



Vel Tech
Rangarajan Dr. Sagunthala
R&D Institute of Science and Technology
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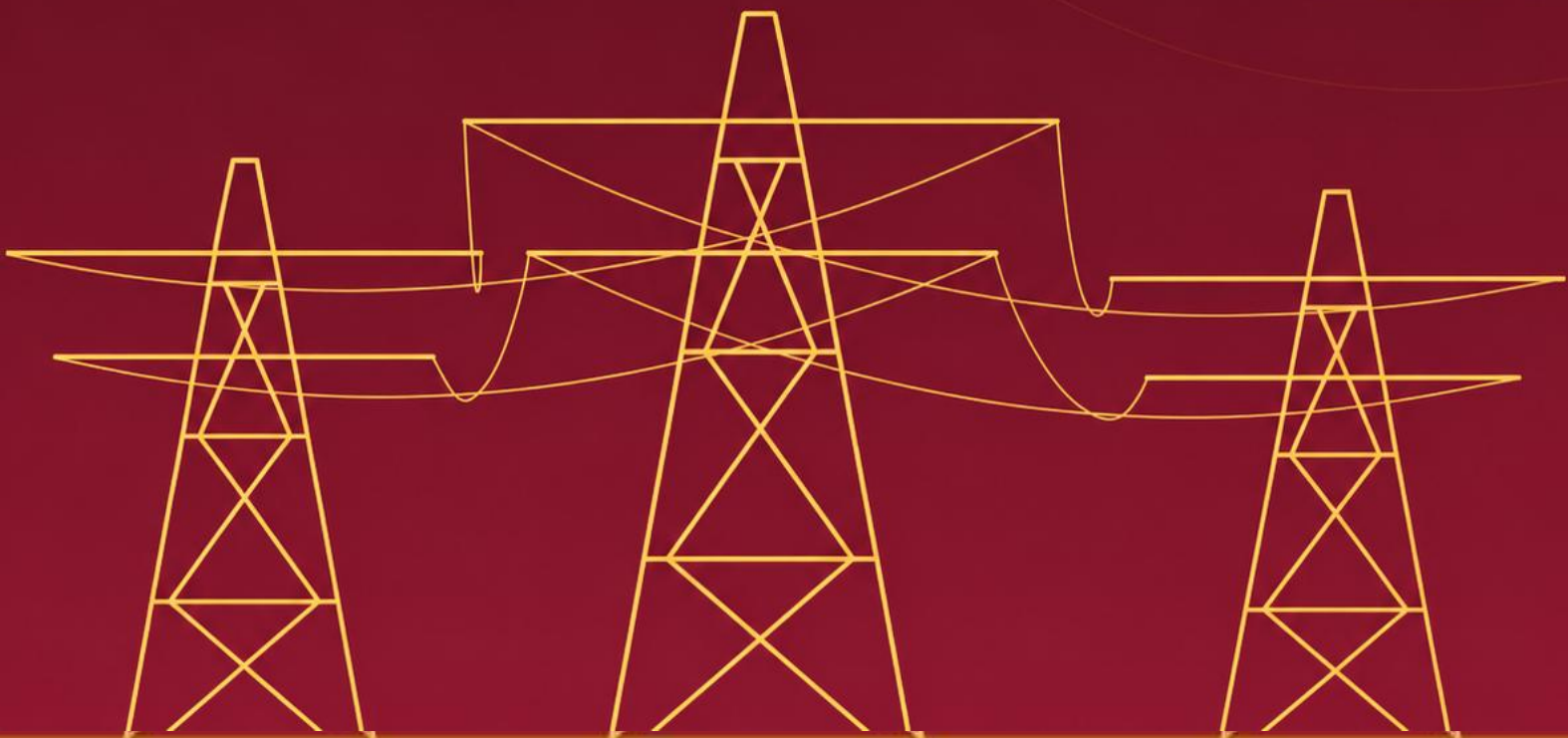
SCHOOL OF ELECTRICAL AND COMMUNICATION

**DEPARTMENT OF
ELECTRICAL AND ELECTRONICS ENGINEERING**

Spark Magazine

(2022 – 23)

ISSUE- 03 (March 2023)



Foreword



Col. Prof. Vel. Dr. R. Rangarajan
Founder President & Chancellor



Dr. Mrs. Sagunthala Rangarajan
Foundress President

We remain committed to building an educational environment that nurtures knowledge, character, innovation, and excellence. Our institution continues to encourage students and faculty to pursue meaningful academic, research, and technological endeavors, supported by modern infrastructure, well-equipped laboratories, and a dedicated faculty. The Department of Electrical and Electronics Engineering reflects this vision through its academic achievements, research initiatives, funded projects, industry collaborations, and the accomplishments of its students and faculty.

LEADERSHIP



Dr. Rangarajan Mahalakshmi Kishore
Chairperson & Managing Trustee

I am delighted to present this vibrant edition of SPARK, the magazine of the Department of Electrical and Electronics Engineering. This magazine reflects the department's academic excellence, student contributions, innovative initiatives, and technical achievements. As technology continues to evolve, I encourage students and faculty to embrace lifelong learning, explore emerging technologies, and apply their knowledge to address real-world challenges. I congratulate the editorial team and the entire EEE department for their dedicated efforts in bringing out this edition and showcasing the department's accomplishments and vision.

Wishing SPARK continued success in inspiring innovation, creativity, and excellence!



LEADERSHIP



Prof. S. Salivahanan
Vice Chancellor

I am delighted to present the latest edition of Spark, the flagship magazine of the EEE Department. This magazine reflects our continuous pursuit of research excellence, creativity, co-curricular activity and technical learning of our students. Kudos to the editorial team, faculty, and brilliant students whose hard work and contributions made this edition possible.



Prof. Dr. E. Kannan
Registrar

I warmly congratulate the EEE Department on launching this vibrant edition of Spark. This platform beautifully captures the dynamic activities, student achievements, and academic excellence of the department. I wish the EEE team continued success in inspiring our community through such creative and meaningful initiatives.



Message from Dean and Head of the Department

Dr. V. Jayasankar

Professor & Dean
School Of Electrical and Communication



Driven by our faculty, students, and staff, the School continues to make remarkable progress in cutting-edge research, academic excellence, and industry collaboration. Spark, the EEE department magazine, beautifully highlights this journey—showcasing our commitment to innovation, hands-on learning, and community impact. I commend the team for their dedication to shaping future-ready professionals and bringing these key milestones to light.

Dr. P.Chandrasekar

Professor & Head
Department of Electrical and Electronics Engineering



It is with great pleasure and pride that I present SPARK, the official magazine of the Department of Electrical and Electronics Engineering. I invite you to explore these pages to discover the remarkable achievements and initiatives within our department. Together, we look forward to a bright future defined by groundbreaking research, transformative education, and impactful contributions to the field.

VISION OF THE DEPARTMENT

To provide intellectual curiosity in the field of Electrical and Electronics engineering that produces skilled interdisciplinary engineers to serve the society.

MISSION OF THE DEPARTMENT

M1: To inculcate knowledge among the students through comprehensive curriculum.

M2: To enrich the academic experience in terms of flexibility, teamwork, design skills, practice and industrial trainings.

M3: To produce competent graduates suitable for a successful career in Industry and Research.

PROGRAMME EDUCATIONAL OBJECTIVE

PEO1: Design and analyse electrical and electronic systems by applying the knowledge of mathematics and engineering.

PEO2: Provide practical solution to multidisciplinary societal problems through innovative ideas.

PEO3: Secure positions and continue as valued, creative and proficient employees in a wide variety of fields and industries for a rewarding career.



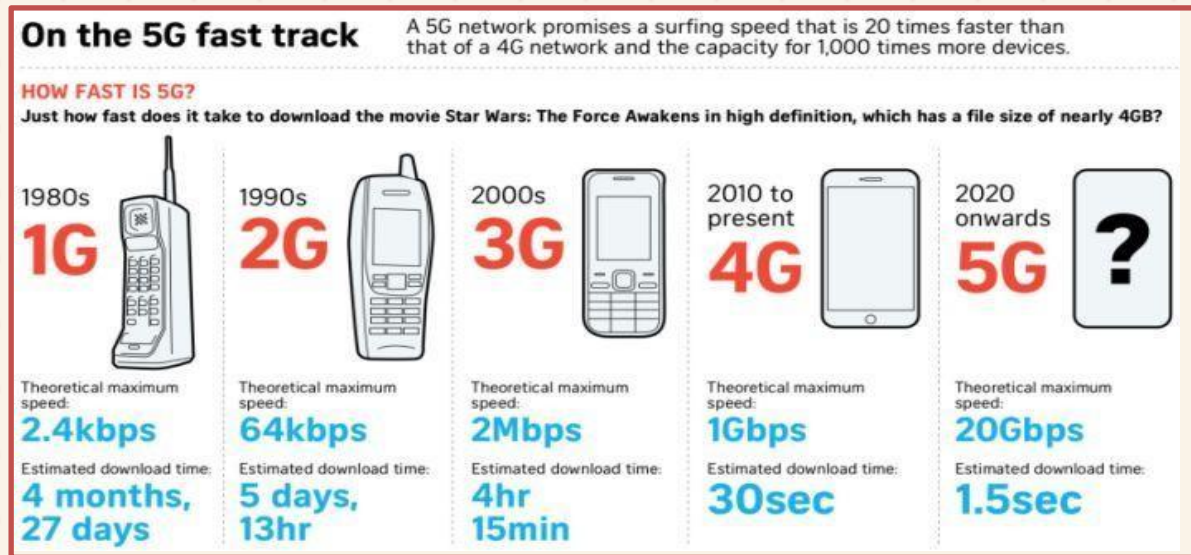
BLOCK CHAIN TECHNOLOGY



A block chain is a system of recording information in such a way that makes it difficult or impossible to change, hack or cheat the system. A block chain is essentially a digital ledger of transactions that is duplicated or distributed across the entire network of computer systems on block chain. Block chain is a type of DLT in which transactions are recorded with an immutable cryptographic signature called a hash. The goal of block chain is to allow digital information to be recorded and distributed, but not edited, in this way block chain is the foundation for immutable ledgers, or records of transactions that cannot be altered, deleted or destroyed. It is expected that block chain will expand the scope of usability in many more sectors including finance data analysis, and the Internet of things with the advent of 5G. Usage of block chain system in different sectors apart from cryptocurrencies and NFTs can easily save time, money and can solve many problems. Although the block chain technology is older than Bitcoin, it is a core underlying component of most cryptocurrency networks, acting as a decentralized, distributed and public digital ledger that is responsible for keeping a permanent record (chain of blocks) of all previously confirmed transactions. As a distributed ledger technology (DLT) the block chain is intentionally designed to be highly resistant to modification and frauds (such as double-spending).

VTU 11938 Naga Swetha

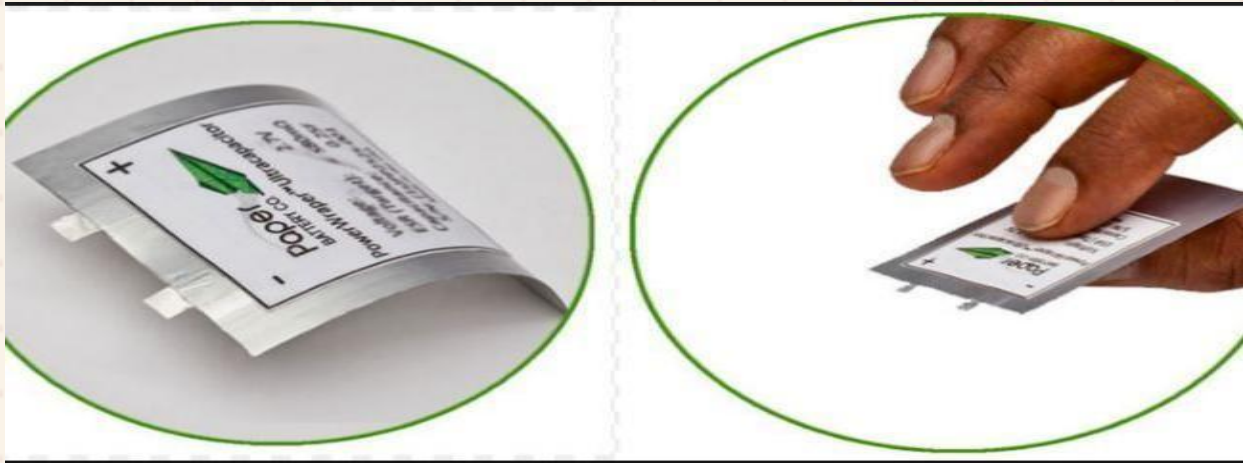
5G MOBILE TECHNOLOGIE



5G (5th generation mobile networks or 5th generation wireless systems) is a name used in some research papers and projects to denote the next major phase of mobile telecommunications standards beyond the upcoming 4G standards (expected to be finalized between approximately 2011 and 2013). Currently, 5G is not a term officially used for any particular specification or in any official document yet made public by telecommunication companies or standardization bodies such as 3GPP, wimax forum or ITU-R. New 3GPP standard releases beyond 4G and LTE Advanced are in progress, but not considered as new mobile generations. The implementation of standards under a 5G umbrella would likely be around the year of 2020. 5G technology stands for 5th generation mobile technology. Ensuring the promises of reliable and efficient communications brings new challenges to the design of 5G products. 5G connectivity requires high throughput, low latency, and exceptional coverage at a reasonable cost, all while reducing energy consumption. As networks and applications grow, the precise simulation of antennas in their environment is the key to developing the next generation of broadband products. Altair 5G simulation solutions support and enable the innovation and deployment of wireless connectivity technology improving communication, assuring compatibility, and reducing energy consumption and emission.

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PAPER BATTERY



A paper battery is a thin, flexible energy production and storage device that is formed by combining carbon nanotubes with a conventional sheet of cellulose-based paper. In addition to being disposable, paper batteries may be folded, cut or otherwise shaped for different applications without any loss of integrity or efficiency. As sensors are increasingly being embedded in everyday objects, there has been a corresponding need for alternative power sources in the Internet of Things (IoT). The high cellulose content and lack of toxic chemicals in paper batteries make them both biocompatible and environmentally friendly, especially when compared to the lithium ion batteries used in many present-day electronic devices. A paper battery is engineered to use a spacer formed largely of cellulose. It incorporates nano scopic scale structures to act as high surface area electrodes to improve conductivity. In addition to being unusually thin, paper batteries are flexible and environmentally friendly, allowing integration into wide range of products. Their functioning is similar to conventional chemical batteries with the important difference that they are non-corrosive and do not require extensive housing. Recently, researchers at the State University of New York printed thin layers of metals and polymers onto a paper surface that contains freeze-dried exoelectrogens, a type of bacteria that can transfer electrons outside the bacteria's cellular walls. Any type of bio-liquid can be used to revive the exoelectrogens and activate the paper battery by allowing bacteria to pass through cell membranes and make contact with external electrodes.

VTU18180 Jashuva

HOSTEL LIFE

Hostel life is a vibrant phase of student existence, blending independence, learning, and self-discovery. Leaving the comfort of home, students enter a unique shared environment that acts as a stepping stone toward adulthood.

Living with peers teaches essential life skills—managing a budget, keeping a schedule, and balancing freedom with responsibility. Late-night study sessions, endless conversations, sharing meals, and navigating triumphs and challenges together form bonds of friendship that often last a lifetime. Hostel living instills resilience, patience, and adaptability as students learn to coexist with individuals from diverse cultures, backgrounds, and perspectives.

While managing chores and adjusting to communal living can be challenging initially, it builds emotional strength and maturity. Hostel life transforms young individuals into confident, empathetic, and independent adults, offering unforgettable memories and life lessons that shape a person far beyond their academic years.

VTU17011 Ajeeth Kumar

The relay changes its own settings when the network changes, instead of relying on one fixed setting for every case.

FUN AND LEARN

Books open up a world so bright,
Where learning feels just like delight!
We count the stars and trace the moon,
And sing a happy, catchy tune.
With every page, we play and grow,
Exploring things we didn't know.
For learning is a fun parade,
Where magical memories are made!

VTU20248 K GUHAN

The relay changes its own settings when the network changes, instead of relying on one fixed setting for every case.

Artificial Intelligence (AI)

Artificial Intelligence (AI) is transforming the world by enabling machines to perform tasks that typically require human intelligence, such as problem-solving, learning, and decision-making. From personalized recommendations on streaming platforms to advanced medical diagnostics, AI has quietly integrated into every aspect of modern life.

Its impact spans across vital sectors: automation optimizes industrial manufacturing, machine learning accelerates scientific discovery, and AI-driven tools personalize education. However, this rapid advancement brings critical ethical challenges, including data privacy concerns, algorithmic bias, and potential job displacement. Balancing technological progress with responsible oversight is essential to ensuring AI serves humanity ethically and equitably.

Ultimately, artificial intelligence is not merely a tool for efficiency, but a transformative force reshaping how we live, work, and interact. Embracing AI thoughtfully will allow society to harness its full potential while safeguarding human values for the future.

VTU 11938 Naga Swetha

The relay changes its own settings when the network changes, instead of relying on one fixed setting for every case.

Art: Shading Some Real Truth!



VTU11999 R S ASWIN KUMAR

PUZZLES

PUZZLE

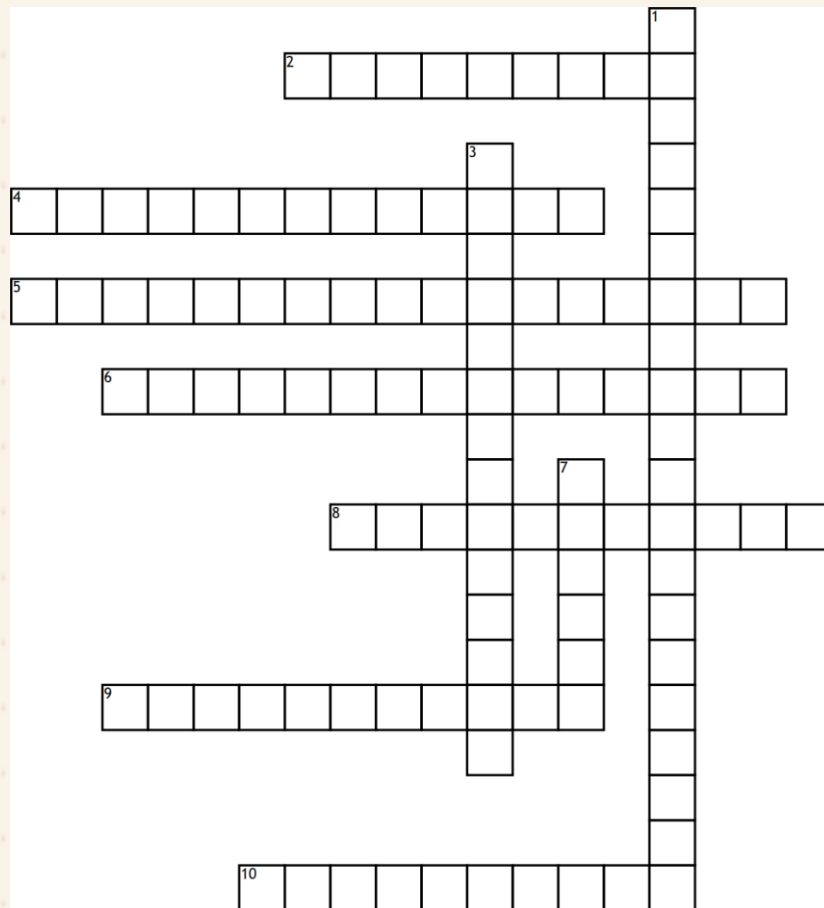
Across

2. process of generating an electric current from the motion of a conductor in a magnetic field
4. What is produced when there is a current in the primary coil of a transformer?
5. Which of the following motor will have a relatively higher power factor
6. The armature of DC motor is laminated to reduce

8. Torque weight ratio will be least in instruments
9. material that can be magnetized
10. In a split-phase motor, the running winding should have high

Down

1. Megger is used to measure
3. In a DC machine fractional pitch winding is used to
7. You insert an electric plug into this to connect to the source of energy



Riddle

- 1.What goes round the house and in the house but never touches the house?
- 2.What comes once in a minute, twice in a moment, but never in a thousand years?
- 3.I am taken from a mine, and shut up in a wooden case, from which I am never released, and yet I am used by almost everybody.
- 4.Brothers and sisters have I none but that man's father is my father's son.
- 5.There are four brothers in this world that were all born together. The first runs and never wearies. The second eats and is never full. The third drinks and is always thirsty. The fourth sings a song that is never good.
- 6.What belongs to you but others use it more than you do?
- 7.I am the beginning of sorrow, and the end of sickness. You cannot express happiness without me, yet I am in the midst of crosses. I am always in risk, yet never in danger. You may find me in the sun, but I am never out of darkness.
- 8.A cloud was my mother, the wind is my father, my son is the cool stream, and my daughter is the fruit of the land. A rainbow is my bed, the earth my final resting place, and I'm the torment of man.
- 9.What is it the more you take away the larger it becomes?
- 10.I have a little house in which I live all alone. It has no doors or windows, and if I want to go out I must break through the wall.

- 1)The sun
- 2)The letter M
- 3)Pencil lead
- 4)My son
- 5)Water, fire, earth, wind

- 6)Your name
- 7)The letter S
- 8)Rain
- 9)A hole
- 10)A chicken in an egg

VTU18180 Jashuva

SUDOKU: Fun and Learn...

SUDOKU



2				3			4	
	3		6					7
		9			7	1		8
		4		7	2			
	2	5		8	1	9		
1		3			6			5
				2		4		
4		6	8				7	
5			9			3		



2	5	7	1	3	8	6	4	9
8	3	1	6	4	9	2	5	7
6	4	9	2	5	7	1	3	8
2	5	7	9	7	2	8	1	3
6	8	9	3	8	1	9	6	4
1	4	3	4	9	6	7	2	5
7	6	4	7	2	5	4	9	6
9	1	2	8	1	2	5	7	2
8	3	5	9	6	4	3	8	1

Answer Key

VTU18180 Jashuva

QUIZ CHALLENGE: Fill THE BLANK

•The zero-state response of any linear time-invariant (LTI) system can be completely determined by finding the _____ of the input signal and the system's impulse response.

Answer: Convolution

•For a continuous-time LTI system to be bounded-input, bounded-output (BIBO) stable, its impulse response must be absolutely _____ over the entire time domain.

Answer: Integrable

•Complex exponential signals serve as the _____ of LTI systems because passing them through the system changes only their amplitude and phase, leaving their frequency unchanged.

Answer: Eigenfunctions

•An LTI system is said to be _____ if its output at any given time depends exclusively on the present and past values of the input, meaning its impulse response is zero for all negative time.

Answer: Causal

•A system property where a time-shift introduced into the input signal results in an identical time-shift in the output response is known as _____.

Answer: Time-invariance

•The Fourier transform of an LTI system's impulse response yields its _____ response, which describes how the system scales and shifts individual sinusoidal frequency components.

Answer: Frequency

•A system that satisfies both the additivity and homogeneity properties—meaning the response to a weighted sum of inputs is the weighted sum of individual responses—is classified as a _____ system.

Answer: Linear

•An LTI system whose output at any instant depends solely on the current input, featuring an impulse response proportional to a Dirac delta function, is said to be _____.

Answer: Memoryless

◆ CREDITS

Editorial Team & Acknowledgements**ACKNOWLEDGEMENTS**

The editorial team thanks the management of Vel Tech for their constant encouragement, the Head of the Department for guidance, the faculty members who contributed articles, and student's who shared their contents

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