronics and Communication Engineering (ECE) has always been at the forefront of technological innovation, shaping the way we connect, communicate, and interact with the world. As we step into an era characterized by rapid advancements in digital technology, the future of ECE promises to be nothing short of transformative.

**The Rise of 5G and Beyond:** One of the most significant trends in ECE is the deployment of 5G networks and the exploration of beyond-5G (B5G) and 6G technologies. 5G, with its ultra-low latency and high-speed data transfer capabilities, has paved the way for a plethora of new applications. These include autonomous vehicles, augmented reality (AR), virtual reality (VR), and the Internet of Things (IoT). As ECE engineers push the boundaries further, B5G and 6G are expected to offer even faster speeds, seamless connectivity, and unprecedented levels of data exchange.

**Internet of Things (IoT):** The IoT revolution is set to continue its exponential growth. ECE engineers will play a pivotal role in designing and optimizing the intricate web of interconnected devices. From smart homes and cities to industrial automation and healthcare, IoT promises to enhance efficiency, convenience, and our overall quality of life. However, it also presents challenges related to data security, privacy, and the management of a vast network of devices.

**Artificial Intelligence (AI) and Machine Learning (ML):** ECE is increasingly intertwined with AI and ML. These technologies are used to analyse massive datasets, enabling smarter decision-making and automation. In the future, we can expect AI- powered communication systems that adapt in real-time to network conditions, optimizing performance and energy efficiency. AI-driven chatbots, voice assistants, and recommendation systems are already changing the way we interact with technology.

**Quantum Computing and Cryptography:** The advent of quantum computing is poised to revolutionize encryption

and data security. While quantum computing poses a potential threat to current encryption methods, ECE engineers are at the forefront of developing quantum-resistant cryptographic techniques. Moreover, quantum computing holds the promise of solving complex problems at speeds unimaginable with classical computers, revolutionizing fields like drug discovery, materials science, and optimization.

**Sustainable Electronics:** As environmental concerns intensify; sustainable electronics are becoming a top priority in ECE. Engineers are working on developing energy-efficient devices, eco-friendly materials, and recyclable components. This shift toward sustainability will shape the future of electronics, promoting green technology and reducing the industry carbon footprint.

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## 49. UNLOCKING INCLUSIVE LEARNING: TAILORING EDUCATION FOR EVERY LEARNER

So first I would like to ask everyone a question. Not my lines exactly. But still works. Does anyone feel the excitement or the joy of coming to college. The excitement that says “yes! we are going to learn something new today” (yes, reference from the film 3 idiots). Before joining college, every student believes they are going to be the rancho of their college. Turns out the circumstances and the environment and pressure around us turns us into Chathur cramming everything the night before exam spit it in the exam hall and never look back at it again. So when I questioned myself the reason we do that I started listing the possible reasons and although the reasons could be very diverse I believe the root cause of this lies in the way learning takes place. Every student has their own strengths and challenges in the process of learning and it is rightly said that “one size doesn’t fit everyone”. Some are visual learners; some are auditory learners and there are so many types. Therefore, it is very much important to create an environment inclusive for all the learners. Also, small changes will eventually lead to significant improvements...A few small changes to make diversified learning possible could be:

**Understand Individual Learning Styles:** Identify and acknowledge that students have diverse learning styles and preferences. Encourage self-assessment to help students understand their own learning styles.

**Differentiated Instruction:** Implement differentiated instruction techniques that allow for various learning paths and methods. This can include providing different reading levels, varied assignments, and flexible assessments.

**Universal Design for Learning (UDL):** Apply the principles of Universal Design for Learning to create

materials, lessons, and assessments that are accessible to a broad range of students. UDL emphasizes flexibility and customization.

**Varied Teaching Methods:** Utilize a mix of teaching methods, including lectures, group discussions, hands-on activities, multimedia presentations, and experiential learning to engage different learning styles.

**Flexible Seating and Classroom Layouts:** Arrange the classroom to accommodate various learning preferences. This might involve flexible seating options, quiet areas for focused work, and collaborative spaces for group activities.

**Scaffolded Learning:** Provide support and guidance in a structured manner, gradually reducing assistance as students become more independent learners. This helps students of varying abilities progress at their own pace.

**Inclusive Materials:** Select and develop instructional materials that represent diverse cultures, backgrounds, and abilities. This can help students relate to the content and feel included.

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## 50. EXPLORING DIVERSE CAREER PATHS AFTER BTECH

**Introduction:** In the ever-evolving world of technology, a BTech degree opens up plethora of career opportunities for graduates. Beyond the traditional roles in engineering, there exists a vast landscape of diverse career paths that cater to different interests and skill sets. In this essay, we will delve into some exciting career options that await BTech graduates.

**Software Development:** One of the most sought-after career paths for BTech graduates is software development. This field offers opportunities to design, create, and maintain software applications. Whether it’s mobile app development, web development, or working on cutting-edge technologies like AI and machine learning, software development is a dynamic and rewarding field. **Data Science and Analytics:** Data is the new oil, and data scientists are in high demand across industries. BTech graduates can specialize in data science and analytics, where they analyse and interpret data to drive business decisions, solve complex problems, and unearth valuable insights.

**Cybersecurity:** With the increasing reliance on digital technologies, cybersecurity has become paramount. BTech graduates can pursue careers as ethical hackers, security analysts, or consultants, protecting organizations from cyber threats and vulnerabilities. **Product Management:** For those with a knack for innovation and leadership, a career in product management might be enticing. Product managers play a crucial role in conceptualizing, developing, and launching products, bridging the gap between engineering and business.

**Entrepreneurship:** BTech graduates with an entrepreneurial spirit can venture into start-ups. They can develop innovative tech solutions, secure funding, and build





their own companies, thereby shaping the future of technology. Robotics and Automation: The field of robotics and automation offers exciting prospects for BTech graduates. They can work on

designing and building robots for industries like manufacturing, healthcare, and space exploration, contributing to the advancement of technology.

**Renewable Energy:** With the growing concern for the environment, renewable energy is a promising field. BTech graduates can work on designing and implementing sustainable energy solutions such as solar panels, wind turbines, and green infrastructure.

**Teaching and Academia:** Some BTech graduates choose to share their knowledge by pursuing careers in academia. They can become professors, lecturers, or researchers, contributing to the growth of engineering education.

**Management and Consulting:** For those interested in the business side of technology, management and consulting roles are viable options. BTech graduates can work as IT consultants or project managers, helping organizations streamline their tech operations.

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## 51. THE ROLE OF CRITICAL THINKING AND CREATIVITY IN EDUCATION

### Introduction:

In the ever-evolving landscape of education, the importance of critical thinking and creativity cannot be overstated. These twin pillars of intellectual development are not just desirable skills but fundamental to preparing students for the challenges of the 21<sup>st</sup> century.

### Critical Thinking: A Foundation for Learning:

Critical thinking is the ability to evaluate information, analyse complex problems, and make reasoned decisions. It is the bedrock upon which all learning is built. By nurturing critical thinking, educators empower students to question, reason, and delve beyond the surface of knowledge. This skill is not confined to the classroom but extends to everyday life, enabling individuals to make informed choices, engage in constructive debates, and adapt to new challenges.

### Creativity: The Engine of Innovation:

Creativity is not limited to the arts; it is a universal skill that involves generating novel ideas, solutions, and approaches to problems. It is the driving force behind innovation and progress in all fields, from science and technology to business and social change.

### Balancing Tradition with Innovation:

While traditional education has often focused on delivering a standardized curriculum, there is a growing recognition that this approach can stifle critical thinking and creativity. An excessive emphasis on standardized testing can promote memorization over understanding and conformity over innovation.

To strike a balance, educators must infuse opportunities for critical thinking and creativity into the curriculum. This might involve project-based learning, open-ended discussions, and problem-solving challenges that encourage students to explore ideas from different angles. By integrating creativity into the learning process, educators can prepare students for a future where adaptability and innovation are highly valued.

### Real-World Relevance:

The development of critical thinking and creativity extends beyond the classroom. These skills are essential for success in the workforce and in life. In professional settings, employees who can think critically are better at problem-solving, decision-making, and adapting to changing circumstances. Creativity drives innovation and entrepreneurship, contributing to economic growth and societal progress.

### Conclusion:

In conclusion, critical thinking and creativity are not optional skills but essential competencies for success in education and life. They empower students to think independently, adapt to change, and contribute meaningfully to society. As the world continues to evolve, education must evolve with it, prioritizing critical thinking and creativity as foundational elements of a well-rounded education.

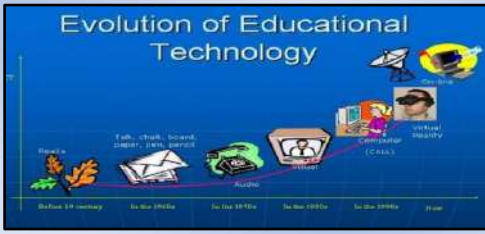
By emphasizing critical thinking and creativity, we prepare the next generation to be not only knowledgeable individuals but also responsible, creative, and adaptable members of society, capable of thriving in an ever-changing world.

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## 52. THE EVOLUTION OF EDUCATION: BRIDGING THE GAP BETWEEN TECHNICAL AND NON-TECHNICAL FIELDS

In today's fast-paced and ever-changing world, education plays a pivotal role in shaping the future of individuals and societies. Whether one pursues a technical or non-technical path, the significance of education remains undeniable. This article explores the evolving landscape of education, highlighting the key aspects of both technical and non-technical education and the increasing need for a harmonious blend of these two domains.



**Technical Education:** Technical education primarily focuses on equipping students

with specialized skills and knowledge required in specific fields such as engineering, computer science, medicine, and the trades. With rapid advancements in technology, technical education has gained prominence like never before. Here's why:

**Innovation and Progress Career Opportunities:**

**Problem Solving:** Technical education emphasizes problem-solving and critical thinking, skills essential for addressing complex challenges.

**Non-Technical Education:** Non-technical education encompasses a broader spectrum of subjects, including arts, humanities, social sciences, and more. It lays the foundation for a well-rounded, holistic education. Here's its significance:

**Cultural Enrichment:** Fostering a sense of identity and cultural appreciation.

**Soft Skills:** Global Citizenship

**The Need for Balance:** In the modern world, the divide between technical and non-technical education is increasingly blurred.

**Here are some reasons why a balanced approach is essential:** Interdisciplinary solutions, adaptability, innovation.

**Conclusion:** In conclusion, education, whether technical or non-technical, is a powerful tool for personal growth and societal progress. Rather than viewing these two streams in isolation, a balanced approach that integrates both technical and non-technical elements is the need of the hour. Such an approach can create well-rounded individuals who are not only proficient in their chosen fields but also capable of addressing the complex challenges of our time.

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advantages of online education is its accessibility. It breaks down geographical barriers, enabling students from diverse backgrounds and locations to access quality education. This inclusivity has the potential to democratize education, making it available to individuals who may have otherwise been excluded due to distance, disability, or other limitations.

Flexibility is another key benefit of online education. Students can tailor their learning schedules to accommodate work, family, or other commitments. This flexibility allows for a personalized approach to education, catering to the unique needs and learning styles of each student. Moreover, the availability of a wide range of courses and programs ensures that learners can pursue their interests and career goals more effectively.

Online education is also known for its cost-effectiveness. It eliminates the need for physical infrastructure, such as classrooms and transportation, reducing overhead costs for educational institutions. This, in turn, can lead to lower tuition fees and more affordable education for students. However, online education does come with its share of challenges. One of the most significant concerns is the potential for a lack of social interaction and engagement. Traditional classrooms offer face-to-face interaction with peers and instructors, fostering a sense of community and collaboration. Online students may miss out on these opportunities, which can impact their social and communication skills.

Another challenge is the need for self-discipline and motivation. Online learners must be self-driven to manage their time effectively, stay on track with coursework, and complete assignments independently. Procrastination and a lack of accountability can hinder success in online education. Furthermore, not all students have equal access to technology and a stable internet connection, which can create disparities in the quality of online education. Bridging the digital divide remains a critical challenge in ensuring equitable access to online learning.

In conclusion, online education has emerged as a powerful tool with the potential to transform the way we learn. Its accessibility, flexibility, and cost-effectiveness make it a viable option for many learners.

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### 53. ONLINE EDUCATION



Online education, often referred to as e-learning, has emerged as a transformative force in the field of education. This mode of learning leverages technology to provide students with access to educational resources and opportunities beyond traditional classroom settings. In this essay, we will explore the advantages, challenges, and future prospects of online education. One of the most significant

### 54. HOW TECHNOLOGY WILL BE USEFULL FOR STUDENTS IN FUTURE?

In recent years, technology has become an integral part of An education, revolutionizing the way students learn and teachers instruct. The integration of technology in classrooms has opened up new avenues for interactive learning, personalized instruction, and enhanced



collaboration. This article explores the various technologies used for students, shedding light on their benefits and potential challenges.



**3D Printing:** 3D printing technology is being used in education to bring concepts to life. Students can

design and print physical models, prototypes, and even functional objects, which enhances their creativity and problem-solving skills.

**Interactive eBooks:** Enhanced eBooks with multimedia elements, interactive quizzes, and embedded videos make reading and learning more engaging and informative.

**E-Libraries and Digital Textbooks:** Digital libraries and textbooks offer students easy access to a vast collection of reading materials, reducing the need for physical books and enabling quick searches and annotations.

**Online Debate Platforms:** Virtual debate platforms provide a space for students to engage in debates, improving their communication and argumentation skills.

**Student Response Systems (Clickers):**

Clicker systems allow students to respond to questions and polls in real-time during lectures, promoting active participation and instant feedback.

**Virtual Internships:** Virtual internship programs enable students to gain work experience remotely, preparing them for future careers.

**Digital Accessibility Tools:** Assistive technologies, such as screen readers and voice recognition software, support students with disabilities, making education more inclusive.

**Online Hackathons and Coding Challenges:** These competitions encourage students to apply their coding and problem-solving skills in real-world scenarios.

**Digital Lecture Capture:** Lecture capture technology records classroom lectures and makes them accessible online for students to review and study.

**E-Sports Programs:** Esports teams and programs in educational institutions promote teamwork, strategic thinking, and competition in the gaming arena.

**11. Holographic Learning:** Holographic displays and presentations offer immersive educational experiences, particularly in subjects like anatomy or engineering.

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## 55. GLOSSARY OF TECHNICAL TERMS

**What are technical terms?** Technical terms are words or phrases that people use in a specific career field. These

terms can be any word, phrase or acronym that has a specialized meaning within a particular field of expertise, such as words for equipment, personnel, software or processes. You can use technical terms to save time when communicating with other knowledgeable people in the industry. Your colleagues and professional peers may also develop abbreviations as the terms become more common.

Some of the technical terms are as below:

**Ethernet:** Ethernet is the most common way to connect a device to a network using a physical connection. It involves connecting devices in a wired local area network (LAN) or wide area network (WAN), enabling them to communicate using a common network language. An Ethernet connection is faster, more secure and more reliable than a Wi-Fi connection.

**Encryption:** Encryption is the process of converting data into a code that's hard to decipher, which helps keep the data private. Encryption converts human-readable plain text to incomprehensible text, known as ciphertext, using cryptographic keys. It involves scrambling data, so only official parties can understand the information.

**Cookie:** A cookie is a piece of data a web server sends to a browser. It comprises unique identifiers web servers can use to remember you, your preferences and online browsing patterns. This allows the server to customize advertisements and other internet content to your preferences to provide a more satisfactory user experience.

**Authentication:** Authentication is how companies verify a person's identity or device before allowing them to access network systems. This cybersecurity strategy can protect an organization's sensitive information from unofficial access. The three main authentication factors are knowledge factors, such as passwords and other confidential login details, possession factors, such as an access card or key fob, and inherent factors, such as fingerprints.

**Ad hoc network:** An ad hoc network is a type of local area network (LAN) that you can build spontaneously without using a wireless router or access point to connect two or more wireless devices. This means it's a single-use network that doesn't support an ongoing connection. An example is a connection between your phone's hotspot and a friend's computer.

**Malware:** Malware is a term for malicious software unethical hackers use for illegal access or to harm a system. They can include viruses, spyware, adware and ransomware. Organizations can hire cybersecurity professionals, such as ethical hackers and penetration testers, to develop security systems that can identify and protect computer systems against malware.

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## 56. FROM CLASSROOMS TO CAREER: BTECH IN ECE AND BEYOND

After completing a Bachelor of Technology (BTech) in Electronics and Communication Engineering (ECE), you have a wide range of career opportunities available to you. Here are some common options:

**Higher Education:** You can pursue a Master's degree (MTech or MS) in ECE or related fields like VLSI design, embedded systems, communication systems, or signal processing. This can open up opportunities for research, teaching, and specialized roles.

**Jobs in Electronics Industry:** You can work in various roles in the electronics industry, such as hardware design engineer, software engineer, quality assurance engineer, or product manager for companies that manufacture electronic devices and components.

**Telecommunications:** There are many career opportunities in the telecommunications sector, including roles in network engineering, RF (Radio Frequency) engineering, and system administration for telecom companies.

**Embedded Systems:** You can specialize in embedded systems and work on designing and developing embedded hardware and software for devices like microcontrollers, IoT devices, and automotive systems.

**VLSI Design:** If you have an interest in semiconductor technology, you can work as a VLSI (Very Large-Scale Integration) design engineer, involved in designing integrated circuits and chips.

**Signal Processing:** Careers in signal processing involve working on technologies like image processing, speech recognition, and audio processing. You can work in industries such as multimedia, medical imaging, and more.

**Research and Development:** Research positions are available in both academia and industry. You can work on cutting-edge technologies, contribute to innovations, and publish research papers.

**Government Jobs:** Public sector organizations like BSNL, ISRO, and DRDO hire ECE graduates for various technical and research roles.

**Entrepreneurship:** If you have innovative ideas, you can start your own electronics or technology-related business. This could involve developing new products or offering specialized services.

**Data Science and AI:** With additional training, you can enter the fields of data science and artificial intelligence, which have applications in various industries, including ECE-related fields like image analysis and sensor data processing. Remember that the specific opportunities available to you may vary depending on your skills,

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## 57. KARATSUBA'S ALGORITHM

Multiplication is one of the first and basic operations we study in mathematics, making it hard to imagine a scenario where multiplication is not used. It's so simple and fundamental that it's challenging to fathom that until the late 1970s, most electronic devices did not have a dedicated multiply operation. Programmers had to use loops and addition to implement a multiplication routine. Mainframe computers that did support multiplication also internally employed a similar routine to achieve the results. As the number of on-chip transistors continued to increase, more adders were added on a single chip to support faster multiplication.

The major reason behind this was that addition was much faster than multiplication. For an entire millennium, it was thought that multiplication could only be performed in  $O(n^2)$  time complexity, which was done using the usual method we learn for multiplication by hand, known as long multiplication. This time complexity becomes very large when dealing with larger numbers. In 1960, Anatoly Karatsuba proposed what we now know as Karatsuba's algorithm in a seminar. This algorithm suggests a divide-and-conquer method and is further improved by using recursion.

To explain the algorithm using a simple example, if we want to multiply 31 and 32, the usual long multiplication algorithm multiplies 3 by 32 and then 1 by 32, shifts, and adds the numbers. Karatsuba's algorithm, on the other hand, multiplies  $(3 + 2)$  by  $(3 + 1)$ . The first and last digits of the product is found by multiplying the first digits of both numbers together and the last digits together.

Once we have the first and last digits, we subtract the sum of these two from the initial multiplication, which yields the middle digit. While this algorithm may seem to involve more steps, especially for larger numbers, it is efficient. The time complexity is  $O(n^{1.52})$ . This marked a significant milestone and proved the conjecture wrong. Following this development, the Schönhage–Strassen algorithm was introduced, offering an even better time complexity. It found applications in searching for primes and approximating pi. This algorithm held the title of being the fastest until 2007 when Furer's algorithm was introduced. Furer's algorithm is now recognized as one of the fastest known algorithms for integer multiplication. Both of these algorithms are built upon the foundation of the fast Fourier transform (FFT) and have practical applications in various fields, including computer algebra systems, computational number theory, and cryptography. They are especially valuable when dealing with extremely large polynomials, often encountered in advanced mathematical computations and cryptographic protocols.

The most recent significant breakthrough in this area occurred in 2019 with Harvey and Joris VanderHoeven's algorithm. In theory, this algorithm is expected to achieve the best possible time complexity, as predicted by Strassen, but as of now, there is no conclusive proof to confirm this claim.



Nonetheless, ongoing research and developments in computational mathematics continue to push the boundaries of what is possible in terms of algorithmic efficiency.

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## 58. THE ROLE OF ARTS AND CREATIVITY IN EDUCATION



In today's fast-paced, information-driven world, the role of arts and creativity in education has taken on a heightened significance. Beyond the traditional subjects of math,

science, and literature, arts education plays a pivotal role in shaping well-rounded, innovative, and emotionally intelligent individuals. This article explores why arts and creativity should be an integral part of every educational curriculum, highlighting their benefits and the methods by which they can be incorporated effectively. Arts education encompasses a broad spectrum, including visual arts, music, theatre, dance, and creative writing. It extends beyond the mere acquisition of artistic skills; it cultivates critical thinking, self-expression, and harnesses the creative potential inherent in all students.

One of the fundamental aspects of arts education is its ability to foster creativity. Creative thinking is highly prized in today's workforce, as it allows individuals to approach problems with innovative solutions. By engaging in artistic activities, students learn to think outside the box, making connections and developing ideas that transcend traditional boundaries. Furthermore, arts education enhances critical thinking. When students analyse and interpret works of art or create their own, they are required to think critically, make informed judgments, and communicate their insights effectively. These skills are not confined to the realm of the arts; they spill over into other academic subjects and life situations.

Arts education also plays a pivotal role in building confidence. Whether students are performing on stage, presenting their artwork, or expressing themselves through music, they gain a sense of accomplishment and self-assurance. This self-confidence is a crucial foundation for personal growth and future success.

Additionally, arts education promotes cultural awareness and tolerance. Exposure to various art forms from different cultures allows students to appreciate diversity and gain a global perspective. It encourages open-mindedness and empathy, qualities that are increasingly essential in our inter-connected world. Incorporating arts and creativity into the curriculum is not an isolated endeavour. It can be achieved through dedicated arts classes, interdisciplinary

projects, and collaborations between arts educators and their peers in other subjects. This holistic approach ensures that the benefits of arts education permeate all aspects of a student's learning journey.

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## 59. EMPOWER HER, EMPOWER THE WORLD

In a world that's constantly evolving, women have emerged as trailblazers, redefining the boundaries of excellence in every sphere of life. From science and technology to politics, sports, and the arts, women are not just breaking glass ceilings; they are shattering them into a million pieces. The story of women's excellence is a tale of resilience, determination, and unwavering commitment. The words "women empowerment" are made up of two words: "women" and "power." Giving someone power or authority is referred to as empowerment. As a result, women's empowerment entails putting power in their hands. It means that women should have equal opportunities in all fields, regardless of discrimination. They were denied equal access to education and self-sufficiency. Our society comprises men and women. In earlier times, men were considered to be the leading members of a family. They were the family's decision-makers and were responsible for earning their living. On the other hand, women were responsible for home chores and child-rearing. So, the roles were mainly based on gender. There was no involvement of women in decision-making. If we assess our entire sector, then research says that women's issues are either focused on their reproductive role and body or their economic role as a worker. But none of them is focused on empowering women.

Women empowerment is all about giving women power and control over their lives. So that they can become anything they want and do whatever they want in situations where they weren't allowed too before. In simple words, it means giving women control over their lives by letting them study, work, and wear whatever they want. It will help them to overcome their weakness and boost their confidence. The 21st century has ushered in an era of profound transformation and empowerment for women across the globe. From science and technology to politics, entrepreneurship, and the arts, women are excelling in all fields, challenging stereotypes, and rewriting the narrative of gender roles. Women entrepreneurs are making their mark in the business world. From tech startups to traditional businesses, women are launching ventures that not only succeed but also prioritize social responsibility and sustainability. Initiatives supporting women entrepreneurs and venture capitalists recognizing their potential are creating an environment for women to thrive. Women artists, writers, musicians, and performers are contributing

significantly to the world of arts and culture. Female creators are challenging norms, producing thought-provoking works, and addressing critical societal issues through their art. Figures like Beyoncé, Chimamanda Ngozi Adichie, are paving the way for diverse voices in the arts. "Empowering women is not just a choice; it's a global necessity.

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## 60. EMPOWERING WOMEN FOR A GLOBAL IMPACT



I stand straight, aim high, and achieve it. There's nothing and no force that can stop me.

Women's empowerment can be defined as promoting women's sense of self-worth, their ability to

determine their own choices, and their right to influence social change for themselves and others.

Women's empowerment has various components: women's sense of self-worth, their right to have and determine choices, their right to have access to opportunities and resources, and their right to control their own lives.

In today's rapidly changing world, the role of education in empowering women cannot be overstated. G. Narayanamma Institute of Technology and Science (GNITS) has emerged as a beacon of women's empowerment, not just within its campus but also on a global scale. \*GNITS\* has been instrumental in nurturing and empowering women to make a significant impact on the world stage.

Our institution has a rich history of providing high-quality education to women, equipping them with the skills and knowledge needed to excel in diverse fields. This commitment to academic excellence has empowered countless women to achieve their dreams and become leaders in their respective domains. The college doesn't just prepare women to be employees; it also fosters an entrepreneurial spirit. Through incubation centres and entrepreneurship programs, the college encourages women to turn their innovative ideas into successful businesses. GNITS has produced a remarkable number of women entrepreneurs who are making waves in the business world. Our institution recognizes the importance of a global perspective in today's interconnected world. The college has established partnerships with international institutions, enabling students to participate in exchange programs and gain exposure to diverse cultures and ideas. Such experiences empower women to think globally and

contribute to solutions on an international scale. Empowering women to take on leadership roles is a cornerstone of our institution's approach to education. Leadership programs, mentorship opportunities, and extracurricular activities help women develop the confidence and skills required to lead in various spheres, be it in academia, industry, or civil society. The college understands the significance of giving back to the community. Through outreach programs, social initiatives, and community service projects, students are encouraged to use their education to address real-world challenges and contribute positively to society. This sense of responsibility empowers women to make a meaningful impact on the world around them.

In conclusion, GNITS has set a shining example of how education can empower women to make a significant impact on the world.

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## 61. UNLEASHING THE POWER OF YOUR CONFIDENCE



Hello readers, Let's talk about this magical word confidence which brings all that we wish into in our lives. Confidence is something which will make your connections stronger, it is which

makes you achieve your goals, it is which makes you stand-out from others to share your perspective. We see people around us doing great things, every day we come across large number of posts from people on social-media achieving their goals and trying their best to make the world a happier place to live.

So, let's learn to succeed and to face failure using our confidence.

1. Writing a diary. Do you know that a positive self-talk has great results on how we think and there by lead to success? Writing what you have learnt every day from the situations you face, people you meet and people you follow on social media can make you feel confident and you can avoid to repeat the same mistakes again.

2. Say no Most of the times we say yes to many people to help them just to feel helpful, but this might affect our work and schedules so set boundaries for how much time you can chat or help or hop around and learn the art of telling No. It's same like dieting, isn't it?

3. It's okay to fail Most of us feel bad to take failures but confident people understand that they are part of the journey. Did you ever admire Mr. Cool- M. S. Dhoni, his



secret is to encourage team India not minding the un/controllables of the game? Thomas-Alva Edison told, he never failed he just discovered 10,000 ways that don't work.

4. Gratitude Now, how is gratitude related to confidence? well now, I want you to imagine the last time when you felt confident, was it when you gave a talk on stage? or got full marks in the exam? or when you received a prize for your art? mostly this right? Now why were you feeling confident in these moments because you feel positive about the skills whether to your artistic, speaking or thinking skills. Now when you start identifying that you possess some treasure, let it be from the basic needs like food which still some people in India suffer without or about the environment you are offered with or the luxury of having available with things like internet, this practice of gratitude can have a great impact to boost yourself in the long run.

5. Stay updated and help others Everyone has their own interests, be updated about your favourite topics let it be art, code, marketing etc, help people around you in these areas, this brings positivity.

6. Listen to stories The stories or podcasts of people who are already successful in your field of interest make you feel rejuvenated and make you identify the right path that has to be followed.

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## 62. FUTURE OF ENTREPRENEURSHIP

**Navigating an Evolving Landscape.** Entrepreneurship has always been a dynamic and vital component of the global economy. It represents the spirit of innovation, risk-taking, and the pursuit of opportunities to create value. As we stand on the threshold of a new era, the future of entrepreneurship is poised to undergo transformative changes.

This essay explores the evolving landscape of entrepreneurship and the key factors that will shape the future of entrepreneurs. The future of entrepreneurship is intricately linked with technology and innovation. Advancements in artificial intelligence, automation, blockchain, and other emerging technologies are providing entrepreneurs with new tools and opportunities. Automation, for instance, is revolutionizing industries like manufacturing and logistics, creating room for innovative business models.

Entrepreneurs who embrace these technologies will be better positioned to disrupt existing markets and create new ones. In recent years, there has been a significant shift towards sustainability and social responsibility in entrepreneurship. Consumers are becoming more conscious of their environmental footprint and the ethical practices of businesses. Future entrepreneurs will need to integrate sustainability into their business models and prioritize

responsible practices to gain a competitive edge and address pressing global challenges.

The COVID-19 pandemic accelerated the adoption of remote work and digital nomadism. This shift has opened up new possibilities for entrepreneurs who can now build teams and collaborate globally, transcending geographical boundaries. In the future, entrepreneurship may become even more decentralized, with entrepreneurs seeking talent and markets worldwide. Access to funding has always been a critical factor for entrepreneurs. In the future, traditional funding models may evolve. Crowdfunding, venture capital, angel investing, and decentralized finance (DeFi) are likely to play more significant roles in supporting entrepreneurial ventures. Entrepreneurs will need to adapt to these changing funding landscapes to secure the resources they need. The future of entrepreneurship will undoubtedly be marked by uncertainties and disruptions, as demonstrated by the pandemic. Entrepreneurs will need to develop resilience and adaptability to navigate through crises and changing market conditions. The ability to pivot, innovate, and persevere in the face of adversity will be paramount.

Globalization is breaking down barriers, making it easier for entrepreneurs to expand their reach internationally. However, it also requires a deep understanding of diverse cultures and markets. Future entrepreneurs will need to be culturally sensitive and adaptable to succeed in the global arena. The future of entrepreneurship promises an exciting and dynamic landscape, filled with both challenges and opportunities. As technology continues to evolve, sustainability becomes imperative, and the world becomes more interconnected, entrepreneurs must be prepared to adapt and innovate. The entrepreneurs of tomorrow will be those who harness technology, embrace sustainability, foster resilience, and exhibit cultural sensitivity. They will be the driving force behind economic growth, innovation, and positive change in the years to come. The future belongs to those who dare to dream, create, and shape the entrepreneurial landscape of tomorrow.

**G. KUSUMANJALI**  
22251A0412,2/4



## 63. INFLUENCE



The words in the definition of influence are words such as force and produce effects. This means that influence causes a change or a movement. Then the next part covers words such as actions, behaviour and opinions. The audience ultimately determines how well and easily they are going to be influenced. Even if you were born with a golden tongue and have the facts behind you, you probably still won't convince everyone of everything you

would like. A strong communicator with an important message can win over most audiences. Another word that frequently enters our vernacular and is used interchangeably with influence is “Motivate.” There is again a difference here. Motivation requires giving someone a 'motive', usually self-interest or self-preservation along the lines; while influencing is a higher-level skill that makes the desired action their idea.

One adage says, motivation gets you going. Influence is what makes you go in a particular direction. But aren't we as humans always motivated, even if that motivation is to sit on the couch, eating potato chips, and watching soap operas? Something is driving our deepest affections, whether that is to veg-out or train for a marathon.

Influence is what takes us in a particular direction. Influence is the primary ingredient needed to move others toward an objective. Influence best happens when it is intrinsic, as extrinsic motivation is fleeting. Money, perks, and extra time off are temporary and are not tied to the actual task at hand. Those motivated by them can quickly disassociate from the mission as soon as better money, perks and extra time is offered by a less noble cause or objective. But...let someone understand THE WHY and they will see the objective itself as vital. In this case they will be influenced to join arms and march the streets of Selma for no pay while in fact putting themselves in danger. Build THE WHY into a team and you'll have a soldier risking his life to get a fellow injured soldier out of harm's way. At that moment, he won't be thinking about a medal as motivation, rather the influence that has been poured into him will take hold as he risks life and limb to not leave any man behind. For leaders of the future, who will likely be working within increasingly flat structures, our research suggests that transformational influence is more important to master than transactional and it is easy to see why those who aspire to lead would be more inclined toward it. The very notion of leadership is becoming extinct as the world moves toward more agile, participative ways of working, and traditional, top-down organizations flatten and dissolve.

G. SRI VAISHNAVI  
22251A04A5 ,2/4



## 64. MISERABLE MORNING

**MORANCHAPALLY:** A sense of despair prevails over Moranchapally, a village in Jayashankar Bhupalpally district, as its inhabitants attempt to pick up the pieces of their lives. Over a week after the floodwaters from the swollen Moranchavagu submerged the village, the villagers are still trying to rebuild their lives and come to terms with the extensive damage to homes, fields, and livelihoods. Youth in the village were seen repairing damaged paths to their houses, while others struggled to remove power cables from the rooftops. Women were seen sitting on the roadside,

discussing their losses and the challenges ahead. Elderly farmers, with the help of tractors, were seen clearing the garbage and debris left behind by the deluge. The devastating impact of the floods has rendered many villagers unemployed, leaving them desperate for work opportunities. With agricultural fields covered in layers of sand and mud, the villagers found it impossible to engage in farming activities. Kotagiri Thirumala and P Rajitha, sitting on the banks of the Moranchavagu, expressed deep sorrow and uncertainty. Thirumala recounted a loss of Rs 5 lakh, including the family's belongings and damaged property, while Rajitha pleaded for financial assistance from the government to rebuild her collapsed house. R Sunitha, P Ravali, P Rajitha, and others were seen looking for work at the roadside. They are unable to work in their own fields. Sunitha showed her residence whose roof had collapsed. She is now using a polythene sheet to shield her family from the rain and sun. Her two children are staying at the government school in Karkapally village.

In Chenchu Colony, 18 families lost their houses and were forced to live in makeshift tents. E Kaveri and her community faced difficulties finding rental houses due to discrimination based on their Chenchu Identity. “We do not have any household articles. All of them were washed away,” she said. M Lakshmikantha, a member of the Chenchu Colony, played a heroic role in alerting others about the impending disaster on July 27. “I warned them about the impending calamity. I took them all to my house. I provided accommodation on the first floor of my house. The floods washed away eight quintals of rice, six heads of cattle, and the standing crops in our nine-acre land. What is left are sand-covered fields,” she said. Ch Shobha, a villager, who sat outside her house shuddered as she recalled the nightmare. Her house was very close to the Morancha Vagu. “I was with my daughter in my house. She came to us for her delivery. At 4 am on July 27, my husband noticed that the vagu was swelling with each passing minute. As the waters reached our house, he woke us up and led us out. My daughter and I rushed to the neighbour's residence and climbed to the top of the building. We were later rescued and shifted to a nearby village,” Laxmi said. The plight of R Ramya, a PhD scholar, and other residents was equally heartbreaking as their certificates and belongings were swept away by the floods. V Ashok, whose house is about to collapse, said that his son-in-law does not want to live in the house and is now demanding a dowry. Ashok wants the government to come to his rescue.

N. SANJANI REDDY  
22251A04F2,2/4



## 65. DO ALIENS EXIST?

Let's try to answer an age-old question. Do Aliens exist? We all have seen the movies, read books about them, and must



have wondered about this at least once. Conspiracy theorists claim that UFOs are visiting us all the time and the reports are just being covered up. But what is the truth? Is it fact or fiction? Are there really aliens out there? Well, the answer is complicated, and we may never know for sure. Scientists are discovering thousands of earths like planets every year considering that the universe is 13.8 billion years old, it must be teeming with life. And we have seen how much we have progressed technologically in just the past 200 years, so with so much time there should be at least some civilizations which can communicate with us. So where is everyone? And most importantly why are we not able to find them? This is called the Fermi Paradox. No one knows the answer for it. The possibilities are numerous with some of them quite dark. It may be possible that there have been advanced civilizations in the past, but they have been completely wiped off because of their own destructive technology. If so, then this must be a cautious reminder for us to be careful with our technology as we already have nuclear weapons which can destroy us over and over again. Another possibility is that maybe there are aliens out there but are too far away from us to even communicate. The universe is insanely vast, and we really haven't seen all of it yet and will probably never know about it because of the huge distances separating us from the other parts of the universe.

And with the galaxies moving away from each other it is impossible for us even with the most advanced technology to contact them unless we can find wormholes. Or our technology is simply not advanced enough yet to contact aliens or the reverse can happen- aliens do not have the technology to contact us as life may still be in its primitive forms like bacteria. It is also possible that there are people out there who know about us but are simply not interested in contacting us. They can be watching us and looking for the right opportunity to invade if we become a threat for them. Sounds scary right, well don't get scared because the simplest answer to this question maybe the most obvious one- we are not able to find aliens because they do not exist. Maybe life is really very very rare in our universe and has happened only once in the past 13 billion years and may never happen again. We are and will forever be alone in the vastness of space and time. Sounds a bit despondent right? Well not so fast. We are currently in the best period of human history with the most advanced technology and constant innovation. In a few hundred years, we may colonize our galaxy and become the first inter-planetary species to venture out into the oblivion

**T. PRATHIMA**  
**21251A04F5,3/4**

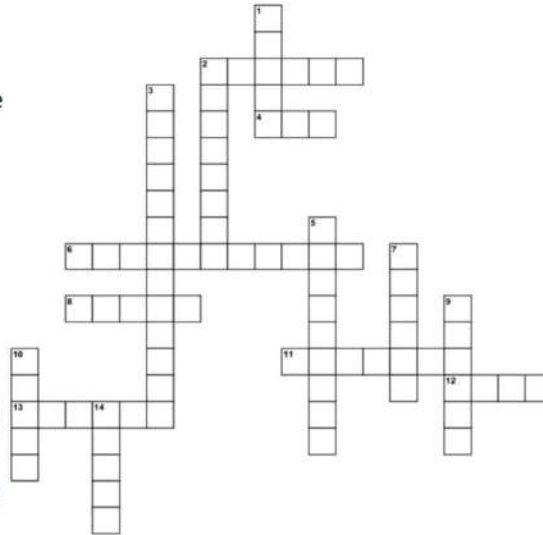


## CROSSWORD PUZZLE

### DIGITAL LOGIC LEXICON

#### Across:

- [2] Maximum number of digital inputs that the output of a single logic gate can feed without disrupting the circuitry's operations
- [4] Data type used to hold the values between assignments in Verilog
- [6] Parallel to serial converter
- [8] Number system of base 8
- [11] Verification of logic
- [12] Binary numeral system such that two successive values differ only in 1 bit
- [13] Assigns an expression result or value to a variable



#### Down:

- [1] Coincidence Logic Gate
- [2] 1 Bit storage element
- [3] Statement which is used to define the design hierarchy by making a copy of a lower level design entity within an architecture
- [5] Written to check the functional correctness based on design behaviour
- [7] Fundamental descriptive unit in Verilog HDL
- [9] Next state output of a JK Flip Flop when  $J=K=1$
- [10] Finite-state machine whose output values are determined by both its current state and the current inputs

K.SAI KEERTHANA  
22255A0413,3/4



## TECH RIDDLES

- The more you code, the more of me there is. I may be gone for now but you can't get rid of me forever. What am I?
- I'm a language for everything yet I have no real identity of my own. Good luck trying to compile me. What am I?
- As a developer I'm your eyes, showing you the result of your code in your language of choice. What am I?
- I'm used to build larger structures. While you'll find many different kinds of me, we all just mess with information in different ways. What am I?
- As a developer, you usually get mad at me because I complain a lot, although I'm usually right. What am I?
- I am a programming language that sounds like a snake. What am I?
- I'm a type of code, often used for hiding messages or securing information. My name rhymes with "in code." What am I?
- I'm a storage device that spins, but I'm not a bicycle. What am I?
- I'm a giant web, connecting all, with information at my beck and call. From cat videos to knowledge deep, what am I, in which you often creep?
- I'm a statement in C used to transfer control from a function back to the calling function. What am I?

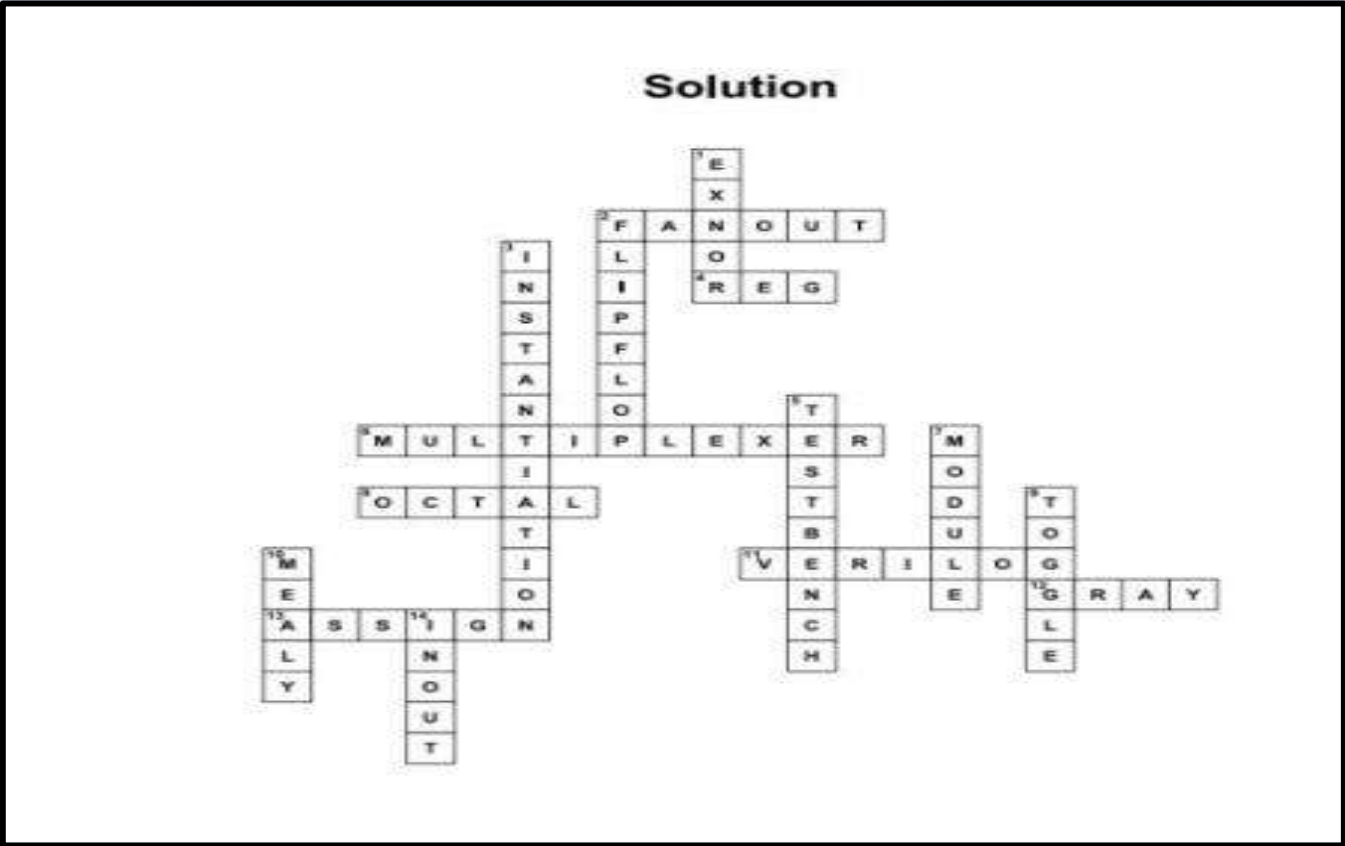
K. NETHRA SRI  
21251A04E4,3/4





**ANSWERS:**

**CROSSWORD PUZZLE:**



**TECH RIDDLES:**

1. A bug
2. Pseudocode
3. A print statement
4. A data structure
5. A compiler
6. Python.
8. A hard drive.
9. The Internet
10. Return

### **Program Educational Objectives (PEOs)**

**PEO1:To impart the knowledge of basic sciences , mathematics and programming skills in solving various Engineering problems pertaining to the field of Electronics and Communications**

**PEO2:To train the students in analyzing , designing and imparting research based knowledge and acquainting them with modern scientific tools**

**PEO3:To create professional , ethical environment and to inculcate effective communication skills**

**PEO4:To encourage team work and interdisciplinary ideas benefiting the society**

**PEO5:To motivate students to be independent with a desire for life long learning and adapt to the changing professional needs**

### **Program Specific Outcomes – B.Tech. (ECE)**

**PSO1: Research Activities : Develop abilities to successfully analyze, execute and synthesize hardware and software oriented mini- and technical major- projects in identified specializations and areas of interest, and enrich industry compatibility.**

**PSO2: Professional Outlook : Establish a good knowledge sharing network and peer connectivity through Professional Society Memberships, Conduct of seminars, Technical Events and Conference Paper Presentations, and earn prominence.**



## VISION

ECE dept envisions to develop high quality and technically competent women engineers who can address the growing challenges in the modern world with a keen sense of social responsibility.

## MISSION

- Knowledge Based Engineering Education (Quality)
- Analysis and Design Skills with Modelling Potential, Technical Competence
- Industry Compatibility and Women Empowerment with Societal Commitment
- Professional Career Growth with Values and Ethics

## Program Outcomes (POs) – B.Tech. (ECE)

**PO1: Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

**PO2: Problem Analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

**PO3: Design & Development Solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

**PO4: Investigation of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**PO5: Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

**PO6: Engineering & Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**PO7: Environment & Sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO8: Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**PO9: Individual & Team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**PO10: Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

**PO11: Project management & finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

**PO12: Life Long Learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.