



Vel Tech
Rangarajan Dr. Sagunthala
R&D Institute of Science and Technology
(Deemed to be University Estd. u/s 3 of UGC Act, 1956)



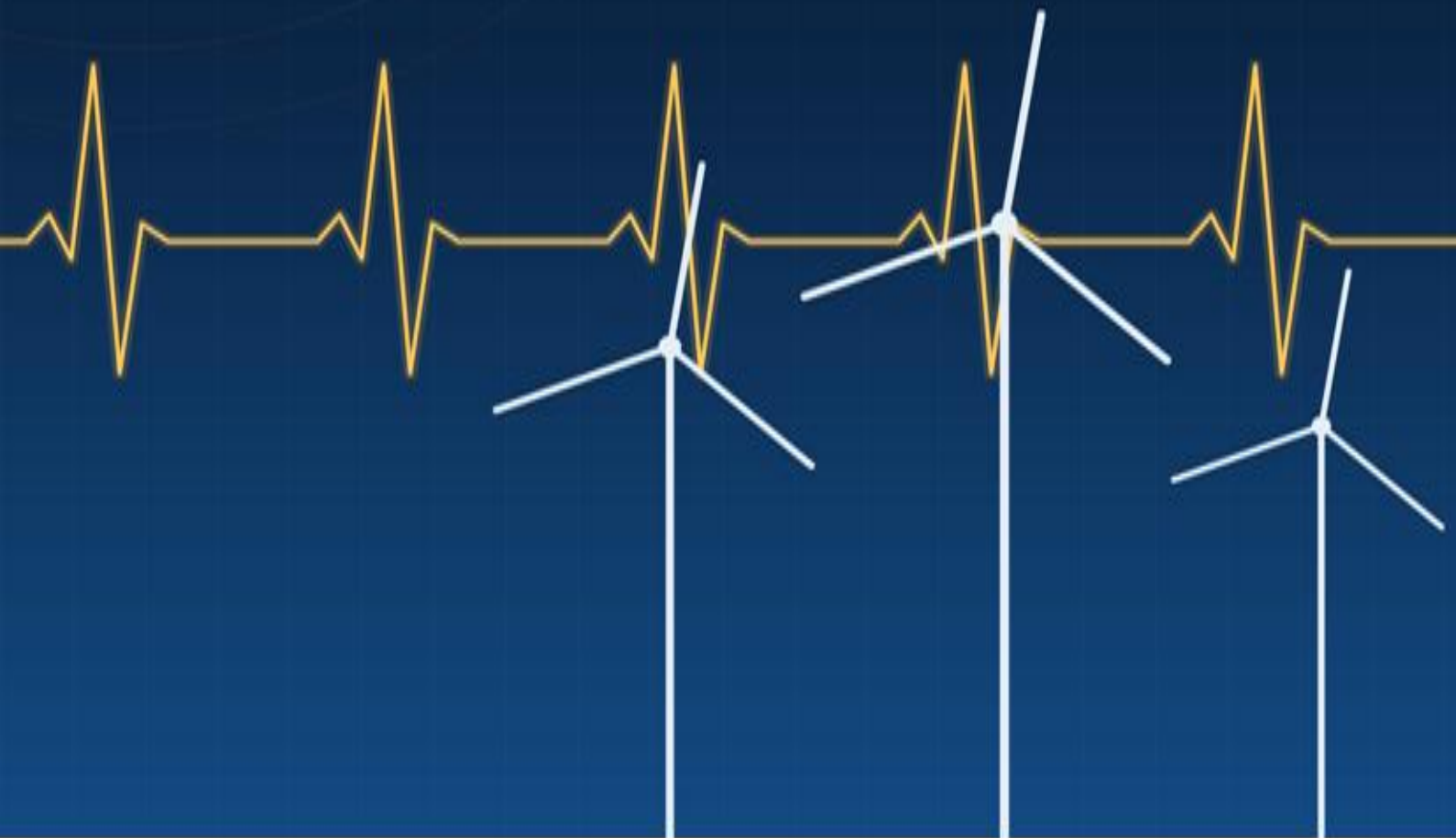
SCHOOL OF ELECTRICAL AND COMMUNICATION

**DEPARTMENT OF
ELECTRICAL AND ELECTRONICS ENGINEERING**

Spark Magazine

(2023 – 24)

ISSUE- 01 (September 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. 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.

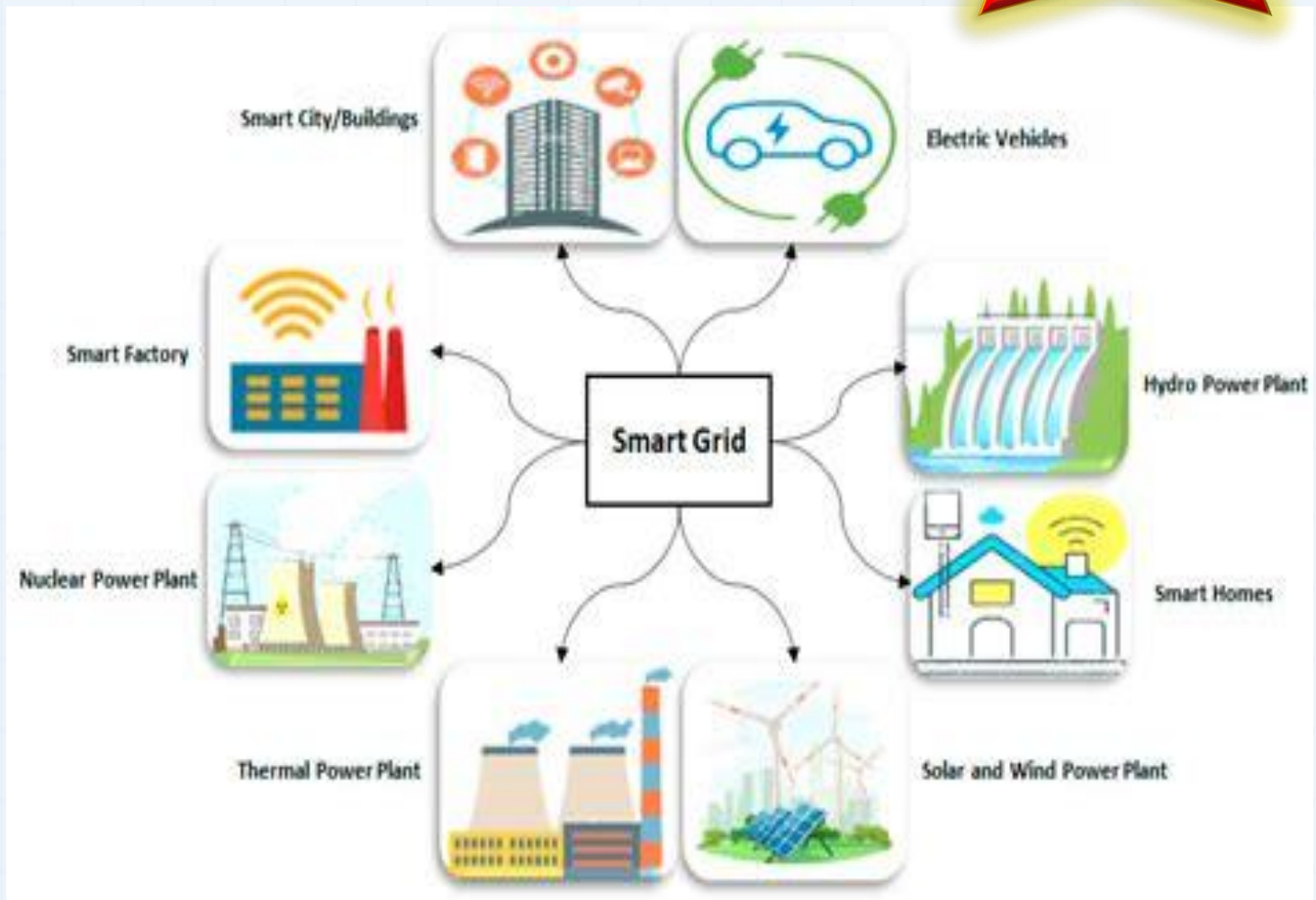
PEO2: Provide practical solution to multidisciplinary societal problems through innovative ideas.

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



Smart Energy Storage and Battery Management in Future

The Smart Charge



Main Features:

Smart meters measure electricity consumption and communicate data automatically. Real-time monitoring: Sensors provide information about the condition of the electrical network. Automatic fault detection: The system can identify faults and help isolate affected sections. Renewable-energy integration: Solar and wind power can be integrated more effectively. Demand management: Electricity consumption can be adjusted according to supply and demand. Electric-vehicle integration: EV chargers can become part of the electricity networks. Two-way communication: Information can flow between utilities and consumers.

VTU24242 DEV SHARMA

ROOFTOP SOLAR AND THE RISE OF PROSUMERS

Harnessing
the Horizon



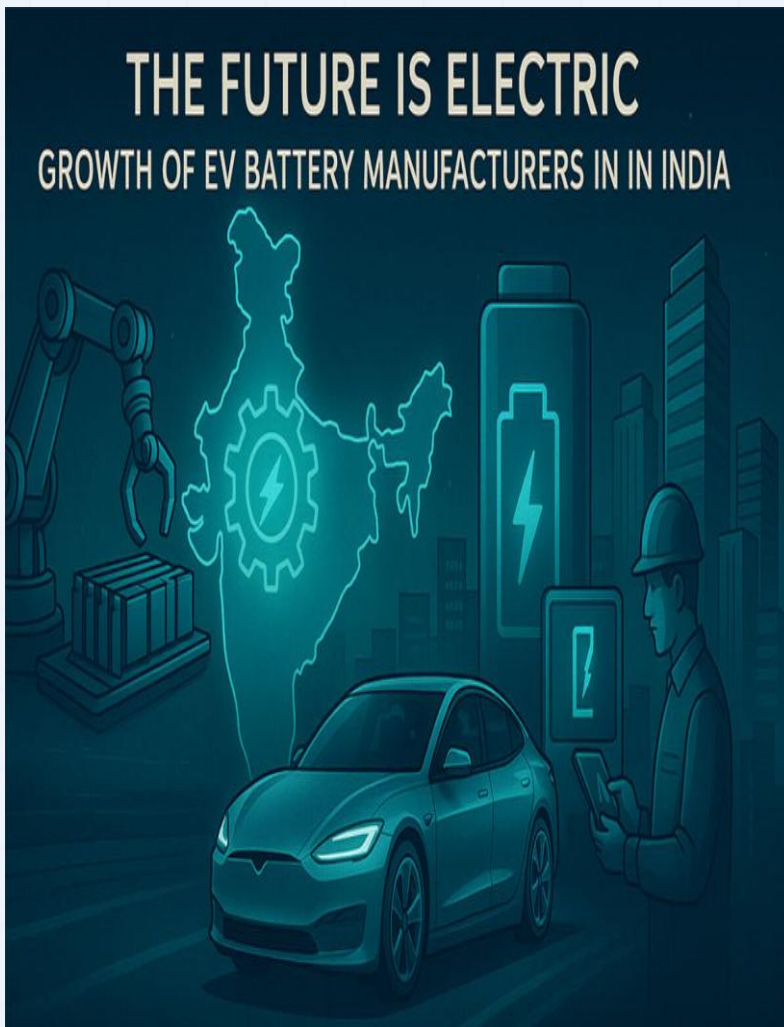
The rapid growth of rooftop solar is transforming the way electricity is generated and consumed in India. Traditionally, electricity has been produced at large power plants and transmitted through transmission and distribution networks to consumers. With the development of rooftop solar photovoltaic systems, households, commercial buildings, industries, and institutions can generate electricity at the point of consumption. This transformation is creating a new category of electricity users known as prosumers, who can both produce and consume electrical energy.

A prosumer is an individual or organization that generates electricity for its own use while remaining connected to the electrical grid. During periods of strong sunlight, a rooftop solar system can generate electricity to meet the building's demand.

VTU24263 VAMITHA L

BATTERIES: POWERING INDIA'S ELECTRIC FUTURE

The Next-Gen
Power Cell



Battery Energy Storage Systems (BESS), Renewable Energy Integration, Solar and Wind Energy, Grid Stability, Energy Storage, Peak Demand Management, Power System Reliability, Smart Grid, Transmission and Distribution Networks, Sustainable Energy, India's Energy Transition.

India's transition towards a cleaner and more electrified economy is increasing the importance of energy storage. Batteries are becoming a critical part of the country's electrical infrastructure because renewable sources such as solar and wind do not generate electricity continuously. Energy storage allows electricity generated when renewable resources are available to be stored and used when demand is high or renewable generation is low.

The role of batteries extends beyond storing electricity. In the future Indian power system, battery energy storage systems can support grid stability, manage variations in renewable generation, improve the reliability of electricity supply and reduce pressure on transmission and distribution networks. Large-scale battery installations can store surplus renewable electricity during periods of high generation and supply it during evening peak-demand periods.

GREEN HYDROGEN: INDIA'S NEXT ENERGY FRONTIER



The H₂ Revolution Cell

Green hydrogen is produced through a process called water electrolysis, in which electricity generated from renewable sources is used to split water (H₂O) into hydrogen (H₂) and oxygen (O₂). When renewable electricity powers the electrolyser, hydrogen can be produced with very low operational carbon emissions.

India is moving towards a cleaner and more sustainable energy system, and **green hydrogen** is emerging as an important technology in this transition. Green hydrogen is produced by splitting water into hydrogen and oxygen through electrolysis using electricity generated from renewable sources such as solar and wind. Since the production process can avoid direct carbon emissions when powered by renewable electricity, green hydrogen has the potential to support the decarbonization of sectors where direct electrification is difficult.

India has significant potential for green hydrogen because of its rapidly expanding renewable-energy capacity and large domestic energy demand. The **National Green Hydrogen Mission** aims to establish India as a major producer and user of green hydrogen while developing domestic capabilities in electrolysers hydrogen production and related infrastructure. The mission also focuses on creating demand and supporting the development of a green-hydrogen ecosystem.

The Future Without Energy Production

Life Beyond
The Grid

Imagine a world where energy is no longer produced. Electricity would become unavailable, transportation systems would be disrupted, factories and industries would stop operating, and communication networks could eventually fail.

Modern life depends heavily on energy. Hospitals need it to operate medical equipment, schools and businesses rely on electricity and technology, and homes use energy for lighting, cooking, cooling, and heating.

ECONOMY

**A world
without
electricity**



Without reliable energy production, society would have to return to much simpler ways of living. This is why developing clean, sustainable, and reliable sources of energy is essential for our future.

Energy is not just power for machines—it is the foundation that helps modern society move forward.

VTU23880 G MOHITH

Artwork Design

**Designing the
Desire**



The artwork illustrates the vision of a sustainable and technologically advanced world powered by renewable energy. At the centre, the Earth is represented within a glowing light bulb surrounded by green leaves, symbolizing the importance of energy conservation, environmental protection, and sustainable development.

The left side highlights renewable energy sources, including solar panels, wind turbines, and hydroelectric power generation, demonstrating how natural resources can be converted into clean electricity. The right side represents a modern smart city equipped with electrical transmission networks, electric vehicles, charging stations, and energy-efficient transportation systems.

The combination of nature and advanced electrical technologies emphasizes the role of electrical engineers in developing smart grids, promoting clean energy, reducing carbon emissions, and creating environmentally responsible infrastructure.

VTU21658 PULAVARA BHAVYA PRIYA

The Smart City of Tomorrow



Poem

A city of lights beneath the morning sun,
Where technology and nature move as one.
Smart streets awaken, sensors come alive,
And intelligent systems help the city thrive.
Traffic flows smoothly, signals know the way,
Guiding every traveler throughout the day.
Electric vehicles quietly move along,
Powered by clean energy, efficient and strong.
Buildings think through sensors in every room,
Using energy wisely, reducing waste and gloom.
Lights turn on when people enter the space,
And switch off when no one is in the place.
Solar panels shine upon rooftops high,
While wind turbines turn beneath the sky.
Smart grids balance the power we need,
Connecting clean energy to every deed.

VTU22378 Varshini

Lecture Hall Drift



The lecture drones in frequencies so low,
As complex formulas begin to blur,
My mind drifts off where quiet breezes blow,
While circuits hum and cooling fans concur.

Page after page of diagrams and code,
The clock ticks slow, but deadlines fast draw near,
Yet through the stress on this demanding road,
We build the future that begins right here.

VTU22378 Varshini

My Future, My Journey

The future is a blank page, and I am the one who gets to write my story. I dream of becoming a person who is confident, independent, and proud of what I have achieved.

I know the journey will not always be easy. There will be challenges, mistakes, and moments of doubt. But I believe every experience will teach me something and help me grow stronger.

My future is not just about success; it is about becoming the best version of myself, following my dreams, making my family proud, and creating a life that has meaning.

The future is waiting for me — and I am ready to create it.

VTU27035 AKASH . R



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 chai, 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.

VTU21325 Geetha

Rangoli: Dots, Dust, Delight...

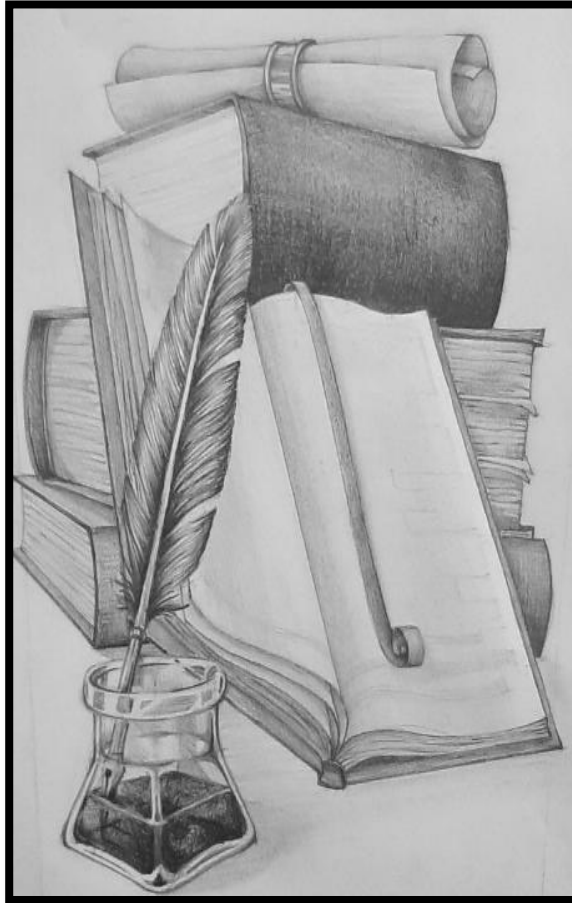
Rangolis'



VTU21361 Gurunathan
VTU22378 Varshini

Art: Shading Some Real Truth!

Arts'

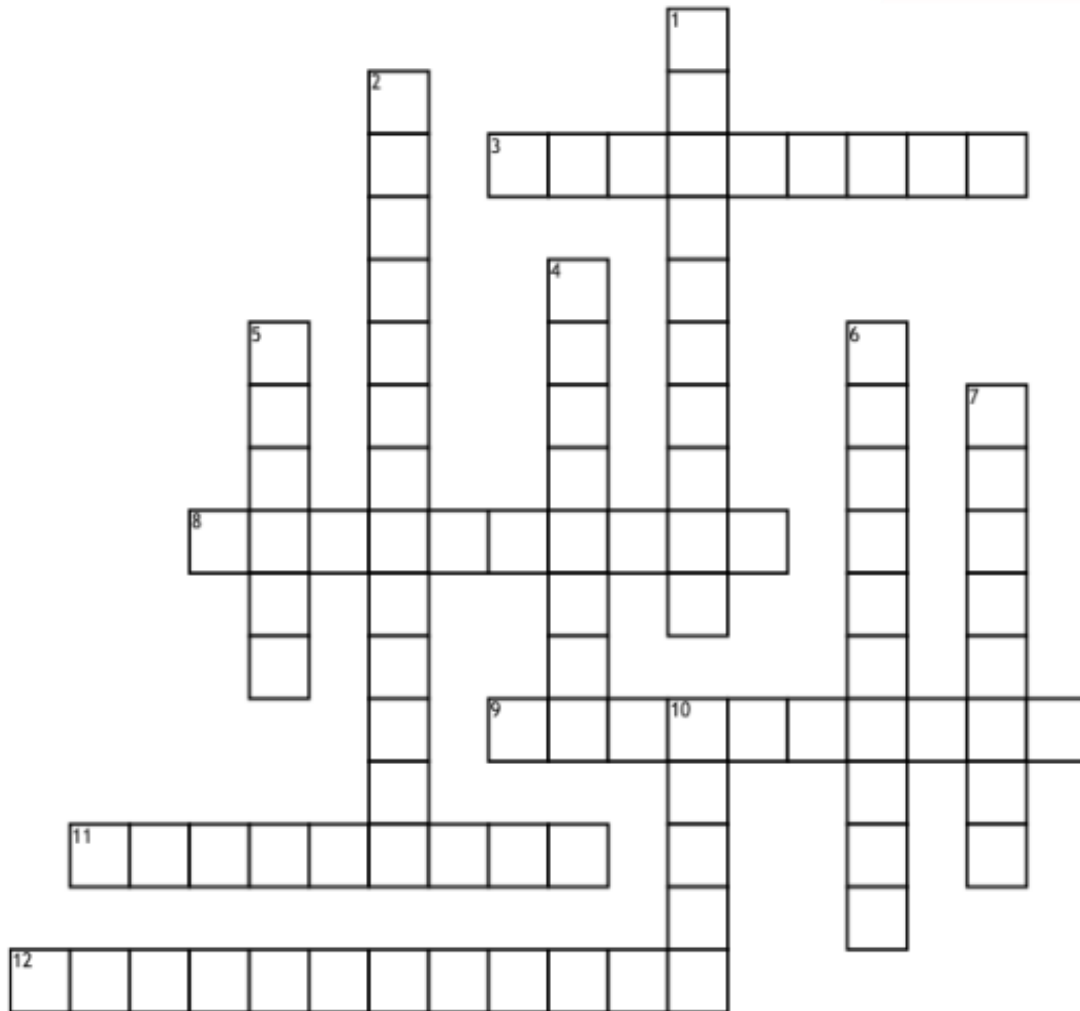


VTU21325 Geetha

VTU19723 Adesh

Puzzle: Plug In, Play On!

Puzzle



Across

3. the study of the design, development, and production of air and spacecraft
8. work with a combination of biology, medicine and engineering to analyze and design solutions that will improve patient care
9. specialize in power supply and generation
11. specialize in designing and developing technology and methods for digging the earth's surface to extract oil and gas

12. develop biofuels, plan animal environments, and find better food processing methods

Down

1. involves fields such as mining, forestry and geography
2. use science and engineering principles to protect and improve the environment
4. utilize engineering to manipulate the interactions of individual atoms and molecules; used in the research and development of new materials

5. responsible for the design and construction of seagoing vessels and structures, focusing primarily on their internal systems
6. use engineering to manipulate motion, energy and force
7. specialists who are in charge of the testing, design, development and maintenance of computer software for business and personal use
10. specialize in road, bridge, buildings and water supply system design and construction

VTU21324 HARISH ZADE

Quiz: Brain On Fire

Electrical Engineering Quiz – 10 Questions with Answers

1. What is the standard frequency of AC power supply in India?

A) 40 Hz B) 50 Hz C) 60 Hz D) 100 Hz

Answer: B) 50 Hz

2. Which principle is used in the operation of a transformer?

A) Electrostatic induction B) Self-induction only C) Mutual induction D) Piezoelectric effect

Answer: C) Mutual induction

3. Which motor is commonly used in electric vehicles due to its high efficiency and power density?

A) Universal motor B) Shaded-pole motor C) Permanent Magnet Synchronous Motor (PMSM) D) Hysteresis motor

Answer: C) Permanent Magnet Synchronous Motor (PMSM)

4. What is the primary function of an inverter in a solar photovoltaic system?

A) Convert AC into DC B) Convert DC into AC C) Increase solar irradiance D) Store electrical energy

Answer: B) Convert DC into AC

5. Which device is used to protect an electrical circuit against excessive current?

A) Capacitor B) Transformer C) Circuit breaker D) Rectifier

Answer: C) Circuit breaker

6. What is the main purpose of Maximum Power Point Tracking (MPPT) in a solar PV system?

A) Reduce the panel temperature B) Increase the operating frequency C) Extract maximum available power from solar panels D) Convert AC into DC

Answer: C) Extract maximum available power from solar panels

7. Which power semiconductor device is widely used in medium- and high-power inverter applications?

A) Zener diode B) IGBT C) Photodiode D) LED

Answer: B) IGBT

8. What is the synchronous speed of a four-pole induction motor supplied at 50 Hz?

A) 750 rpm B) 1000 rpm C) 1500 rpm D) 3000 rpm

Answer: C) 1500 rpm

9. Which technology allows an electric vehicle to supply electrical energy back to the power grid?

A) MPPT B) Vehicle-to-Grid (V2G) C) Pulse Width Modulation (PWM) D) Maximum Demand Control

Answer: B) Vehicle-to-Grid (V2G)

10. What is the main advantage of a smart grid compared with a conventional electrical grid?

A) Eliminates the need for transformers B) Operates only with DC power C) Enables real-time monitoring and bidirectional communication D) Eliminates all transmission losses

Answer: C) Enables real-time monitoring and bidirectional communication

◆ CREDITS

Editorial Team & Acknowledgements**ACKNOWLEDGEMENTS**

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