Volume10|Issue2

TESLATECH

CHANGE THE WORLD MIND

DEPARTMENT OF ELECTRONICS & TELECOMMUNICATION ENGINEERING

26th January 2025

INSIDE

Strength

Mr. Ghule D.K.
Ms. Landge P.P.
Ms. Jokar S. J.
Ms. Khalsode A. D.
Ms. Udane A. B
Ms.Jadhav S.S.
Mr.Deshpande P.D.
Ms.Bharma S.S.
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Mr. Shelar O.D.
Ms. Sutkar P. B.

ABOUT OUR DEPARTMENT

We started our journey in the year of 2008.To produce highly qualified, well rounded and motivated diploma candidates who can meet new technical challenges, contribute effectively as team members and be innovators in Electronics & Telecommunication Engineering field. To pursue creative research and new technologies in Electronics & Telecommunication Engineering disciplines in order to serve the needs of industry, government, society and scientific community. To inculcate strong ethical values and responsibility towards society. This has been achieved by the collective and responsive effort of the faculty, the supporting staff and the students. Department of Electronics & Telecommunication Engineering is one of the latest branches of Engineering in the modern era of technology. It is a rapidly growing field with a wide range of job opportunities.

Skill development program in our department is one of the most unique activities. Technical, professional, social, interpersonal aspects of student personality are some of the key attributes that are honored at our department. Excellent curricular, co-curricular, extra-curricular and extension activities are our performance indicators. The journey of student learning from fundamentals to advances in mechanical engineering at our department is accompanied by several value-added activities

Vision

- To produce skill based technical manpower as per requirements of modern industry in the field of electronics & telecommunication engineering.

Mission

- To impart high quality technical skills to satisfy the beads of modern industries.
- To build a strong foundation to enable students to face challenges in the relevant field.
- To impart moral ethical and social valves to bring out responsible humans.

Message from the Head of Department

It brings me immense joy & pleasure to introduce the Second edition of the academic year 2024-2025 departmental newsletter TESLATECH. The newsletter invites a wider readership in the Institution. My heartfelt congratulations to the editorial team. The Even semester of 2024-25 has been full of exciting activities for the students,and staff in the Department Electronics & Telecommunication Engineering at B.M.Polytechnic Solapur.

Mr. Ghule D.K.

HOD

Memorandum of Understanding:

We have signed the MOU with following industries:

- ***PMS Robotics***
- ***Shams Energy***
- ***siddhanath sugar mills***

Expert Lecture :

The department has conducted the Expert Lecture program under the Experts from various Industries for 3rd and 5th semester students. Which imparted the required skill set to efficiently increase the employability and about social oriented preparation of the students.

- ***HARDWARE MAINTENANCE :-BY PITAMBAR THAMBE***

- ***MOBILE COMMUNICATION & BROADCASTING :-BY SUHAS SWAMI***

Industrial Visit :

1. Industrial Visit of Second and Third Year Students conducted at **Ultratech cement,Hotagi**

2. Industrial Visit of Second and Third Year Students conducted at **95 FM, Jule Solapur**

Faculty Article :

IoT and Cloud Based Healthcare Monitoring and Diagnosis By Using Fuzzy Neural Network

Prof. Jokar S.J.

I. ABSTRACT:-

- The healthcare monitoring and diagnostic system has radically changed the manner in which medical care is provided. It has improved patient outcomes, increased productivity, and given people greater control over their treatment. Regular system assessments and enhancements are essential to ensuring the system's correctness and efficacy. Fuzzy neural networks, cloud computing, and Internet of Things have the power to dramatically change healthcare monitoring and diagnosis. Cost-effectiveness, remote monitoring, and real-time data collection are just a few of its many benefits. It is imperative to solve the concerns and problems associated with these systems in order to guarantee the safe and effective use of this technology in healthcare. The recommended method assesses the patient's condition by using sensors for pulse rate, body temperature, and blood pressure. In order to support intelligent decision-making regarding patient care, monitoring, and administration in order to identify potential illnesses and cures, the system makes use of a fuzzy logic framework and information database. Furthermore, the proposed methodology aims to enhance the system's efficacy concerning personnel utilisation, expenses, and patient treatment and monitoring duration. The suggested approach of using sensors for patient monitoring shows sensible accuracy and price savings when compared to the current methods in use. So far, the proposed methodology has proven to be widely applicable and can be adapted to more critical settings such intensive care units, operating rooms, neonates, and patients with higher levels of complexity.

- **INTRODUCTION:-** The healthcare monitoring and diagnosis system is a crucial tool in the healthcare industry[1] that is designed to track and monitor the health of patients, provide accurate and timely diagnosis, and improve overall healthcare outcomes[2]. This system utilizes advanced technologies and data analysis to gather and analyze patient information, enabling medical who
- have long-term medical issues or who are at a higher risk of experiencing health complications should pay particular attention to this. Healthcare practitioners can track vital indications including

blood pressure, blood sugar levels, and heart rate in real-time by utilising wearable technology and remote monitoring tools. This makes it possible to identify any changes or anomalies early on, which enables timely management and helps to avoid major health problems. Moreover, the healthcare monitoring and diagnosis system also promotes patient empowerment and engagement. Patients can access their health data and monitor their progress through user-friendly apps and portals. This enables individuals to take an active role in their own medical treatment and make necessary lifestyle changes to improve their health outcomes. The system also facilitates better communication and collaboration between healthcare providers. With a centralized database and secure sharing of patient information, healthcare professionals can easily access and share data with each other. This ensures a coordinated and efficient approach to patient care, leading to better outcomes[5].

However, like any technology, the healthcare monitoring and diagnosis system also has its limitations. Therefore, it is crucial for healthcare professionals to closely monitor and verify the data being collected by the system.

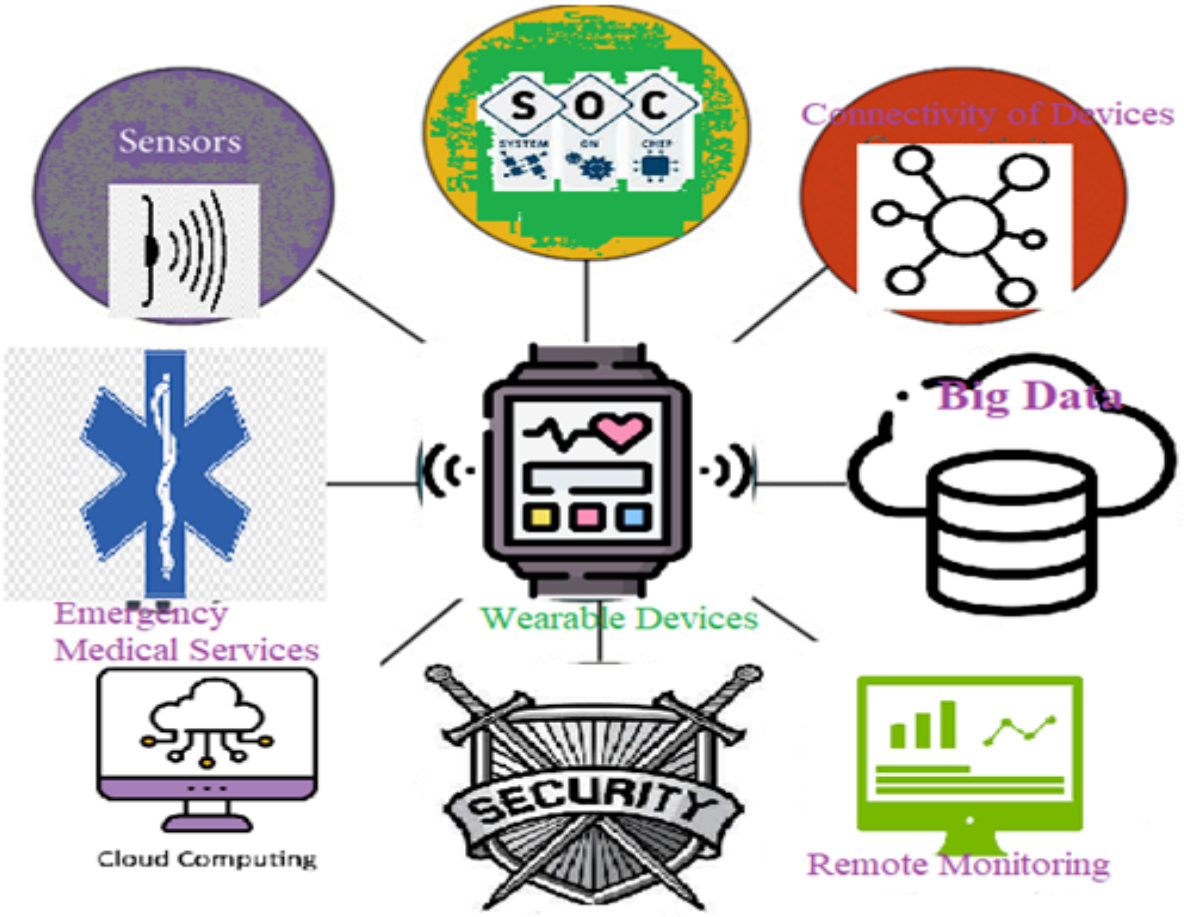
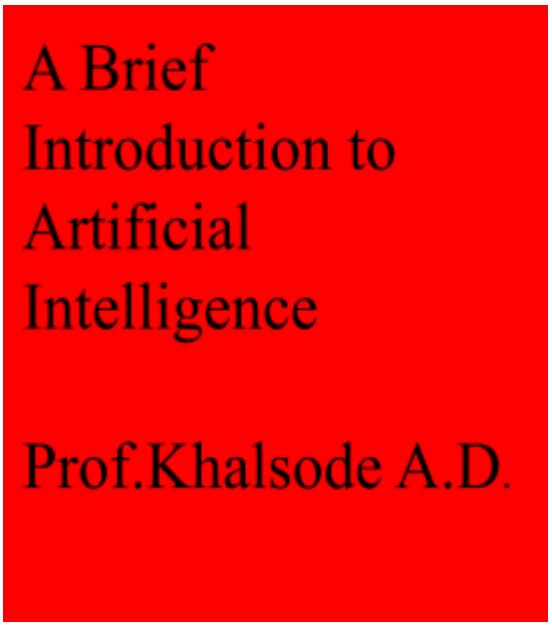


Figure 1- Common elements of IoT-driven smart health care

- Telemedicine systems that are based on IoTs are outfitted with networks of body sensors. They contain gadgets with specialised nodes that detect changes in patient data on a periodic basis. Sensors are utilised to gather information for various ventilation-related measures in order to assess the patients' room circumstances. The sensors are designed to evaluate various temperature,

pressure, humidity, and other important environmental variable data ranges[24].

- These arrangements facilitate remote patient condition monitoring. The technology can keep track of patient histories and deliver information for the hospital on a regular basis. The data can be viewed by hospital professionals, who can also create a treatment strategy for the individual who is being observed. Wireless sensor network-based devices make up the second category of IoT healthcare system equipment[25]. When it comes to the work of managing and monitoring patients in remote areas, the circumstance becomes more complicated than the one described above. IoT is the most affordable and dependable option in some circumstances, but there are more formal objectives that need to be met in order to fully understand how various devices interact with interactive communication systems[26].



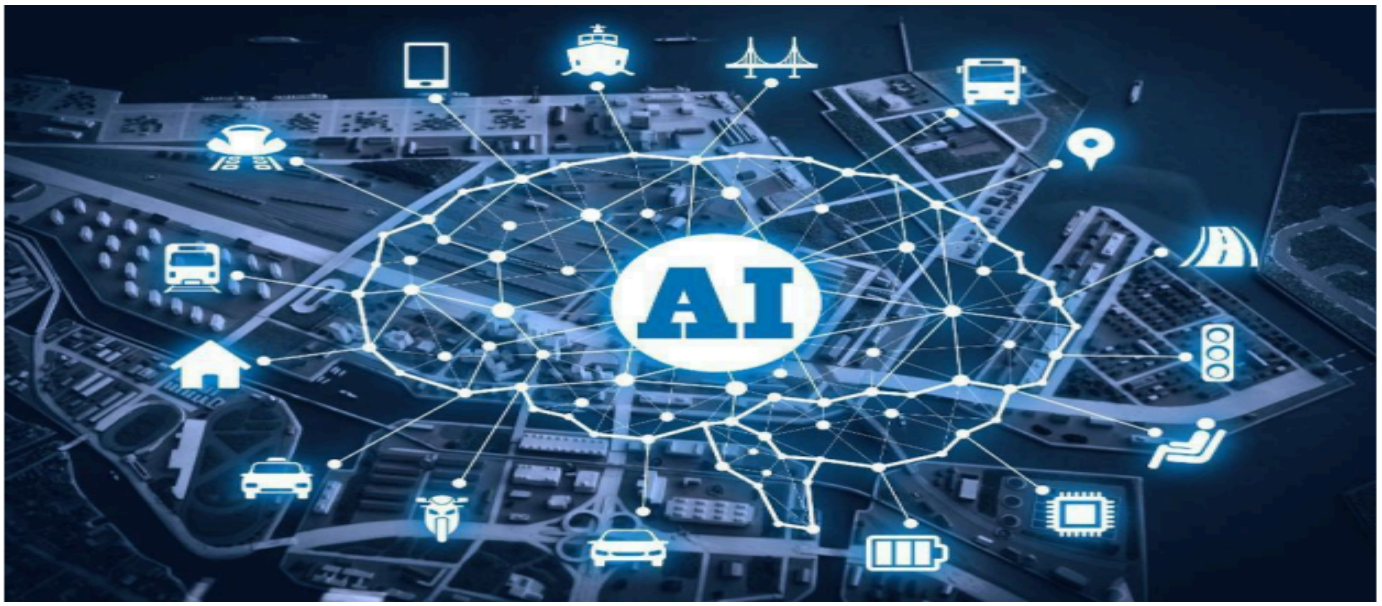
What is Artificial Intelligence?

- Generally speaking, Artificial Intelligence is a computing concept that helps a machine think and solve complex problems as we humans do with our intelligence. For example, we perform a task, make mistakes and learn from our mistakes (At least the wise ones of us do!). Likewise, an AI or Artificial Intelligence is supposed to work on a problem, make some mistakes in solving the problem and learn from the problems in a self-correcting manner as a part of its self-improvement. Or in other words, think of this like playing a game of chess. Every bad move you make reduces your chances of winning the game. So, every time you lose against your friend, you try remembering the moves you made which you shouldn't have and apply that knowledge in your next game and so on. Eventually, you get better and your precision, or in this case probability of

winning or solving a problem improves by a noteworthy extent. AI is programmed to do something similar to that, When we hear the word “Robot”, an image of a metal box with creepy eyes and speaking in a mechanical voice pops into our head. I mean that’s what we have been watching in television for years, isn’t it? And to a certain degree we are right. Traditional robotics has been perceived by pop culture as an arena that creates humanlike machines to work for us as saviours and sometimes as super-villains bringing in a cascade of tyranny into the human world. However, real life robots aren’t as humanlike as we want them to be, yet. They are programmed in a specific way to only execute tasks that it has been programmed to perform. Imagine a self-driving car that has been designed to drive you on its own according to where you instruct it to take you. Now for a traditional robot, the car is going to go through the exact road that it was programmed to select for a certain destination by its creators, possibly without the knowledge of traffic and cause accidents. However, a human driver would have chosen the shortest path or check which paths have the least traffic today and would be the most convenient path for that particular destination. That is the exact humanlike creative thinking the traditional robots lack! They are fixed in their own “not so smart” way and are largely dependent on the program they are built on and the instructions that they are being given. If a certain instruction doesn’t coincide with their program, the robot won’t even be able to run, let alone going the extra step of being creative. This is the limitation of traditional robots Artificial Intelligence is being developed to overcome. Unlike the conventional “bips and bops”, a good AI will simulate the complicated and intuitive sense of thinking and problem-solving abilities of the human mind. A Brief History of AI The concept of Artificial Intelligence is not as modern as we think it is. This traces back to as early as 1950 when Alan Turing invented the Turing test. Then the first chatbot computer program, ELIZA, was created in the 1960s. [1] IBM deep blue was a chess computer made in 1977 beat a world chess champion in two out of six games, one won by the champion and the other three games were draw. [2] In 2011, Siri was announced as a digital assistant by Apple. [3] Elon Musk and some others founded OpenAI in 2015.

- **AI at Work Today** The most common examples of uses of Artificial Intelligence can be found today in smart personal assistants like Apple’s Siri and Amazon’s Alexa. People interact with these devices to command them on a daily basis and these devices use the commands as a part of their dataset to learn from. Another known example of Artificial Intelligence is the use of algorithms in Netflix. Netflix provides very much accurate and relevant suggestions of movies, tv series from our data which is created every time we stream or click on something in Netflix. As the dataset for these systems grows, their accuracy and precision increase as well. Artificial Intelligence is also

viewed as a great tool for better cybersecurity. Many banks are using AI as a means to identify unauthorized credit cards uses. From analyzing complex genetic data to perform the most delicate surgeries at the highest precision is also being worked on to integrate with AI. We all know about companies like Tesla and Apple working to make flawless self-driving cars which is going to have game changing impacts on the future of transportation.It is said that AI is the greatest thing humankind has ever worked on. AI is being used in image and speech recognition and analysis which will be far better than human recognition of image and speech and its application stretches wide and far. There are research and works being conducted using AI that is going to play a very important role in our future healthcare. AI is being worked on to cure Alzheimer's disease and someday even blindness. Someone with dyslexia is being helped to read better with the help of AI. Genetic data is being analyzed by bioinformatics; data science integrated with AI for way better data analysis in healthcare that has not been possible for us in the past. Fields like cancer research and other such diseases are being impacted greatly by advanced applications of AI. AI can be a great tool in the future of education. AI can be used to analyze data from an individual's personal and intellectual needs, capabilities, choices and limitations to develop customized curriculum, strategies and schedules that will be more well suited, appealing and inclusive of most, if not all, children and adults. The uses of AI are also going to change the way we are going to commute in the future. In Addition to self-driving cars, work is being done to manufacture "self-flying" planes and drones that conveniently deliver your food faster and better. One of the biggest concerns about AI is that jobs are being replaced due to automation. However, AI might be creating more jobs than it replaces. This will change the way humans work by creating new types of jobs.



ABSTRACT:

- In today's scenario, technology is improving and enhancing important features in order to meet the needs of commercial and industrial applications. Quantum electronics is also a component of the technology used to develop and create medical devices. Electronic engineering is offering different methods to alter medical care in the age of engineering. Sensors are often employed in the area of medical application to detect and analyse human body illness, and these medical application sensors are developed utilizing electronics engineering. Using medical electronics, surgeons can provide more effective medical therapy and illness assessment. As the population ages, the need for high-quality, low-cost healthcare and medical diagnoses/treatment has risen significantly. Intelligent instruments/clinical devices that cure intractable neurological illnesses or chronic diseases, sophisticated biomimetic devices/systems, artificial organs, and other medical electronics are being created with heterogeneous integration of technology. Medical electronics is a field that straddles engineering, biology, and medicine, and it offers tremendous possibilities for business and new scientific discoveries. There will be two implanted medical electronic systems on display. The subretinal implantation system for visual prosthesis and the close-loop deep brain stimulation (DBS) system for epilepsy are two of the options which have been discussed here.

- An Overview of Medical Electronics

  Prof.Jadhav S.S.

- Medical electronics tools may be used to develop medical equipment and measurement devices, resulting in low-cost medical care. Biometric equipment and artificial organs are being created with the integration of technology to identify and cure chronic illnesses. Medical electronics is a rapidly evolving area of science and technology. The need to offer low-cost medical diagnosis and treatment for a fast growing population is a critical element in medical electronics research and development. Medical electronics are critical to the future development of the electronics sector.

Biosensors, microsystems, integration, and wireless sensor interface are all part of the fundamental framework of a medical technology system. Medical devices, which are developed by medical electronics experts, are used to address health-related problems in medical electronics. Medical electronics engineers are sometimes known as equipment doctors. Multispecialty hospital surgeons or physicians may utilize such instruments and gadgets for analysis [1], [2]. The technology that is developed by medical electronics experts is responsible for the functioning operation and upkeep. Elements of biology and medical science engineering are used to address a variety of health-related issues and measures. Health management, artificial organs, body part replacement systems, instrumentation electronics, delivery care systems, and medical information systems are among the most researched topics[3]. The aging population, high demand for low-cost medical diagnostic and treatment devices/systems, and a rise in unmet clinical requirements are all driving forces in medical electronics research and development [4]. New biomimetic gadgets, systems, instruments, and appliances will be created at the cutting edge of medical electronics to cure intractable neurological illnesses or chronic diseases, restore health, and prolong life. It's an area that will help the electronics industry expand in the future. The exciting possibilities and difficulties of medical electronics have sparked a lot of research in both academia and industry[5]. Microsystems, biomaterials, packaging/integration, and the biotic-abiotic interface are all part of the overall architecture of a medical electronic system. Sensors/actuators, bio-signal processing units, power harvesting and management devices, and RF communication components make up a microsystem. Biomaterials include biocompatibility, biophysics, bio adhesives, and organics. High-density connections, flexible substrates, inert coating, hermetic containers, and thin-film polymers are all needed for packaging and integration. Tissue response, neurology, electrophysiology, cell development, and biomarkers are all linked to the biotic-abiotic interface

- As a result of the current demand for medical electronics, a significant shift in technology is taking place. By using electronics engineering in the area of medical electronics, advancements in medical electronics are offering hand-to-hand medical services. Sensor technologies are coming to medical engineering. Wireless brain sensors, 3-D printing, health wearables, artificial organs, precision medicine, telehealth, robotic surgery, and other innovations resulting from the progress of electronics devices are all beneficial to medical advancement. Medical electronics will offer virtual technologies for diagnosis and therapy in the future years.

Student Article:-

Solar Powered Based Wi-Fi Controlled Display System Using Cell Phone

Ms.Laxmi Jadhav

- **Abstract:**
- A simple solution to the challenge faced by public display systems in remote areas is a “Solar Based Wi-Fi Controlled Display System”. This system operates entirely off-grid using solar panels, eliminating the need of traditional electricity sources. It is integrated with wireless technology, allowing users to update content in real time through Wi-Fi.
- TheSolarBasedWi-Fi ControlledDisplay Systemisaninnovativeapproachtomerging renewable energy with wireless communication technology for public and private display applications. This system utilizes solar energy as its primary powersource, ensuring sustainability and reducing reliance on conventional electricity. AWi-Fi module is integrated into the design, allowing messages to be remotely updated in real time using mobile applications. The system features a dot

matrix display for clear and customizable text or graphical outputs, suitable for advertisements, announcements or personalized messaging. The renewable energy aspect ensures uninterrupted operation evening infrastructure,while the wireless offers convenience and flexibility in managing displayed content. Thisproject demonstrates the feasibility of combining green energy solutions with modern communication systems, promoting energy efficiency, environmental sustainability,and enhanced functionality in display systems for various applications. This eco-friendly and cost-effective solution provides a sustainable and accessible way to manage information displays in areas where grid power and frequent maintenance are impractical.

- **Introduction:**

- "Solar Powered Wi-Fi Control Display System" project is focused on developing a display system powered by solar energy, capable of receiving and displaying real time via WiFi.The integration frenewableenergywith wireless communication offers an energy-efficient, remote-controlled display solution. As non-renewable energy resources are used up with time it is necessary to use renewable energy resources like SolarandWindenergybecauseofitsunlimitedsupply,monetary benefits and environmental friendliness.
- TheSolarBasedWi-FiControlled Display Systems Represents Convergence Of Sustainable energy and modern communication technologies. In an era where digital display sarebe coming essentialforpublicannouncements,advertisements,andpersonalizedmessaging,itisimperativetodevelopsystemsthatarebothenvironmental friendly andtechnologically advanced.
- This project addresses two Critical Challenges:reducing the carbon footprint electronic systems and enhancing ease of content management. By leveraging solar energy as the primary power source, the system minimizes dependence on traditional electricity, promoting sustainability and reducing operational costs. Additionally, the integration of a Wi-Fi module allows for seamless remote control of the display,enabling users to update messages or graphics from a mobile device or computer without the need for physical intervention.To Enhance Functionality, thesystemisequippedwithaWi-Fimodulethatenablesusersto update messages or graphics displayed on a dot matrix screen in real time. Thiseliminatestheneedforphysicalaccesstothe Display,offering convenience and flexibility. The dot matrix display, known for its simplicity and adaptability, ensures clear visibility and customizable content.

Student Department Activities:-

- The Department of Electronics & Telecommunication Engineering conducted various activities for students like Poster Presentation, Electronics Tree making Competition, Craft model making Competition. The objective of the competition was to ignite the fire of imagination and creativity in the students. Activity is a way to communicate research or understanding of a topic in a short and concise format. It helps to improve students' skill, Communication, and ability to express technical views.It helps develop students' ability to communicate perceptively and concisely an important workplace skill.

Poster Presentation Competition

Electronics Tree Making Competition

Editorial

- On the occasion of 76th Republic Day it gives us a great pleasure to present the third edition of Academic Year 2024-2025 of our departmental newsletter TESLA TECH to you which gives us the opportunity to put forth the achievements of our department. In this issue, we have covered different activities carried out at the Department of Electronics & Telecommunication Engineering. We are thankful to all the faculties & students who have contributed to this newsletter. All the events conducted throughout the year were perfectly planned & executed & the overwhelming response it received said it all! I am grateful for all the support "TESLA TECH" has received throughout the year in every possible way from the faculties & Students. I hope the readers of the newsletter have a wonderful reading experience & wish this year's edition to receive your love.

Prof.Khalsode A.D.

Department of Electronics & Telecommunication Engineering,