



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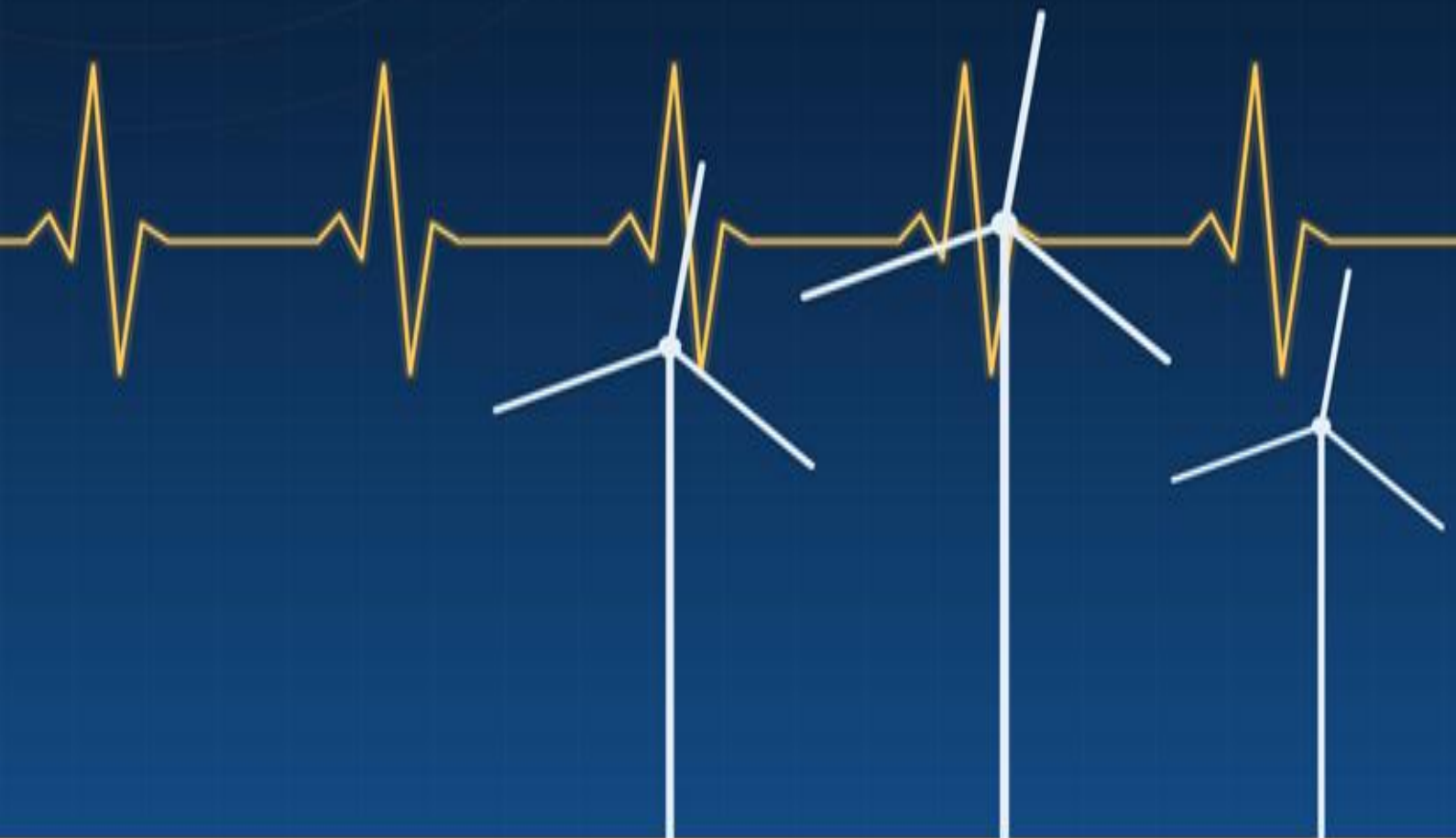
SCHOOL OF ELECTRICAL AND COMMUNICATION

**DEPARTMENT OF
ELECTRICAL AND ELECTRONICS ENGINEERING**

Spark Magazine

(2024 – 25)

ISSUE- 01 (September 2024)



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.

Foreword



Mrs. Rangarajan Mahalakshmi Kishore
Chairperson & Managing Trustee

Delighted to witness the achievements of faculty and students across academic and research activities, the Chairperson congratulates the entire team on the effort behind this report and commends the department for producing talent-driven, innovative engineers to meet society's new and challenging issues.



Foreword



Prof. Dr. Rajat Gupta
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. R. S. Valarmathi

Professor & Dean
School Of Electrical and Communication



The School continues to make remarkable progress, driven by the achievements of our faculty, students and staff in cutting-edge research, academic excellence, and industry collaboration. Spark, the magazine of EEE department serves as a wonderful window into this journey—reflecting our focus on innovation, hands-on learning, and community impact. I commend the entire team for shaping our students into future-ready professionals and bringing these milestones to light.

Dr. S. Ramesh

Professor & Head
Department of Electrical and Electronics Engineering



It is with great pleasure and a deep sense of pride that to present the SPARK-Magazine of the Department of EEE. I encourage you to delve into the pages of this magazine to gain a deeper understanding of the remarkable work that has taken place within our department. Together, we can look forward to an even brighter future filled with groundbreaking research, transformative education, and meaningful contributions to the field of electrical and Electronics engineering.

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.

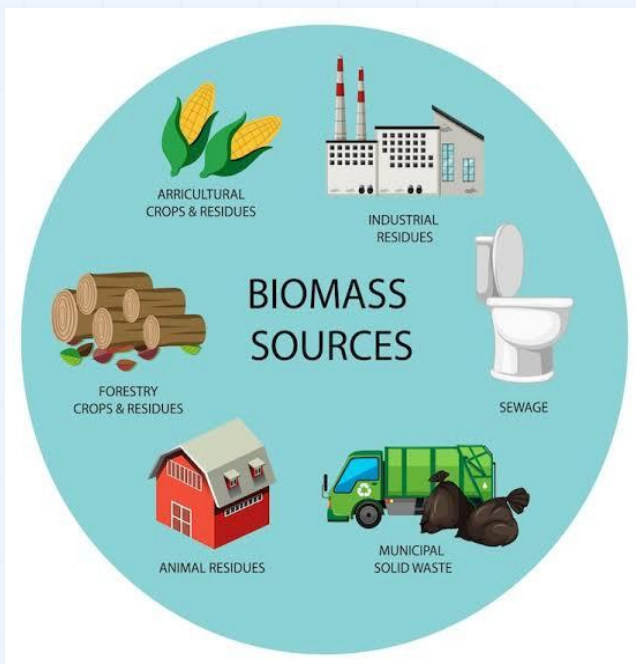
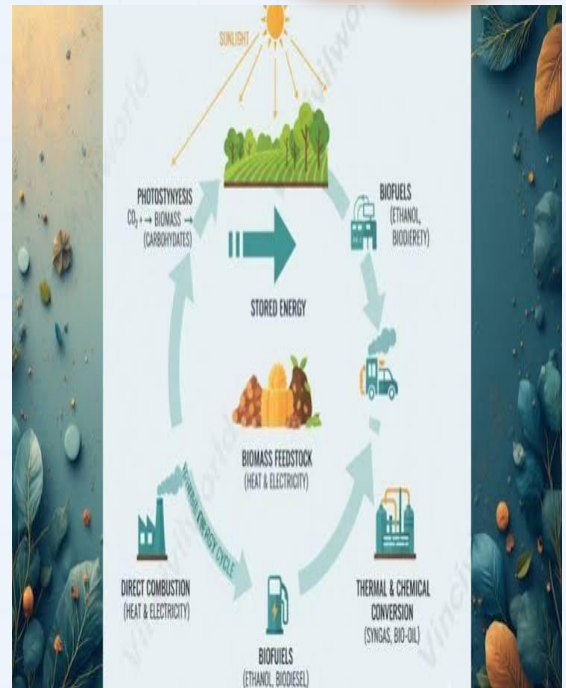
PEO3: Secure positions and continue as valued, creative and proficient employees in a wide variety of fields and industries for a rewarding career.



Future Biomass Conversion: From Waste to Sustainable Energy

Waste to Energy

Biomass conversion is the process of converting organic waste into useful energy and valuable products. In the future, agricultural, food, forestry and animal wastes can be effectively utilized as raw materials. Advanced technologies such as gasification, pyrolysis, and anaerobic digestion can improve conversion efficiency. Biomass can be converted into biogas, biofuels, syngas, bio-oil, and biochar. AI and IoT can be used to monitor biomass quality and optimize the conversion process.

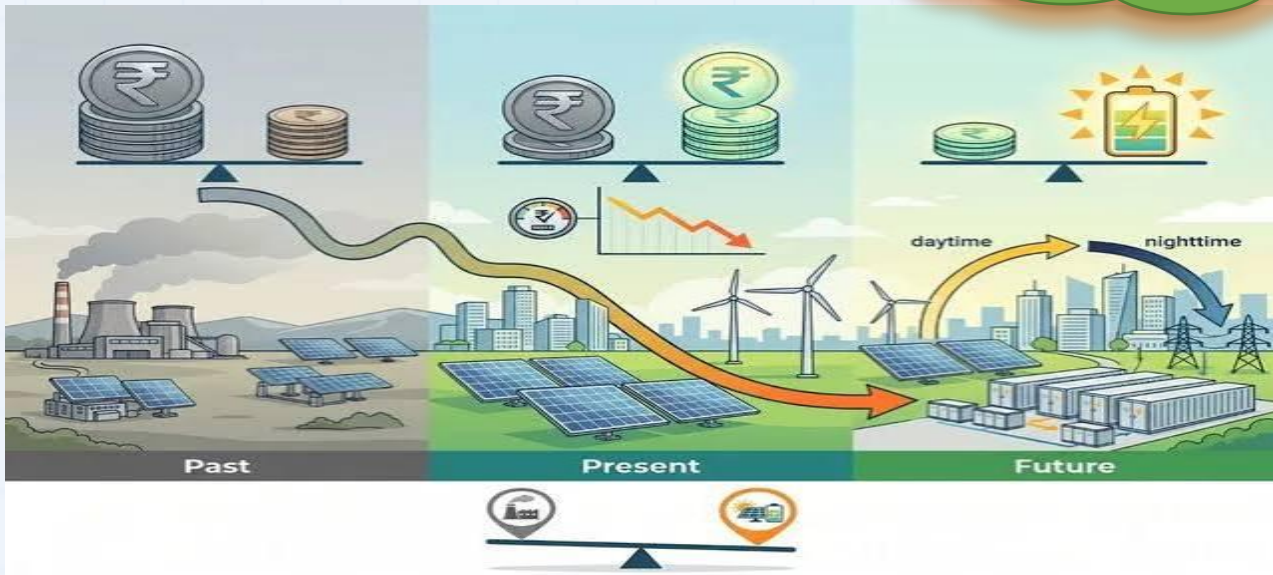


Biomass is a renewable source of energy that uses organic materials such as agricultural waste, wood, food waste and animal waste. It helps to reduce the dependence on fossil fuels and can reduce waste sent to landfills or open burning. Biomass can produce electricity, heat, biogas, biofuels, and useful by-products such as biochar. It can support rural communities by creating jobs and providing additional income from agricultural residues. Biomass energy can also be stored and used when required, unlike some intermittent renewable sources. When sustainably managed, biomass can contribute to an eco friendly and more sustainable energy system.

**VTU27147 , SUDA VENKATA
JASWANTH REDDY**

Future of Solar Energy in India

Bright, Clean & Endless



In India, solar energy has a strong future because of the country's abundant sunlight and growing electricity demand. Solar panels can be installed at homes, industries, farms, highways, and public buildings to generate clean electricity. Future solar systems will increasingly combine battery storage, smart grids, electric vehicles and AI-based energy management. Farmers can also use solar power for irrigation and agricultural operations. Large solar parks can supply electricity to cities and industries, while rooftop solar can reduce dependence on grid electricity. Solar energy can also support the production of green hydrogen for future industries and transport. Overall, solar power can become an important part of India's transition toward a cleaner and more sustainable energy system.

India has a strong potential for solar energy because of its high solar radiation and large geographical and rooftop areas. In the future, solar power will be used not only in large solar parks but also in homes, industries, farms, schools, and public buildings. Battery energy storage will allow electricity generated during sunny hours to be used at night. Solar energy can be integrated with electric vehicles, smart grids, green hydrogen, and agricultural irrigation systems.

**VTU27146 , YARRAGUDI
MUKTHESHWERA REDDY**

Nuclear Energy in India



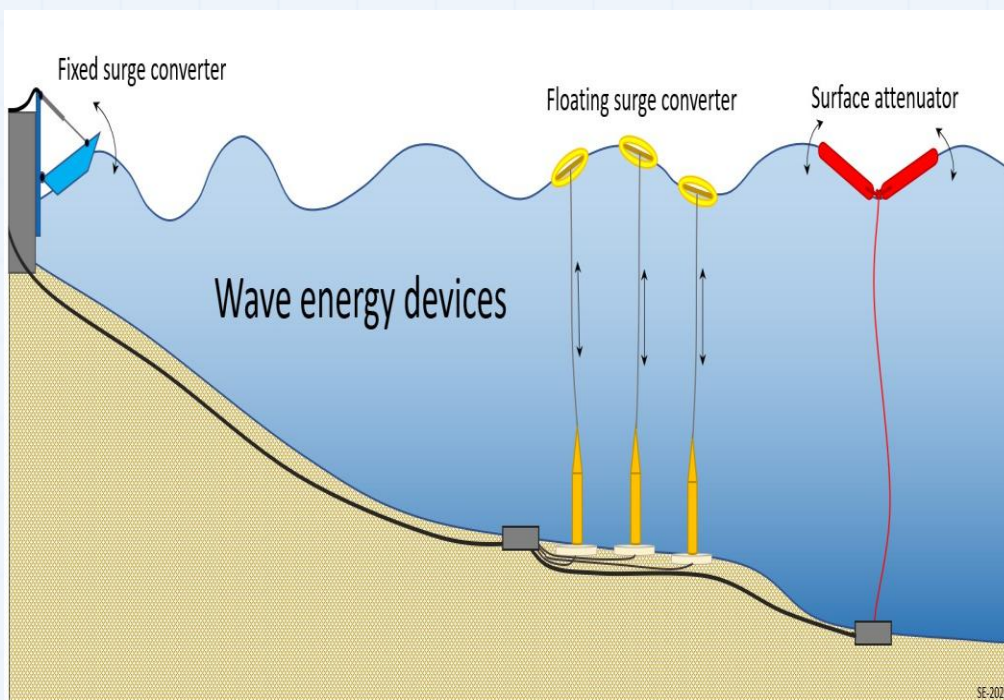
Nuclear energy is expected to play an important role in India's future electricity system because it can provide continuous, low-carbon electricity alongside renewable sources such as solar and wind. India currently has 24 commercial nuclear reactors operated by NPCIL, with 8,780 MW of installed capacity, and seven more reactors totaling 6,100 MW capacity under construction.

In the future, India is developing more indigenous 700 MW pressurized heavy-water reactors, while projects such as Kudankulam and other sites are expanding nuclear generation. NPCIL projects its installed capacity to reach 21,980 MW by year 2031–32.

Nuclear power can work together with solar and wind by supplying electricity when renewable energy generation is low. Future nuclear technology may also support hydrogen production, industrial heat, desalination, and other energy-intensive applications. Advanced reactor designs and improved safety systems could further develop the sector.

Tidal and Ocean Energy: New Power Source

Tidal and ocean energy is a renewable energy source that uses the natural movement of seawater to generate electricity. Tidal energy uses the rise and fall of tides and the flow of tidal currents, while wave energy captures the movement of ocean waves. Another technology, Ocean Thermal Energy Conversion (OTEC), uses the temperature difference between warm surface water and cold deep water to produce power. In the future, advanced underwater turbines, floating wave-energy devices, and improved energy-storage systems can increase the use of ocean energy. Artificial intelligence can help predict tides and waves and optimize energy production. Ocean energy can provide a reliable complement to solar and wind power because tides and ocean movements are highly predictable. With improved technology and reduced costs, tidal and ocean energy could become an important part of the world's future renewable-energy system.



Can We Stop Climate Change?

Climate change is one of the biggest challenges facing humanity. It is mainly caused by the increasing concentration of greenhouse gases such as carbon dioxide and methane in the atmosphere, largely from burning fossil fuels, deforestation, agriculture, and industrial activities. Although completely stopping climate change is not realistic in the short term, limiting global warming and reducing future climate impacts is possible.

Renewable energy sources such as solar, wind, hydropower, and geothermal energy can replace a significant amount of fossil-fuel use. Electric vehicles, energy-efficient buildings, smart electrical grids, and better public transportation can further reduce emissions. Industries can explore technologies such as green hydrogen, carbon capture, and low-carbon manufacturing to felicitate a green environment.



VTU27044, KOTTE CHANDANA

Can We Live Without Plastic?

Plastic has become an integral part of modern life because it is lightweight, inexpensive, durable, and useful in products ranging from packaging to medical equipment and electronics. However, large amounts of plastic waste can persist in the environment for longer periods leading to pollution. Can we live completely without plastic? Probably not easily with today's technology, because plastics are used in many essential applications, including sterile medical equipment, electrical insulation, transportation, construction, and food safety. However, we can significantly reduce our dependence on unnecessary and single-use plastics.

Future alternatives include paper-based materials, glass, metals, biodegradable materials, and bio-based plastics made from renewable resources. Scientists are also developing new materials that can perform like conventional plastics while being easier to recycle or dispose under appropriate conditions. Recycling can help keep plastic in use for longer, but it cannot solve every problem. Better product design, reuse systems, improved waste collection, and responsible consumption are also important.

The goal may not be a completely plastic-free world, but a smarter materials world where plastic is used only when it provides an important benefit, products are designed for reuse and recycling, and safer alternatives replace unnecessary plastic. The future question is not “Can we eliminate all plastic?” but “Can we learn to use materials without creating hazardous permanent waste?”

VTU27145 , STEEVENSON SOHTUN

The Language of Circuits

Circuits speak a language without a sound,
Where paths of electrons travel round.
They speak through voltage, current and flow,
In patterns engineers learn to know.

A resistor whispers, "Control the Flow",
A capacitor stores what currents show.
An inductor builds its magnetic field,
While switches decide when paths are sealed.
A diode lets the current choose its way,
Blocking one direction, guiding another each day.

A transistor switches, amplifies too,
Making countless electronic dreams come true.
Through every connection, a message is sent,
Through every component, energy is spent.
A tiny change can transform the whole,
As engineers turn ideas into a goal.

VTU 21247 Tejaswini

Whispers of Summer

The morning sun spills gold across the floor,
As summer arrives with its fiery grace,
A gentle breeze drifts through the open door,
To cool the quiet warmth upon my face.

The mango trees are heavy, ripe, and sweet,
While distant cicadas sing their steady song,
The dusty roads reflect the afternoon heat,
Where lazy shadows stretch out deep and long.

As evening comes, the sky turns rose and bright,
A refreshing glass of lemonade in hand,
The day fades slowly into cool starlight,
And peace rests gently over all the land.

VTU 21247 Tejaswini

First Year: Stepping into College

Stepping into an engineering college for the first time is a mix of quiet anxiety and high expectations. You arrive equipped with brand-new notebooks, a scientific calculator and grand visions of inventing the future.

The initial few months, however, serve a swift reality check. The syllabus feels like high school physics and math on fast-forward. Engineering Graphics tests your patience with 2H pencils and projection lines, while programming labs introduce you to the endless frustration of a missing semicolon. Between morning lectures that feel like endurance tests and lab submissions that demand pristine records, time moves fast.

Yet, amid the academic grind, quick camaraderie builds. Friends made over shared assignment answers, late-night tea and canteen debates become your anchors. You learn to decipher an entire semester's syllabus right before exams, join college fests, and realize engineering is really about learning how to solve problems under pressure. As the first year ends, you look back at that nervous fresher on day one with a smile—you have survived the initiation and are officially an engineer in the making

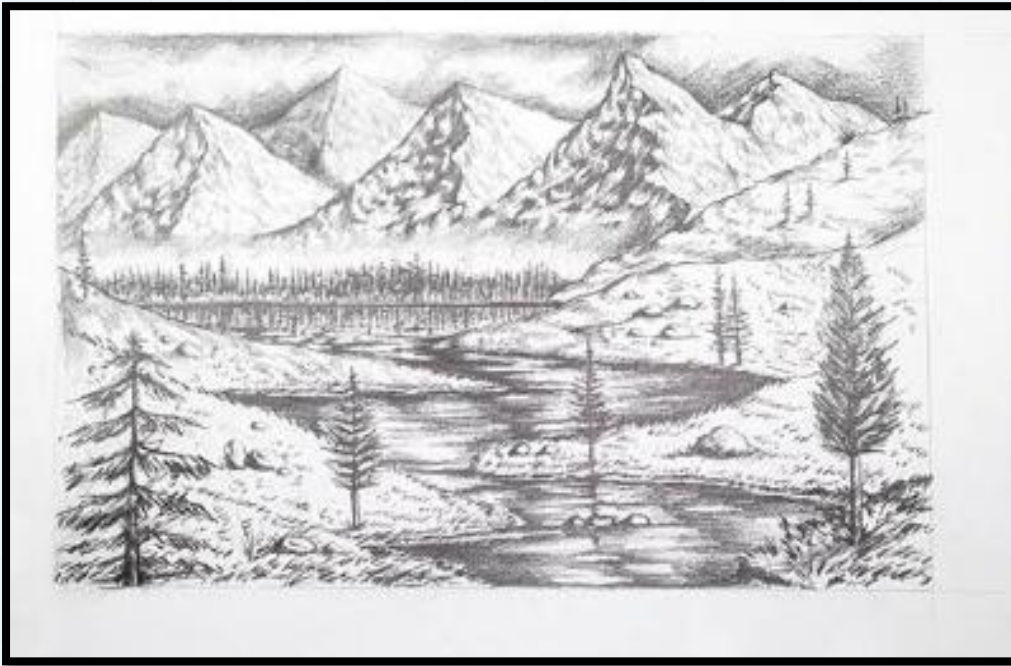
Rangoli: Dots, Dust, Delight

Rangolis'



VTU21247 Tejaswini

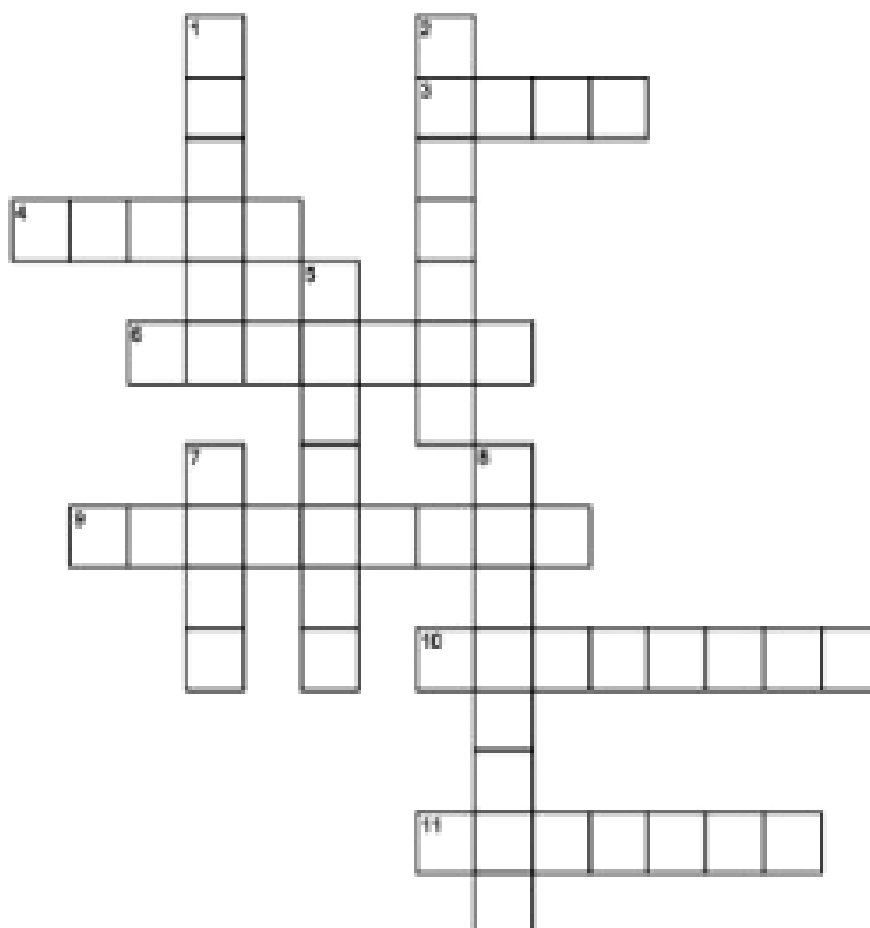
Art: Shading Some Real Truth!



VTU20975 Thoji Kajiri

Puzzle: Plug In, Play On!

Solve the following puzzle based on the clues given!



Across

- [3] A tasty yellow vegetable with kernels.
- [4] A crisp, red fruit.
- [6] Something people wear during the autumn.
- [9] Used to scare birds away from the corn.
- [10] A sport that starts in autumn.
- [11] A large orange squash that people carve faces into.

Down

- [1] One of the colors leaves turn in autumn.
- [2] The middle month of autumn.
- [5] Another word for gathering crops before winter.
- [7] Another word for autumn.
- [8] The way trees look during the autumn.

VTU20975 Thoji Kajiri

Brain Teaser

1. I oppose changes in current and store energy in a magnetic field. What am I?
2. I allow current to flow mainly in one direction. What am I?
3. I connect power systems operating at different voltage levels without changing frequency. What am I?
4. I rotate at synchronous speed and can improve power factor. What electrical machine am I?
5. I convert electrical energy into mechanical energy using electromagnetic forces. What am I?

Answer:

1. Inductor
2. Diode
3. Transformer
4. Synchronous condenser
5. Electric motor

Quiz Challenges

1. Which device converts AC into DC?
 - a. Rectifier
 - b. Diode
 - c. Amplifier

2. Which renewable energy source uses photovoltaic cells?
 - a. Wind Energy
 - b. Solar Energy
 - c. Nuclear Energy

3. What is the nominal frequency of India's electrical grid?
 - a. 25 Hz
 - b. 50 Hz
 - c. 75 Hz

4. Which device protects a circuit against excessive current?
 - a. Insulator
 - b. Switch
 - c. Fuse

5. Which instrument measures electrical power?
 - a. Ammeter
 - b. Voltmeter
 - c. Wattmeter

Answer: 1. a, 2. b, 3. b, 4. c, 5. c

◆ CREDITS

Editorial Team & Acknowledgements**ACKNOWLEDGEMENTS**

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

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