HINDUSTHAN

College of Engineering and Technology

(An Autonomous Institution)

Valley Campus, Pollachi Highway, Coimbatore-641032

www.hicet.ac.in

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PRESENTS

ELECTROZEN'23

VOLUME – 8

A PRIDE OF ECEIANS...

"KEEP GOING- YOU MIGHT BE ALMOST THERE"

HINDUSTHAN COLLEGE OF ENGINEERING AND TECHNOLOGY

"If you Believe it, then your mind can achieve it"

Under the Direction of our beloved Secretary Thirumtathi Saraswathi Kannaiyann and Chairman Thiru T.S.R. Khannaiyann, Hindusthan College of Engineering and Technology was established in the year 2000 with the goal of providing high quality Engineering education at an affordable price.

The All India Council for Technical Education [AICTE] and NAAC have both approved all of the courses offered by our Institution, which is an autonomous entity.

In keeping with its history, HICET has set out on a mission to educate and empower students by producing and spreading pertinent knowledge. Our administration has taken great effort to provide cutting-edge facilities, including labs with the latest technology, spacious classrooms with cutting-edge instructional aids, a lecture hall, a library with an extensive collection, a clean a cafeteria and a secure housing for students from out of town.

HINDUSTHAN COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

VISION OF THE DEPARTMENT: `

- To achieve excellence in Electronics and Communication Engineering keeping pace with evolving technologies through quality education embedded with employability skills and ethical values for the betterment of society.

MISSION OF THE DEPARTMENT:

- **DM1**: To expand the frontiers of knowledge by providing an inspiring and holistic learning environment.
- **DM2**: To develop intellectual skills towards employability by fostering innovation, and creativity in learning.
- **DM3**: To inculcate professional ethics, values and entrepreneurial attitude addressing industrial and societal demands.

PROGRAM EDUCATIONAL OBJECTIVES [PEOs]

PEO 1: To prepare the graduates to solve, analyze and develop real time engineering products by providing strong foundation in the fundamentals of Electronics and Communication Engineering.

PEO 2: To prepare the graduates to succeed in multidisciplinary dimensions by providing adequate trainings and exposure to emerging technologies.

PEO 3: To prepare the graduates to become a successful leader and innovator following ethics with the sense of social responsibility for providing engineering solutions.

PROGRAM SPECIFIC OUTCOMES [PSOs]

- Graduates will be able to analyze, design and develop solutions for real-time challenges, facilitating the creation of quality products in the Electronics and Communication industry.
- Graduates will exhibit resilience in embracing emerging technologies, nurturing innovation in signal processing, communication systems, Embedded systems, IoT, Networking and VLSI to address contemporary demands.

CHIEF EXECUTIVE OFFICER'S DESK

I'm pleased to give you the Eighth Volume of the Departmental Annual Magazine for the Department of ECE for 2023. College publications have a lot to teach. They inspire pupils to write and reflect. Fresh talent often receives its initial exposure through this channel. Additionally, it motivates the following batches to accomplish more. The magazine also documents the Institution's accomplishments and numerous activities. I sincerely hope that this article will be productive in fulfilling this goal. Congratulations to the editing team for their role in producing this great piece of effort.

DR. K. KARUNAKARAN

CEO

PRINCIPAL'S DESK

It makes me extremely happy to see that the publication of Magazine (ELECTROZEN'23) Volume VIII by the Department of ECE has received praise. Applause for the editorial staff. Students and instructors working together enhance an Institution's grandeur and dignity. This Magazine has done an excellent job of showcasing an Institution's strengths by showing the talent of staff members and students as well as their original thoughts and creative abilities.

I salute the achievement of this goal

DR. J. JAYA

PRINCIPAL

HOD'S DESK

"EDUCATION'S PURPOSE IS TO REPLACE AN EMPTY MIND WITH AN OPEN ONE"

The Department of Electronics and Communication pledges to operate with a balance of technological, managerial levels, social, and professional competence. The department gives special attention to all vital facets of sound effectiveness, internal improvement, and social and intellectual development. All of these stories about how our Department and the Institute help our young brains and ignite practical brilliance by guiding them appropriately towards their areas of greatest interest are embedded in the pages of the college Magazine.

I offer my congratulations to the group of pupils and instructors. I hope that the upcoming student era will continue an effective history of periodic Magazine launches.

DR. P. VIJAYALAKSHMI

HOD, ECE

CONTENTS


ARTICLE

6G NETWORKS

6G, the anticipated sixth-generation wireless technology, represents the next frontier in mobile communication systems. Building upon the foundation laid by its predecessor, 5G, 6G aims to revolutionize the way we connect and communicate. Envisioned features include unprecedented data speeds, potentially reaching terabits per second, and ultra-low latency in the sub-millisecond range. This transformative technology is expected to enable applications that were previously unimaginable, from seamless augmented and virtual reality experiences to ultra- responsive, real-time critical systems. To achieve these ambitious goals, 6G may employ advanced spectrum usage, harnessing higher frequencies like millimeter-wave and terahertz bands.

VIGNESH BASKAR V

20106024 III ECE A

ARTIFICIAL INTELLIGENCE (AI)

Artificial intelligence (AI) is a revolutionary field of computer science that aims to create intelligent machines capable of simulating human-like cognitive abilities. At this core, AI seeks to develop algorithms and systems that can perceive, reason, learn, and solve problems autonomously, withoutexplicit human intervention. This technology has the potential to transform almost every aspect of ourlives, from enhancing productivity in various industries to revolutionizing healthcare, transportation, and entertainment. Machine learning, a subset of AI, enables systems to improve their performance over time through exposure to data, unlocking the power of predictive analytics and pattern recognition. As AI advances, ethical considerations become increasingly important, raising questions about privacy, bias, and responsible development. Despite the challenges, the potential benefits of AI are immense, holding the promise of driving innovation and shaping a future where intelligent machines collaborate with humans to create a more efficient, equitable, and sustainable world 5G network.

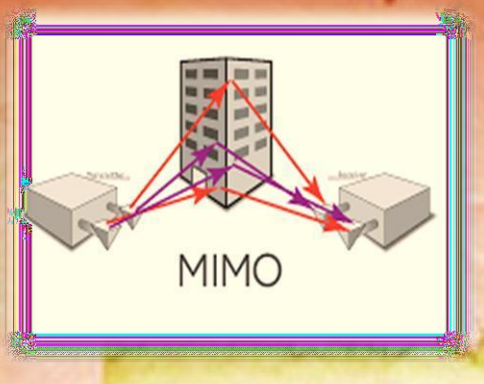
MIRTHULA T
20106075 III ECE B

SMART AND AUTONOMOUS SYSTEMS

Smart And Autonomous Systems Technology represents a ground breaking advancement in various fields, ushering a new era of innovation and efficiency. In industries like manufacturing, smart systems automate complex tasks, improving productivity, and quality while reducinghuman error. In transportation, autonomous vehicles holdthe potential to revolutionize mobility, enhancing safety and reducing traffic congestion. Smart Homes equipped with connected devices allow for seamless control and optimization of various appliances, lighting, and security systems, improving energy efficiencyand enhancing convenience. In healthcare, autonomous robotic systems assist in surgeries and medical procedures, contributing to better patient outcomes. However, as smart and autonomous systems continue to evolve, ethical considerations and safety measures become critical, ensuring these technologies are deployed responsibly and with appropriate safeguards. With ongoing research and development, smart and autonomous systems technology has the capacity to reshape industries and transform daily life, promising a future where intelligent machines work collaboratively with humans to achieve new heights of progress and well-being.

MANIKANDAN S

20106073, III ECE B



MIMO ANTENNA

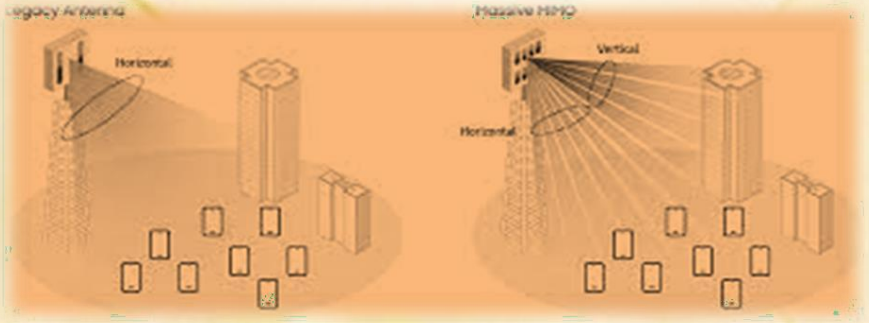
MIMO, which stands for MULTIPLE-INPUT MULTIPLE-OUTPUT, is a cutting-edge wireless Communication technology that has significantly enhanced the performance and capacity of modern wireless networks. Unlike traditional communication systems that use single antennas for transmitting and receiving data, MIMO employs multiple antennas at both the transmitter and receiver ends. This innovative technique takes advantage of multipath propagation, where signals bounce off obstacles and arrive at the receiver from different paths. By utilizing spatial diversity and signal processing algorithms, MIMO can increase data throughput, improve reliability, and reduce interference in wireless communication. It allows for simultaneous transmission of multiple data streams over the same frequency, boosting overall networkcapacity and efficiency. MIMO technology has been widely adopted in various wireless communication standards, such as 4G LTE and wi-fi, and continues to play a vital role in the evolution of 5G and beyond. Its ability to exploit the spatial domain to improve communication performance makes MIMO a key enabler for delivering high-speed, reliable, and seamlessconnectivity in today's interconnected world.

`Thanaveer Kowshik
20106034 III ECE A

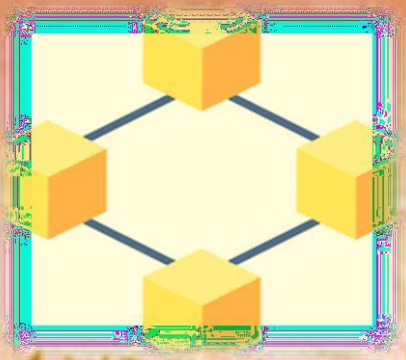
MASSIVE MIMO ANTENNA

MASSIVE MIMO, represents a significant advancement in wireless communication technology. It is an extension of the MIMO concept that takes the use of multiple antennas to a whole new level. In MASSIVE MIMO systems, a base station is equipped with a massive number of antennas, often ranging from dozens to hundreds. These antennas work in synchrony to serve multiple users simultaneously by transmitting multiple data streams in the same time-frequency resources. As a result, MASSIVE MIMO dramatically improves the capacity and coverage of wireless networks, offering unparalleled data rates and enhancing overall network performance.

Additionally, MASSIVE MIMO'S ability to reduce interference and support a large number of users makes it a crucial technology for 5G and future. 6G networks, enabling the seamless and reliable connectivity needed for the growing demand in data-intensive applications and the Internet of Things (IOT)



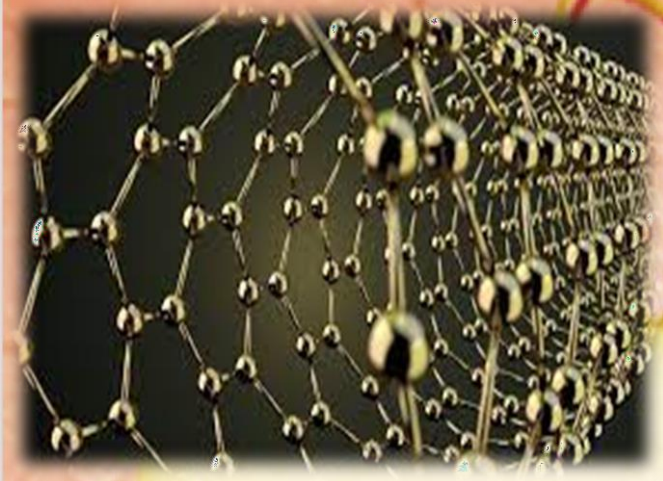
SANTHIYA CHRISTIE AP/ECE



BLOCKCHAIN

Blockchain is a revolutionary technology that has gained widespread attention for its potential to transform variousindustries. At its core, a blockchain is a decentralized and distributed digital ledger that records transactions across multiple computers, known as nodes, in a secure and transparent manner. Each block inthe chain contains a group of transactions, and once a block is added, it becomes immutable, meaning it cannot be altered retroactively without altering subsequent blocks, making the data tamper- resistant and trustworthy. One of the key features of blockchain is its decentralized nature, which removes the need for a central authority to validate transactions, reducing the risk of fraud and enhancing data integrity. Blockchainhas found applications in diverse fields, ranging from financial services with crypto currencies like bitcoin, to supply chain management, healthcare, voting systems, and more. Smart contracts, which are self- executing agreements with predefined conditions,further extend the capabilities of blockchain by automating processes and reducing the need for intermediaries.

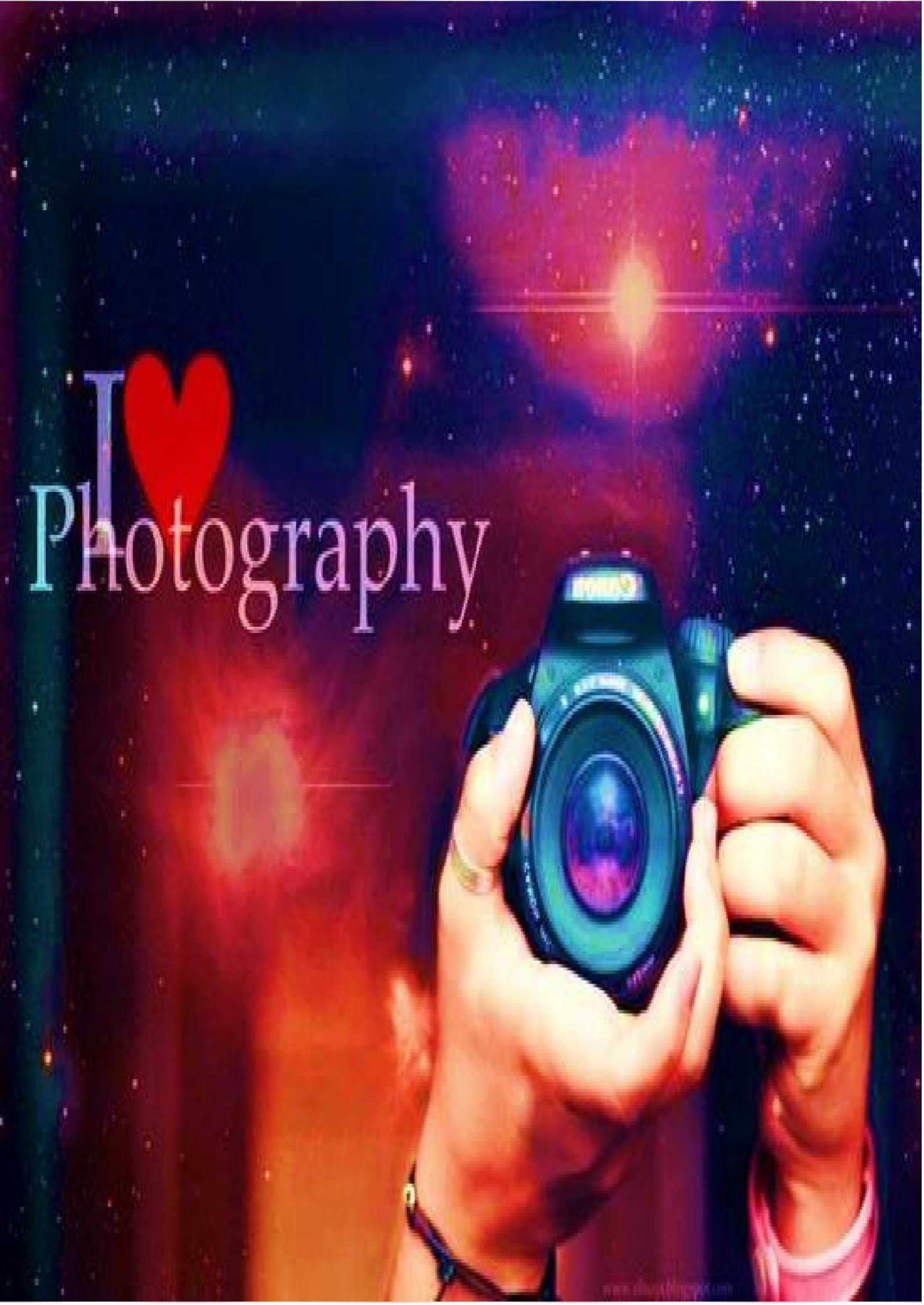
Vignesh Bhaskar
20106024 III ECE A`

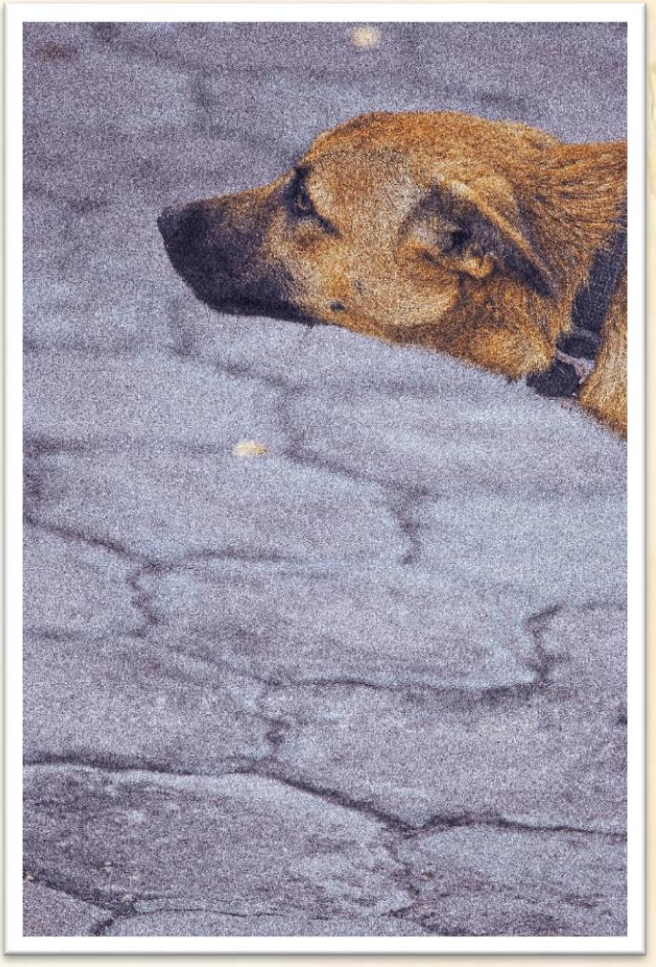


NANOELECTRONICS

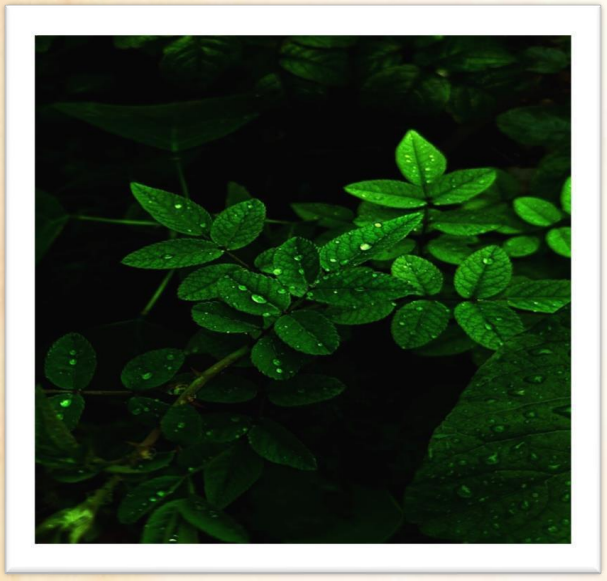
Nanoelectronics is an exciting and rapidly evolving field of electronics that deals with the study and application of devices and materials at the Nanoscale. Nanoelectronics has opened up new frontiers for creating electronic components and devices with enhanced properties, improved performance, and novel functionalities. One of the critical aspects of nanoelectronics is the development of nanoscale transistors, the fundamental building blocks of modern electronic circuits. Additionally, quantum nanoelectronics explores the potential of exploiting quantum phenomena to build quantum computers and quantum communication systems that promise unprecedented computational power and secure communication. As nanoelectronics continues to advance, it holds the potential to revolutionize various industries, from computing and telecommunications to healthcare and renewable energy, propelling us into future defined by cutting-edge technology and innovation.

MIRTHULA T
20106075 III ECE B


I
Photography



KAVIN S
20106063 III ECE B



SANTHIYA CHRISTIE J

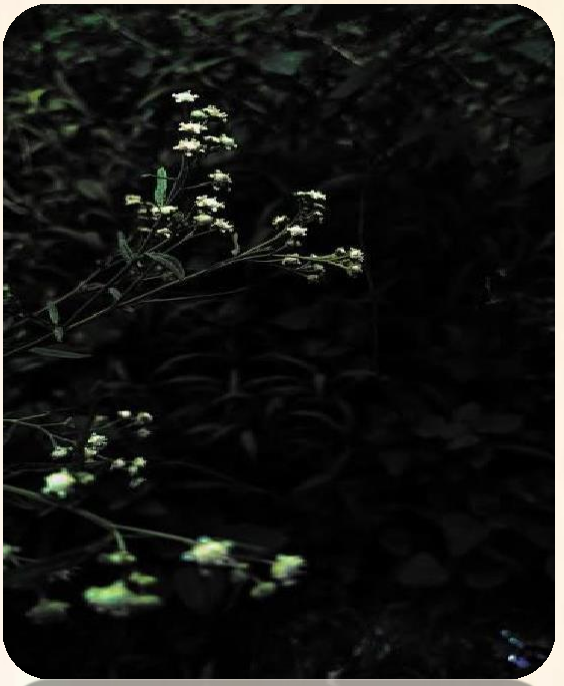
AP/ECE

JANINE ROHAN

20106011 III ECE A

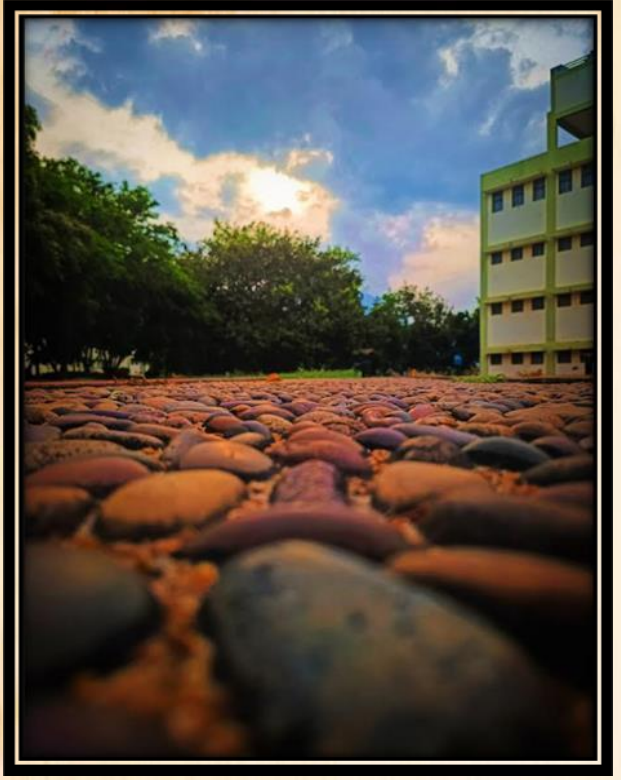
HARI VIGNESH S

19106039IV ECE A



PRAVEEN KUMAR

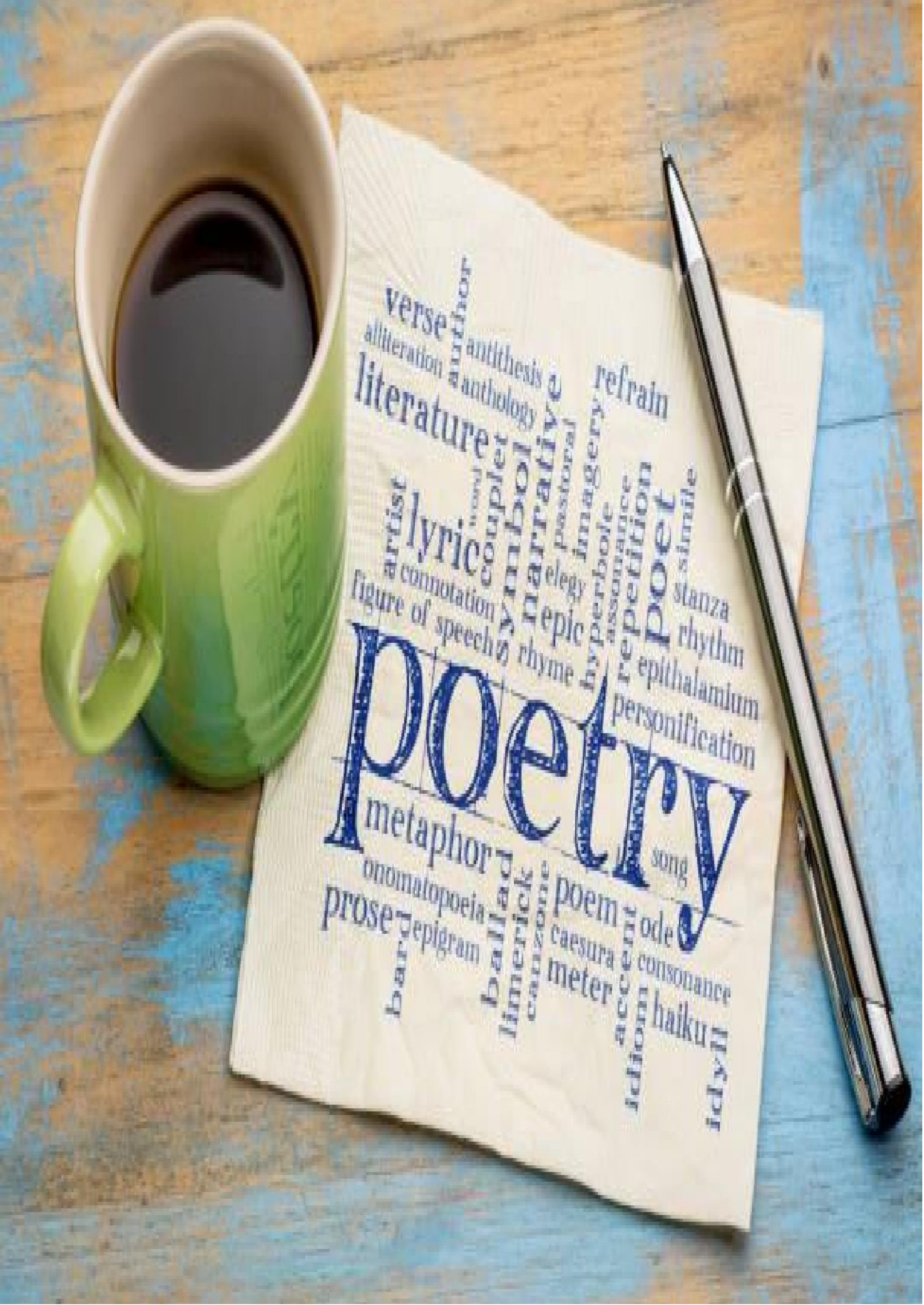
19106086 IV ECE B



JONES STEVE WALKER

19106048 IV ECE B

KAVIN S
20106063 III ECE B


poetry
verse
author
alliteration
antithesis
literature
anthology
refrain
narrative
pastoral
imagery
lyric
artist
couplet
symbol
connotation
figure of speech
elegy
epic
rhyme
hyperbole
assonance
repetition
poet
simile
stanza
rhythm
epithalamium
personification
metaphor
song
onomatopoeia
prose
epigram
bard
ballad
limerick
canzone
poem
caesura
meter
accent
idiom
ode
consonance
haiku
idyll

நிலா

மாயரின் பொன் காந்தி

பறவைகள் பறந்து சென்றது நிலத்தின் மேலே, மாயர் பொன் காந்தி மறைந்து விட்டது திரும்பினது தான். பல கனியும் போய் பின் நின்று மாறுகின்றன, புல்லாங்குழல் போன்று மிகுந்த சுவர் அமைந்து சிகின்றது.

சில நேரங்கள் அமர்ந்து விட்டன, சில நேரங்கள் கிளைஞர் போன்று திகின்றன, ஆனால் அவனுக்கு ஏன் அத்துவிதம் செய்தது என்று தெளிவு சொல்லவில்லை.

மாலை இடிந்து நின்று பார்க்கும் மாசிலாக, மிகுந்த காந்தி தான் மாண்டு நின்று கிளக்கின்றான். காற்று மிதிந்து புதிய நிலத்தின் பக்கம் அணைந்து காட்டினான், அது மாயருக்கு அரிது அலையிலும் அழகு தரும்.

பல நிலங்கள் வந்து அங்கு நின்று காட்டினால், அந்த நிலத்தில் என்னை காண்பதெங்கு என்று அறிய முடியாது. அந்த மாயர் பொன் காந்தி என் கண்களின் முன்னுக்கு வந்தால், அது என் உள்ளத்தின் செருக்கு மூலம் விளங்கும்.

மாயருக்குக் கொடுக்க நினைத்தது என் தலைமையின் மேல், அந்த நிலத்தில் இருந்து வந்த அழகு அனைவருக்கும் அரிது. ஆனால் நான் அந்த அழகின் சொரூபத்தின் மேல் நினைத்தது, என் மனதில் அந்த மாயரின் பொன் காந்தியின் மேல் நினைக்கும்.

RAGHUL

720721106087 II ECE B

IN THE WARMTH OF HER EMBRACE, LOVE UNFURLED, A GUIDING LIGHT THROUGH LIFE'S EVERY WHIRL, HER TENDER TOUCH, A SOOTHING BALM, A BEACON OF STRENGTH, A HEALING CALM.

IN THE DARKEST HOURS, SHE'S A RAY OF SUN, A ROCK TOLEAN ON WHEN THE JOURNEY'S BEGUN, WITH ARMS OUTSTRETCHED AND HEART SO KIND, A MOTHER'S LOVE, AN ETERNAL BIND.

HER SACRIFICES, A SILENT ART, SHE WEAVES A TAPESTRY, AWORK OF HEART, THROUGH LAUGHTER AND TEARS, SHE STANDS BY, A LOVE THAT NEVER QUESTIONS WHY.

HER GENTLE WORDS, A LULLABY'S GRACE, SHE WIPES AWAY TEARS, KISSES EVERY TRACE, IN HER EYES, YOU FIND SOLACEAND CARE, A LOVE SO PURE, BEYOND COMPARE.

WITH EVERY STEP, SHE WALKS BESIDE, IN JOY AND SORROW,HER LOVE WON'T HIDE, HER WISDOM A COMPASS, HER VOICE A GUIDE, IN HER EMBRACE, FEARS SUBSIDE.

A MOTHER'S LOVE, AN ENDLESS SEA, A LOVE THAT NURTURES AND SETS US FREE, IN HER PRESENCE, WE FIND OUR WORTH,A LOVE THAT SPANS BOTH HEAVEN AND EARTH.

SO, LET'S CHERISH THE GIFT SHE IMPARTS, A MOTHER'S LOVE,THE CORE OF OUR HEARTS, IN EVERY BEAT, HER LOVE WILL RESIDE, A PRECIOUS BOND THAT WILL NEVER DIVIDE.

GOWTHAMAN R
19106035, IV ECE A

My Classroom

THE TEACHER STANDS, A GUIDING STAR, IGNITING FLAMES OFLEARNING AFAR, WITH PASSION'S FIRE, THEY SOW THE SEEDS, OF GROWTH AND WISDOM, THE SOUL'S NEEDS.

DESKS AND CHAIRS, A CHORUS OF UNITY, WHERE FRIENDSHIPS BLOOM, AND BONDS FIND AFFINITY, LAUGHTERECHOES, LIKE BIRDS IN THE SKY, AS LESSONS UNFOLD, MINDS LEARN TO FLY.

BOOKS UNFURL THEIR SECRETS, PAGE BY PAGE, UNLOCKING WONDERS FROM EVERY AGE, INQUISITIVE EYES, LIKE STARSTHAT GLEAM, UNRAVELING MYSTERIES, LIKE A VIBRANT DREAM.

THE BLACKBOARD, A THEATER OF THOUGHT, WHERE IDEAS DANCE AND KNOWLEDGE IS SOUGHT, CHALK WHISPERS WISDOM IN LINES AND CURVES, AS YOUNG MINDS EXPANDWITH EACH WORD IT SERVES.

WITH PENCILS AND PENS, THOUGHTS TAKE FLIGHT, ONBLANK PAGES, DREAMS IGNITE, IMAGINATION'S PLAYGROUND,WIDE AND FREE, IN THE CLASSROOM'S HEART,WHERE FUTURES DECREE.

IN EVERY CORNER, A STORY TO TELL, OF TRIUMPHS AND STRUGGLES, WHERE SPIRITS DWELL, FOR IN THESE WALLS,LIFE'S TAPESTRY WEAVES, A SYMPHONY OF LEARNING, WHERE HOPE ACHIEVES.

KOTA HARISH SRI RAGHAVENDRA

19106059, IV ECE B

UPON THE VELVET CANVAS OF THE NIGHT, THE STARS EMERGE, A CELESTIAL SIGHT, TWINKLING DIAMONDS, A COSMIC ART, A TAPESTRY OF WONDER, IN EVERY PART.

LIKE DISTANT DREAMS, THEY SHIMMER AND GLEAM, IN THE VAST EXPANSE, THEY FORM A TEAM, GUIDING LOST SOULS WITH THEIR ANCIENT LIGHT, A BEACON OF HOPE IN THE DARKEST NIGHT.

EACH STAR A STORY, BURNING BRIGHT, IN THE SYMPHONY OF THE COSMIC FLIGHT, CLUSTERS AND CONSTELLATIONS, THEY ALIGN, A MAP OF THE HEAVENS, SO DIVINE.

AS NIGHT DESCENDS, THEY STEAL THE SHOW, A GALAXY'S BALLET, A COSMIC FLOW, IN THEIR SILENT DANCE, THEY SHARE THEIR GRACE, A REMINDER OF THE INFINITE SPACE.

THROUGH EONS THEY'VE TRAVELED, A TIMELESS SPREE, WITNESSING THE BIRTH OF HISTORY, THEIR DISTANT GAZE, A GLIMPSE PROFOUND, OF WORLDS UNSEEN, OF SIGHTS UNBOUND.

OH, STARS, YOU HOLD THE MYSTERIES UNTOLD, IN YOUR DISTANT REALMS, STORIES UNFOLD, WE LOOK UP, FILLED WITHAWE AND GLEE, HUMBLED BY THE VASTNESS THAT WE SEE.

SO, IN THE QUIET OF THE NIGHT'S EMBRACE, LET'S MARVEL AT THE STARS' ETERNAL GRACE, FOR IN THEIR LIGHT, WE FIND OUR WAY, IN THEIR BRILLIANCE, WE SEEK TO STAY.

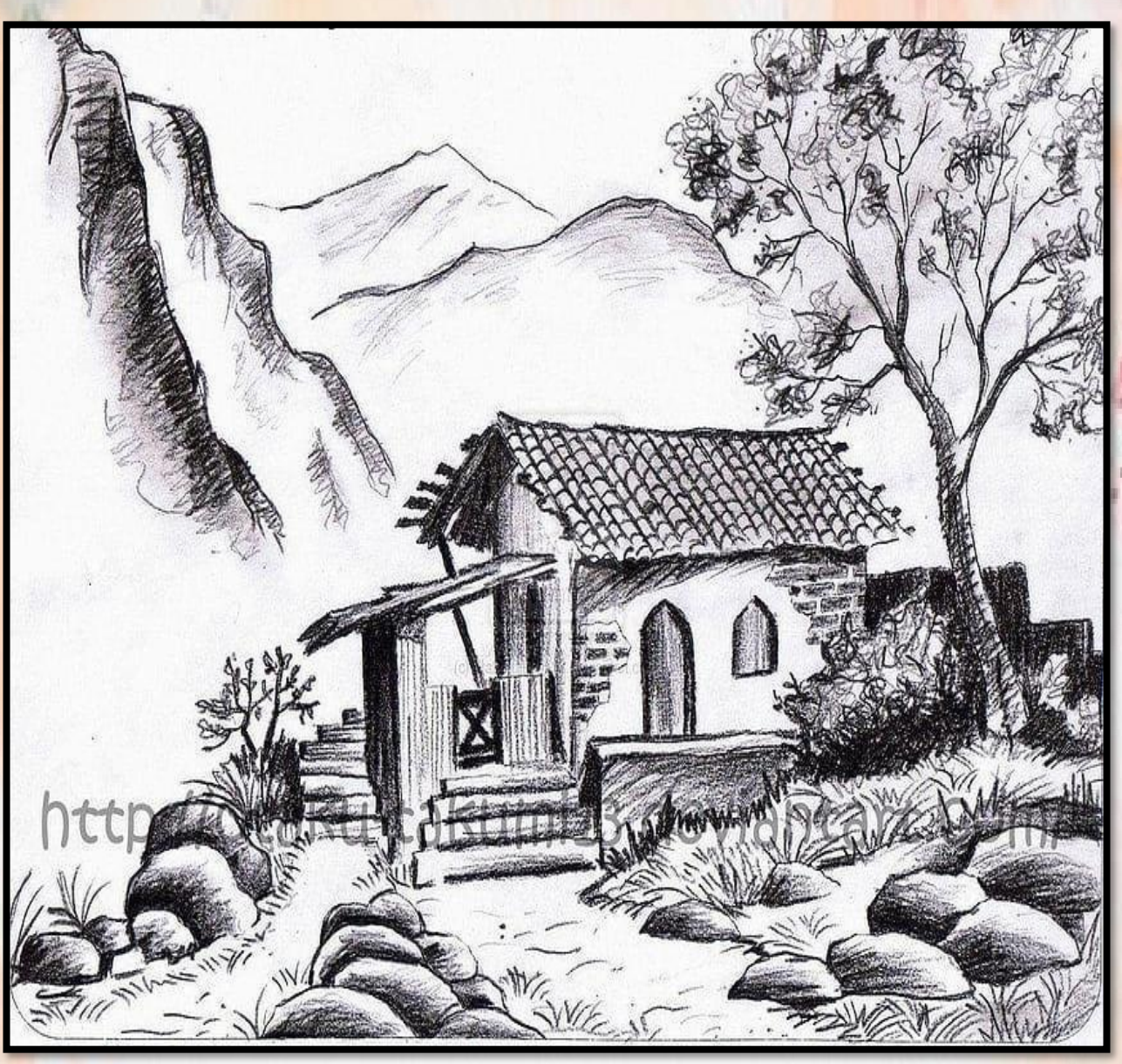
MANIKANDAN S

20106073, III ECE B


Art

RIFHATH RIZAN

19106096 IV ECE C



PALEPU JANAKIRAM

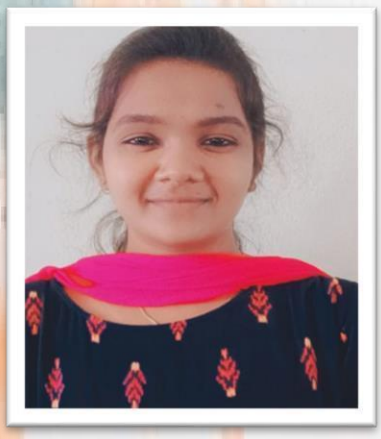
19106081, IV ECE B

HARISH

20106009, III ECE A

RAGHUL

720721106087 II ECE B



SURUTHI

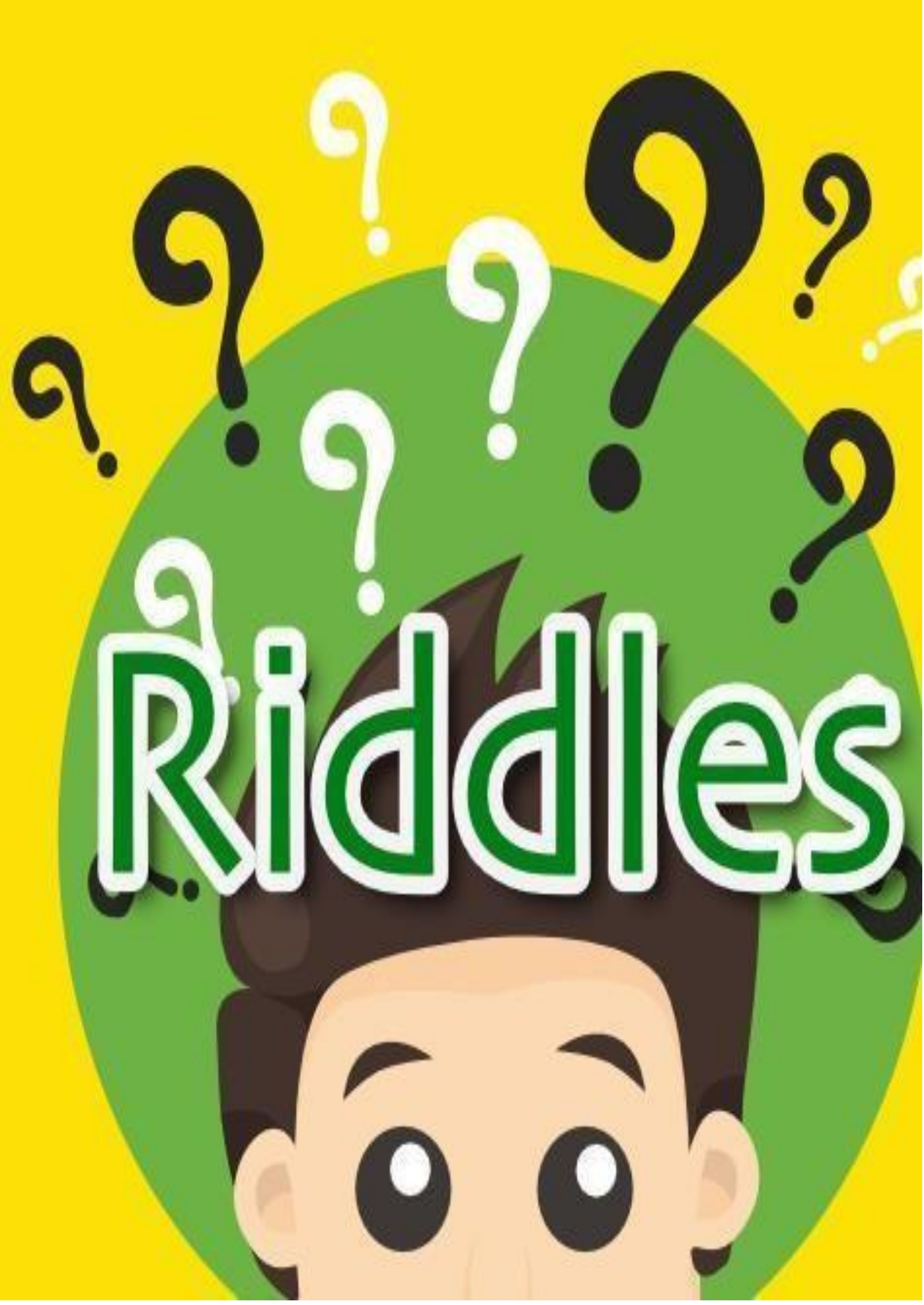
720721106111 II ECE B

VAISHNAVI S

720721106117 II ECE B

SURUTHI

720721106111 II ECE B


Riddles

TECHNICAL RIDDLES

1. The more you code, the more of me there is. I may be gone for nowbut you can't get rid of me forever. What am I?

   Answer : **A bug**

2. I'm a language for everything yet I have no real identity of my own. Good luck trying compile me. What am I?

   Answer : **Pseudocode**

3. As a developer , you usually get mad at me because I complain a lot, although I'm usually right. What am I?

   Answer : **A Compiler**

4. I'm sent before I'm ready. I'll break before you know it and you can't find me in many places. What am I?

   Answer : **A Beta release**

5. I'm a single thing, nothing special. While I have many cousins were all very similar because we set your project up. What am I?

   Answer : **A Configuration file**

6. You make me often and your always messing with me by pushing and pulling me all the time. Don't you have any manners, What am I?

   Answer : **Code**

7. I’m a shape shifter. You could call me someone who could posses multiple qualities but only has one set of them at any given time. What am I?

   Answer : **Polymorphism**

8. I’m your “Waiter” for information. What am I?

   Answer : **A Server**

9. I have a pulse but no heart, a brain but can’t think and while I can sleep. I usually don’t stay asleep for long? What am I?

   Answer : **A CPU**

10. How many trailing zeros are in the number 5?

   Answer : **1**

11. Why did the spider get a job in I.T.?

   Answer : **He was a great web designer**

12. What invention lets you look right through a wall?

   Answer : **A window**

NON – TECHNICAL RIDDLES

1. I catch you and your teammates when you fall and I can be you in a pinch. What am I?

   Answer : **Project Manager**

2. I'm the rare case when today comes before yesterday. What am I?

   Answer : **Dictionary**

3. What goes all the way around the world but stays in a corner?

   Answer : **A Stamp**

4. You cannot keep me until you have given me. What am I?

   Answer : **Your Word**

5. What has four fingers and a thumb, but isn't alive?

   Answer : **A Glove**

6. If you have me, you will want to share me. If you share me, you will no longer have me. What am I?

   Answer : **A Secret**

7. What gets wet when drying**?**

   Answer : **A towel**

8. What two words, added together, contain the most letters?

   Answer : **Post office**

9. What comes once in a minute, twice in a moment, but never in a

thousand letters?

Answer : **The letter M**

10. What has a head and a tail, but no body?

Answer : **A coin**

11. The man who invented it doesn’t need it. The man who bought it doesn’t want it. The man who needs it doesn’t know. What is it?

Answer : **A coffin**

12. You see a boat filled with people, yet there isn’t a single person on board. How is that possible?

Answer : **Everyone is married**.

ABOUT THE DEPARTMENT

The Department of Electronics and Communication Engineering came into existence in the year 2000. The Department has a UG programme, B.E- Electronics and Communication Engineering with current intake of 120 and 2 PG programmes, M.E-Communication Systems and M.E-Applied Electronics to offer high class technical education to the students. The Department promotes doctoral programme and research work. The department is recognised as Research Centre by Anna University for offering Ph.D programme in Information and Communication Engineering. The Programme is accredited both by NAAC and NBA. The department has received research grants from various Govt. funding agencies like AICTE, ISRO, CSIR, IEI, TNSCST, IEEE(M) to improve the skill set of the students in thrust areas and make them industry ready. The department in association with IBM offers industry integrated courses in IoT domain. The Choice Based Credit System (CBCS) curriculum offered includes a widespread of domains like Professional Core, Industry- Integrated Courses, Life skill Courses, Soft skills and Design thinking and Employment Enhancement Courses. The department offers Choice Minor, Honors, and Honors Degree with Specialization. The department has signed MOUs with more than 10 Industries like Intel, Texas Instruments, Hero Tessolve Semiconductors and has established "Centre of Excellence Laboratory in Embedded and IoT". Our mission is to develop the students in multidisciplinary dimensions by offering Value Added Courses in various current technologies like Artificial Intelligence, IoT, VLSI, Embedded Systems and etc. The students are also supported with Internship opportunities and Industry oriented projects during their eighth semester of study. Various Clubs are functional in the department to express the technical and non-technical skill of the student. Department ensures the Placement opportunity for every deserving student. Best destination to choose quality technical Education in Communication Engineering.

MAGAZINE CHIEF EDITOR

Dr. P. Vijayalakshmi/ECE

EDITOR

Ms. SANTHIYA CHRISTIE J AP/ECE

STUDENT EDITORS

JENIFER - II ECE A

JANANI - II ECE A

BHAVYAKRISHNAN - II ECE A

KATHIRVEL - II ECE A

DHAYANAND - II ECE A

VAISHNAVI S - II ECE B