



VELAMMAL
INSTITUTE OF TECHNOLOGY
Chennai - Kollkata Highway, Panchetti, Ponneri



Department Of Information Technology

QUANTUM
LINK

2023 - 2024



QUANTUM LINK MAGAZINE EDITORIAL MEMBERS

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★ ★ NAVEEN S (IV YEAR)

CO EDITOR

★ ★ SNEHA ASHLEY R K (IV YEAR)

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★ MUNIVEL M (II year IT)

★ NITESH D V (I year IT)

★ JANISH KUMAR U (III year IT)

★ YUVARAJ V (III year IT)

STAFF CO-ORDINATOR

★ ★ ★ Mrs.J MINI



Velammal Institute of Technology



Vision and Mission of Institute

Vision of Institute

To be a leader in imparting quality technical education, research & enterprising skills in pursuit of professional excellence

Mission of Institute

- To promote quality education & technical skills to meet the industry requirements
- To incorporate team work, leadership skills & lifelong learning
- To facilitate career development & higher education assistance
- To encourage innovative ideas for research & development and entrepreneurship for societal needs
- To inculcate ethical responsibility & human values

Velammal Institute of Technology



Vision and Mission of Department

Vision Of Department

To be a center of excellence in the field of Information Technology to solve complex industrial and societal needs.

Mission Of Department

- To impart strong knowledge to students in recent technologies by organizing various technical events.
- To provide platform for the students to encourage creativity, team work, leadership quality and social responsibility.
- To develop the employability and entrepreneurial skills of the students by conducting industry collaborated training.
- To inculcate the importance of research and higher education through awareness programs

Velammal Institute of Technology



Department

PROGRAM EDUCATIONAL OBJECTIVES(PEO'S)

- **PEO-1:** Demonstrate technical competence with analytical and critical thinking to understand and meet the diversified requirements of industry, academia and research.
- **PEO-2:** Exhibit technical leadership, team skills and entrepreneurship skills to provide business solutions to real world problems.
- **PEO-3:** Work in multi-disciplinary industries with social and environmental responsibility, work ethics and adaptability to address complex engineering and social problems.
- **PEO-4:** Pursue lifelong learning, use cutting edge technologies and involve in applied research to design optimal solutions.

PROGRAM SPECIFIC OUTCOMES(PSO'S)

- **PSO1:** Understand, analyze engineering fundamentals, mathematics, database, algorithms, design, analytics and programming skills to develop various computing applications.
- **PSO2:** Apply modern tools and technologies to develop research and innovative solutions to contribute societal and industrial needs.

Chairman Message



Dear Participants and Distinguished Guests,

It gives me immense pleasure to present another edition of Quantum link, the magazine of the Department of Information Technology. This magazine reflects the vision, creativity, and relentless efforts of our students and faculty members.

In today's rapidly evolving technological landscape, learning extends beyond classrooms. Quantum link serves as a platform where students can showcase their technical expertise, creative thinking, leadership, and communication skills. It is heartening to witness their enthusiasm in contributing meaningful articles, innovative ideas, research insights, and creative works.

I congratulate the editorial team for their dedication in bringing out this wonderful edition. I also encourage every student to actively participate in future editions and continue striving for excellence in both academic and extracurricular pursuits.

May Quantum link continue to inspire innovation, knowledge sharing, and lifelong learning. I extend my best wishes to everyone associated with this publication and look forward to its continued success.

Shri.M V Muthuramalingam
Chairman
Velammal Institute of Technology

Director Message



Dear Students, Faculty, and Esteemed Guests,

I am delighted to see the continued growth of Quantum link, a magazine that beautifully represents the academic excellence and innovative spirit of the Department of Information Technology.

This publication showcases the remarkable talents of our students, highlighting their achievements in technical, creative, and co-curricular activities. It serves as a valuable platform for exchanging ideas, promoting research, and encouraging intellectual curiosity.

I appreciate the sincere efforts of the students, faculty members, and editorial team whose dedication has made this edition possible. Their commitment reflects the culture of excellence our institution strives to uphold.

I wish Quantum link greater success in the coming years and hope it continues to motivate students to explore, innovate, and contribute positively to society.

May Quantum link continue to inspire innovation, knowledge sharing, and lifelong learning. I extend my best wishes to everyone associated with this publication and look forward to its continued success.

Shri MVM Sasikumar
Director
Velammal Institute of Technology

Director Message



Dear Students, Faculty, and Honored Guests,

It is with great pleasure that I extend my warm greetings on the release of the latest edition of Quantum link, the Department of Information Technology magazine. This publication stands as a reflection of the talent, innovation, and determination of our students and faculty members.

In today's dynamic technological era, it is essential for students to cultivate not only technical expertise but also creativity, leadership, and effective communication. Quantum link provides an excellent platform for students to share their knowledge, express their ideas, and showcase their accomplishments across a wide range of technical and non-technical fields.

I am delighted to see the enthusiasm and commitment displayed by the students in contributing meaningful articles, research insights, creative works, and innovative ideas. Such initiatives foster a culture of continuous learning, collaboration, and academic excellence.

I sincerely appreciate the efforts of the editorial board, faculty coordinators, and every student contributor whose dedication has made this publication a reality. Their hard work reflects the values of discipline, teamwork, and perseverance that our institution upholds.

Shri S.Santhosh Kumar
Director
Velammal Global Hospital, Chennai

Principal Message



Dear Students and Faculty Members,

It gives me immense pleasure and pride to witness the remarkable journey and continuous growth of our department magazine, Quantum link, over the years. This magazine has become a wonderful platform that reflects the creativity, innovation, and dedication of our students.

I am delighted to see the enthusiastic participation of students in both technical and non-technical domains. Their willingness to explore new ideas, express their thoughts, and showcase their talents is truly commendable. Every article, project, artwork, and achievement featured in this magazine stands as a testament to the hard work and passion of our student community.

A magazine is much more than a collection of pages—it is a reflection of the vibrant culture, values, and aspirations of an institution. Quantum link successfully captures the spirit of learning, collaboration, and excellence that defines our department.

I also extend my sincere appreciation to the editorial team, faculty members, and everyone who worked tirelessly to make this edition a success. Their dedication and commitment deserve heartfelt recognition.

I look forward to seeing Evolve reach even greater heights in the years to come, with richer content, broader participation, and fresh ideas that continue to inspire future generations of students.

I wish the editorial team and all contributors my heartfelt congratulations and best wishes for the continued success of Quantum link.

Dr.N.Balaji
Principal
Velammal Institute of Technology

Vice Principal Message



Dear Students and Esteemed Colleagues,

It is a matter of great pride to witness the continued success of Bytecode, the Department of Information Technology's magazine. This publication reflects the creativity, innovation, and dedication of our students and faculty.

I am pleased to see students actively participating in both technical and non-technical activities, demonstrating their talents beyond academics. Such initiatives help nurture confidence, teamwork, leadership, and critical thinking, which are essential qualities for future professionals.

My sincere appreciation goes to the editorial committee and faculty coordinators for their hard work in producing this excellent edition. I encourage every student to continue contributing with enthusiasm and make Bytecode an even more vibrant platform in the years ahead.

I extend my heartfelt congratulations to everyone involved and wish the magazine continued success.

Dr.S.Soundararajan
Vice Principal
Velammal Institute of Technology

HOD Message



Dear Faculty Members and Respected Participants,

I am delighted to witness the active participation of students in both technical and non-technical domains. Their articles, project ideas, achievements, creative expressions, and innovative thinking truly demonstrate the vibrant learning culture of our department.

Bytecode is more than just a magazine; it is a platform that encourages knowledge sharing, critical thinking, creativity, and collaboration. It inspires students to explore new ideas, develop confidence, and express themselves beyond the boundaries of the classroom.

I extend my heartfelt appreciation to the editorial team, faculty members, and every student contributor for their dedication and hard work in making this edition a success. I encourage all students to continue participating actively and contribute even more enthusiastically in the years to come.

I wish Quantum link continued success and hope it grows into an even stronger platform that celebrates innovation, excellence, and the limitless potential of our students. My best wishes to everyone associated with this wonderful publication.

Dr.P.DEIVENDRAN
Head of the Department
Information Technology
Velammal Institute of Technology

Article



ARTICLE 1

Cybersecurity

Cybersecurity is the practice of protecting networks, systems, devices, and data from unauthorized digital access, cyberattacks, and breaches. It uses various technologies, processes, and etc..



The Rise of Zero Trust Architecture



The traditional "castle-and-moat" security model, where everything inside the corporate network is implicitly trusted, has become dangerously obsolete. For decades, organizations operated on the assumption that a strong firewall could keep threat actors out, and anyone who cleared the perimeter was a verified insider. This model collapsed under the weight of modern IT realities: widespread cloud adoption, a distributed remote workforce, and the ubiquity of mobile and personal devices connecting to corporate resources.

At its core, Zero Trust is not a single product but a strategic security philosophy governed by the principle of "never trust, always verify." In this model, implicit trust is completely eliminated from the digital architecture. No user, device, or application is considered safe by default, regardless of whether they are connecting from the CEO's desk inside the headquarters or from a coffee shop halfway around the world. Every single access request to a network resource must be rigorously authenticated, explicitly authorized, and continuously validated against dynamic, risk-aware policies before a secure connection is granted.

These policies evaluate a multitude of signals, including user identity and role, device health and compliance status, geolocation, time of access, and the data sensitivity classification of the requested asset. A request that passes all checks at one moment might fail seconds later if the user's behavior becomes anomalous or the device's compliance drifts.

ARTICLE 2

Cloud Computing

Cloud computing is the on-demand delivery of computing services—such as servers, storage, databases, networking, and software—over the internet.



The Accelerating Shift to Cloud-Native



The enterprise conversation around cloud computing has fundamentally matured. A decade ago, organizations debated the security and viability of migrating from on-premises data centers to the public cloud. That debate is largely settled, and the focus has pivoted from a simple "lift-and-shift" migration strategy to a far more transformative one: becoming truly cloud-native. Lift-and-shift, which involves moving a virtual machine and its monolithic application directly to a cloud provider's infrastructure

The technological bedrock of the cloud-native model is built on containerization and dynamic orchestration. Unlike bulky virtual machines, containers package an application's code together with its libraries and dependencies into lightweight, portable units that run consistently across any computing environment, from a developer's laptop to a production cluster spanning thousands of machines, where a complex application is decomposed into a suite of small, independent, and loosely coupled services, each responsible for a single

The orchestration layer, overwhelmingly dominated by Kubernetes, automates the deployment, scaling, and management of these containers. If a container crashes, Kubernetes automatically restarts it; if a web service experiences a traffic surge, it instantly spins up additional container instances to meet demand and then scales them back down to save cost. This self-healing and automated scaling is paired with a microservices architecture

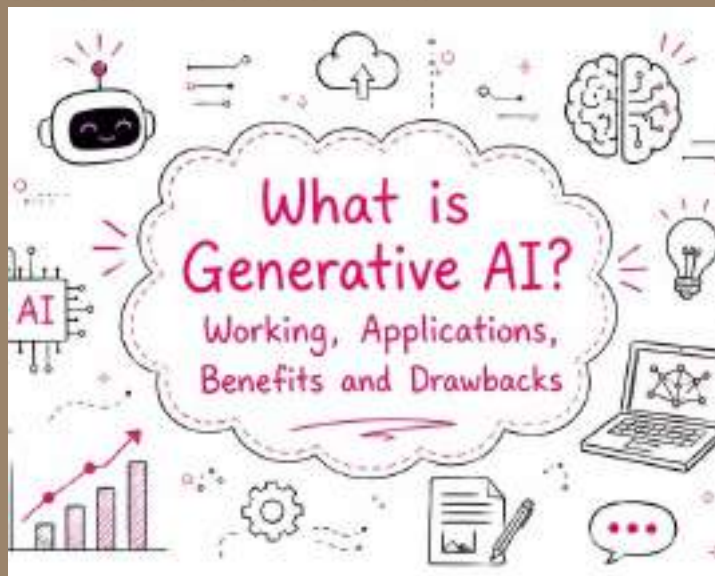
ARTICLE 3

Artificial Intelligence

Artificial intelligence (AI) is the development of computer systems capable of performing tasks that typically require human intelligence.



The Practical Application of Generative AI



Artificial intelligence has been a silent, backend analytical force in enterprise IT for years, powering recommendation engines, fraud detection models, and predictive maintenance systems. The seismic shift in the last few years has been its emergence from the analytical back office into the creative and collaborative front office, driven by the rise of generative AI. Unlike traditional predictive AI that classifies data or forecasts numerical trends, and etc..

The most immediate and transformative impact of generative AI in the enterprise is manifesting in software development and knowledge work. AI-powered coding assistants, integrated directly into development environments, are moving beyond simple autocomplete to become true pair-programming partners. They can generate entire complex functions from a natural language description, explain legacy code no one understands, and automatically create unit tests and documentation.

This dramatically reduces the toil and context-switching that drains developer productivity. In the broader office environment, these models are being embedded as "copilots" into familiar productivity suites. Employees can query a vast, unstructured internal knowledge base through a chat interface, synthesize the key points of a 50-page report into a one-page executive summary, and execute it.

ARTICLE 4

Edge Computing

Edge computing is a distributed IT architecture that processes data near its source (e.g., local servers, IoT sensors) rather than sending all raw data to a centralized cloud.



Redefining Data Processing for a Latency-Sensitive World

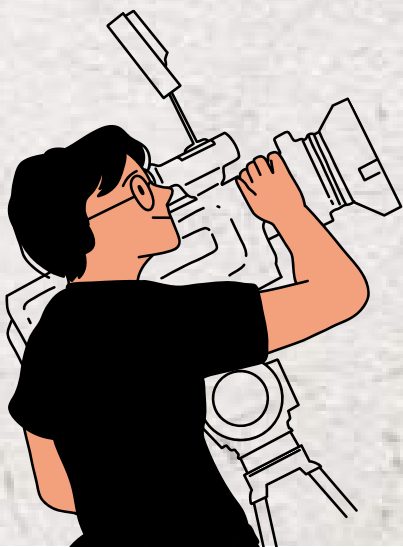
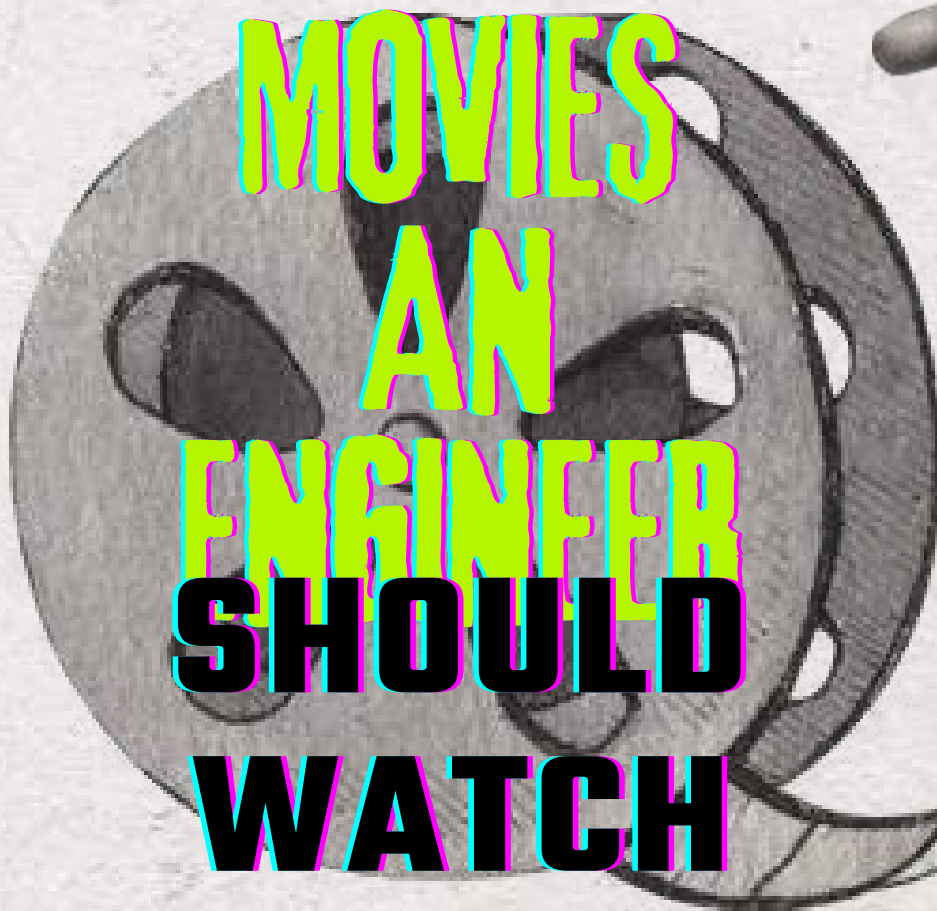
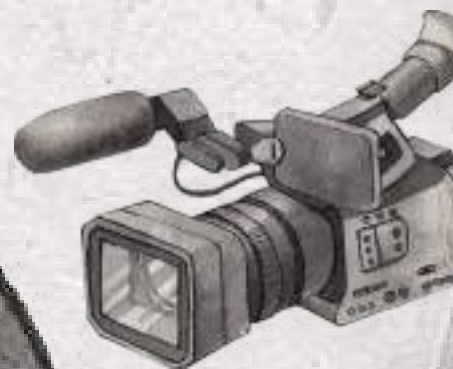


The explosive growth of the Internet of Things (IoT) and intelligent, connected devices is creating a tidal wave of data at the outermost edges of the network. Factories are deploying thousands of vibration, temperature, and optical sensors; retail stores are blanketing floors with cameras and smart shelves; and autonomous vehicles are generating terabytes of real-time telemetry per hour. The traditional cloud-centric computing model, which dictates sending all raw data back to a centralized data center or a remote cloud region for processing, is collapsing under the sheer physics of this data volume

Edge computing creates a strategic data processing continuum that fundamentally alters the relationship between the physical and digital worlds. The edge layer itself is tiered, starting with the "device edge" where an embedded processor on a sensor or a camera runs a lightweight AI inference model to make an instantaneous decision locally. A robotic arm in a factory, for instance, must stop immediately if a safety zone is breached

it cannot afford to ask a cloud server for permission. One step back is the "gateway edge," a more powerful local node that aggregates data from dozens of local devices and performs more complex, near-real-time analysis before sending only critical exceptions or enriched metadata to the cloud. This creates a hierarchy of intelligence: milliseconds matter at the device, seconds matter at the local gateway, and minutes matter at the cloud.

MOVIES
AN
ENGINEER
SHOULD
WATCH



1.PRIMER (2004):

A HIGHLY TECHNICAL, CULT-CLASSIC SCI-FI FILM. WRITTEN AND DIRECTED BY AN ENGINEER, IT EXPLORES THE ACCIDENTAL INVENTION OF TIME TRAVEL WITH INCREDIBLY REALISTIC, COMPLEX DIALOGUE THAT DOESN'T HOLD THE AUDIENCE'S HAND.



**~PUGAZHENDHI S
III YEAR**

2.THE WIND RISES (2013)

A BEAUTIFUL, BIOGRAPHICAL ANIMATED FILM BY HAYAO MIYAZAKI ABOUT JIRO HORIKOSHI, THE AERONAUTICAL ENGINEER WHO DESIGNED THE JAPANESE ZERO FIGHTER AIRCRAFT. IT HIGHLIGHTS THE PASSION, PRECISION, AND HEAVY TOLL OF DESIGNING COMPLEX MACHINERY.



**~SAI ASWIN B.G
I YEAR**

3.DREAM BIG: ENGINEERING OUR WORLD (2017)

AN IMAX DOCUMENTARY THAT HIGHLIGHTS HUMAN INGENUITY AND MASSIVE ENGINEERING MARVELS—LIKE THE WORLD'S TALLEST BRIDGES AND UNDERWATER ROBOTS—AND FOCUSES ON HOW ENGINEERS SHAPE BETTER LIVES



**~MANIMUTHU M
II YEAR**

4.FLASH OF GENIUS (2008)

THE BIOGRAPHICAL DRAMA OF COLLEGE PROFESSOR AND INVENTOR ROBERT KEARNS, DETAILING HIS LEGAL BATTLE AGAINST THE FORD MOTOR COMPANY OVER THE INTERMITTENT WINDSHIELD WIPER.



**~NAVIN KRISHNA K
IV YEAR**

VERSES BY

VOICES

AMIGABLE FUNNY SHY AMABLE
HIJA DE LA LUNA
LOVER OF SOCCER, MUSIC Y ARTE
WHO FEELS LOVED, FELIZ, AND TOLERANT
WHO FEARS WARS, MUERTE AND SPIDERS
WHO WOULD LIKE TO SEE THE OTHER SIDE OF THE WORLD
RESIDENT OF STARS

~PAVAN B
II YEAR

*LET'S RUN AWAY TOGETHER, AWAY FROM CITY LIGHTS,
WHERE NO-ONE KNOWS OUR NAMES YET, AND WE CAN
SEE THE STARS AT NIGHT, WE'LL CAMP OUT IN THE OPEN,
WARMING COLD SKIN BY THE FIRE, TELL EACH OTHER
HOPES AND DREAMS, AND ALL OF OUR DESIRES, WE'LL
OWN NOTHING MORE THAN WE NEED, WATCH SUNRISES
COLOUR THE SKY, LEARN WHAT WE'RE REALLY HERE FOR,
AWAY FROM SOCIETY'S EYES, THIS JOURNEY WILL BE
SCARY, BUT WE'LL LEAVE WITHOUT A PLAN. AND I KNOW
IT WILL BE ALRIGHT, AS LONG AS YOU'RE HOLDING MY
HAND.*

~NAVINKRISHNA K
IV YEAR

இந்த அழகிய உலகில் காதல் மட்டும்தான் அழகு
என்று யார் சொன்னார்கள்?

ஆறு வயது முதல் அறுபது வயது வரை, என் தோளுக்கு
தோளாக நின்று. என்னை தாயாகவும்...
தந்தையாகவும்... ஆசிரியராகவும்... தம்பியாகவும்..
தோழனாகவும்... காவலனாகவும் இருப்பது - அது நட்பு.
என் இறுதி நொடிகளில் எதை மறவேன் என்று
தெரியவில்லை, ஆனால் உங்கள் நினைவுகளும்
நம்முடைய அழகான நாட்களும் என் இதயம்
மறக்காது.

இப்போது நாம் நடக்கும் பாதைகள் வேறாக
இருக்கலாம்... நாம் செல்லும் பயணங்கள்
தொலைவாக இருக்கலாம்... ஆனால் நம்முடைய
பந்தம் தூரத்தால் துண்டிக்கப்படாது;
ஏனெனில் நட்பு என்ற ஒன்று முடிவடைவதில்லை அது
நினைவுகளாக நித்தம் வாழ்கிறது.

அழகாய் தான் அவன் முன் தோன்ற
வேண்டுமென்பதில்லை! அறிவாய் தான்
அவனிடம் பேச வேண்டுமென்பதில்லை! என்
குறைகள் ஏதும் ரகசியம் காக்க
எண்ணியதில்லை! எங்கள் ஸ்பரிசுத்தில்
ஹார்மோன் தலையிட்டதில்லை! பொய்யின்
துணையோ தேவைப்பட்டதேயில்லை!
மொத்தத்தில்,, ஆண் மேலான என்
நம்பிக்கைக்கு ஆரம்பமும் அவனே..!
நினைவுகூற ஆசை கொள்ளும் நாட்களின்
முழுமையும் அவனே..! காமமில்லா காதலை
காண செய்தவன் அவனே..! அவன் என்
காதலன் அல்லன்..!! எனக்கெனவே
நட்பெனும் உறவீன்ற உயிர் அவன்..!!
!!!...என் நண்பன்...!!!

~LOKESH M
IV YEAR

நான் ஓடாத வரை வறுமை என்னை விடவே இல்லை...
நான் ஓடத் தொடங்கிய போதோ, வறுமை அங்கே
நின்று போனதடா!
இதை உணர்ந்து கொண்டால்...
நீயே இந்த மண்ணின் பெரிய புதல்வனடா!"

~SATHISH B
I YEAR

எல்லாக் கடனையும் அடைத்து விட்டேன். நண்பன்
ஒருவன் எனக்காக சிந்திய சில சொட்டு
கண்ணீருக்கு மட்டும் வட்டி ஏறிக்கொண்டே
போகிறது...

~SNEHA ASHLEY R K
IV YEAR





~SRIDHAR B
1 year



~RAJAN S
IV YEAR



~SIVASHAKTHI. S
IV YEAR



Quiz

1.What does the acronym CPU stand for?

- A) Central Processing Unit
- B) Crucial Processing Unit
- C) Critical Processing Unit
- D) Center Processing Unit

2.Which type of memory is volatile and loses its contents when the computer is turned off?

- A) ROM (Read-Only Memory)
- B) Hard Disk Drive
- C) RAM (Random Access Memory)
- D) Flash Drive

3.Which networking device is responsible for connecting different networks together and directing data packets?

- A) Switch
- B) Router
- C) Hub
- D) Network Interface Card (NIC)

4. What is a private computer network designed exclusively for communication and sharing information within an organisation called?

- A) Internet
- B) Extranet
- C) Intranet
- D) Ethernet

5.What type of malware is explicitly designed to hide its presence and maintain privileged, unauthorized access to a system?

- A) Worm
- B) Trojan Horse
- C) Spyware
- D) Rootkit



ABOUT

TECHNOLOGIES

Science & Innovation: Shaping the Future



Science is more than a collection of facts—it is a way of thinking, questioning, and discovering. Innovation transforms those discoveries into practical solutions that improve lives. Together, science and innovation have become the driving force behind the remarkable advancements that define the 21st century. From artificial intelligence and robotics to renewable energy and space exploration, scientific breakthroughs are changing how we live, learn, and communicate. Students today have access to technologies that were once considered science fiction. Smart devices, autonomous vehicles, precision medicine, and satellite technology are all examples of innovation built upon years of scientific research.

Colleges play a vital role in fostering scientific curiosity. Laboratories, innovation clubs, hackathons, research projects, and startup incubation centers encourage students to experiment, solve real-world problems, and transform ideas into impactful solutions. Young innovators are creating sustainable technologies, healthcare solutions, and digital platforms that address global challenges.



Innovation is not limited to laboratories. It begins with curiosity, creativity, and the courage to ask, "What if?" Every great invention—from the internet to life-saving vaccines—started as a simple idea backed by scientific exploration and determination. As students, we have the opportunity to become the next generation of innovators. By embracing science, encouraging research, and developing problem-solving skills, we can contribute to building a smarter, healthier, and more sustainable world.

Sustainability has also become a central focus of scientific innovation. Solar power, wind energy, electric vehicles, biodegradable materials, and smart energy systems are helping reduce environmental impact while promoting a greener future. Innovation is not limited to laboratories. It begins with curiosity, creativity, and the courage to ask, "What if?" Every great invention—from the internet to life-saving vaccines—started as a simple idea backed by scientific exploration and determination.

"Innovation distinguishes those who shape the future from those who simply witness it."

**~SANJAY P
III YEAR**

Transforming Today, Inspiring Tomorrow



Technology has become the foundation of modern society, driving innovation across every aspect of our lives. From the smartphones in our hands to satellites orbiting Earth, technological advancements continue to reshape how we communicate, learn, work, and solve global challenges. One of the most revolutionary technologies of our time is Artificial Intelligence (AI). AI enables machines to learn, analyze data, and make intelligent decisions, powering applications such as virtual assistants, autonomous vehicles, medical diagnostics, and personalized education.

As AI evolves, it is becoming an essential tool for improving efficiency and creating smarter solutions. Robotics is another rapidly advancing field. Robots are now assisting in manufacturing, healthcare, agriculture, disaster response, and even space exploration. They perform tasks with remarkable precision, increasing productivity while reducing risks in hazardous environments.

"Technology is best when it empowers people to create a better future."

**~SANTHOSH T
IV YEAR**



QUIZ ANSWER

1. Correct Answer: A) Central Processing Unit

Explanation: The CPU is often referred to as the "brain" of the computer. It is the primary component that performs most of the processing inside the computer, executing instructions and managing the flow of data.

2. Correct Answer: C) RAM (Random Access Memory)

Explanation: Volatile memory requires power to maintain its data. RAM is used by the computer to hold data that is actively being used or processed. When you turn off the machine, everything stored in RAM is cleared. On the other hand, non-volatile memory like ROM or Hard Drives retains data even without power.

3. Correct Answer: B) Router

Explanation: A router connects distinct networks (like your home network to the internet) and determines the best path for data packets to travel across those networks. In contrast, switches and hubs connect devices within the same local network.

4. Correct Answer: C) Intranet

Explanation: An intranet is a private, internal network restricted to authorized users within a specific organization (like employees). The Internet is public and global, while an Extranet allows controlled private access from the outside (like for trusted clients or vendors).

4. Correct Answer: D) Rootkit

Explanation: The term comes from "root" (the highest privilege level in Unix/Linux systems) and "kit" (the software tools used to implement it). Rootkits actively modify core operating system components to hide themselves, processes, and files, making them exceptionally difficult for traditional antivirus software to detect.

An illustration of three diverse people standing in front of a large blue gear. On the left is a Black man with short yellow hair, wearing a pink shirt and blue shorts. In the center is a woman with black hair and yellow-rimmed glasses, wearing a purple hoodie and orange pants. On the right is a person with pink hair, wearing a pink shirt and orange pants. The background is a light gray, textured surface with some dark, abstract shapes. The text 'THANK YOU' is overlaid in the center in a bold, black, sans-serif font.

**THANK
YOU**