APRIL-2021

ELECTREE

MAGAZINE

VOLUME-3 Issue-1

ELECTRICAL & ELECTRONICS ENGINEERING

St. JOHNS COLLEGE OF ENGINEERING & TECHNOLOGY

Accredited by NAAC, Approved by AICTE, Recognized by UGC under 2(f) & 12(B), An ISO 9001:2015 Certified Institution and Affiliated to JNTUA, Anantapuramu

Estd: 2001

Yerrakota, YEMMIGANUR - 518360, Kurnool Dt., Andhra Pradesh.

From the Management

Sri. A.V. RAMANA REDDY

It is always a pleasure to be a part of a team which strives to bring out the talents of students and staff. Electrical and Electronics department of St. Johns College of Engineering & Technology has always been striving to keep itself ahead of the competition. The essential purpose of a magazine is to inform, engage, inspire and entertain a diverse readership including alumni, parents, students, faculty, staff and other friends of the college by telling powerful stories that present a compelling, timely and honest portrait of the college and its extended family. This magazine has made an earnest attempt in this direction and brought out certain aspects to the eyes of the public so that they may understand and know the EEE department even better.

Sri. K. PARVATH REDDY

Being part of a team dedicated to showcasing the talents of our students and staff is always a pleasure. The Electrical and Electronics Engineering (EEE) Department at St. Johns College of Engineering & Technology consistently strives to lead in excellence and innovation. Our magazine's core mission is to inform, engage, inspire, and entertain a broad audience, including alumni, parents, students, faculty, staff, and other friends of the college. We aim to share powerful stories that offer a compelling, timely, and honest depiction of the college and its vibrant community. This publication has made a sincere effort to highlight various facets of the EEE department, bringing them to the public's attention to enhance their understanding and appreciation of our department's achievements and initiatives.

Sri. K. RAMPULLA REDDY
DIRECTOR

Smt. K. ANASUYA
DIRECTOR

It's a privilege to be part of a team that works to highlight the talents of our students and staff. The Electrical and Electronics Engineering (EEE) Department at St. Johns College of Engineering & Technology continually strives to stay at the forefront of excellence. Our magazine is designed to inform, engage, inspire, and entertain a wide-ranging audience, including alumni, parents, students, faculty, staff, and other friends of the college. We aim to tell impactful stories that provide a compelling, timely, and authentic portrayal of the college and its extended community. This issue has sincerely endeavoured to bring various aspects of the EEE department into the spotlight, helping the public gain a deeper understanding and appreciation of our department's endeavours and accomplishments. Through articles, interviews, and features, we aim to capture the spirit of innovation and dedication that defines our department. We believe that by sharing these stories, we can foster a stronger connection within our community. We hope you find this magazine both informative and inspiring as it reflects the hard work and creativity of our EEE department. Your support and feedback are invaluable to us, and we encourage you to share your thoughts. Together, we can continue to drive progress and celebrate the achievements of our remarkable community.

From the Principal

Dr. V. Veeranna

It is always a pleasure to be a part of a team which strives to bring out the talents of students and staff. Electrical and Electronics department of RVR&JC College of Engineering has always been striving to keep itself ahead of the competition. The essential purpose of a magazine is to inform, engage, inspire and entertain a diverse readership including alumni, parents, students, faculty, staff and other friends of the college by telling powerful stories that present a compelling, timely and honest portrait of the college and its extended family. This magazine has made an earnest attempt in this direction and brought out certain aspects to the eyes of the public so that they may understand and know the EEE department even better.

From the HOD of EEE

Dr. K. Chithambaraiah Setty

I am delighted to recognize the high quality and taste of the magazine produced by our EEE department. Heartfelt congratulations to the entire editorial team for their exemplary work. It has been a great pleasure to read the remarkable contributions made by our students.

This magazine serves as a platform to uncover the hidden literary talents of our students and to nurture leadership skills among them. It is encouraging to see the diverse range of topics covered and the creativity displayed in each piece. The dedication and hard work of the editorial team and contributors are truly commendable.

ABOUT THE DEPARTMENT:

The Electrical & Electronics Engineering Department was established in the year 2001 with an intake of 60. The Department has qualified, dedicated, experienced and trained faculty with deep sense of commitment towards the Students and Institution .the Department of Electrical & Electronics Engineering is dedicated to the current needs of industry with the flexibility to tune its programmes according to different requirements. Application of new technology in various fields is one of the main focuses in the activities of the department. Develop skilled engineers to meet industry needs and hence develop responsible citizens for our country and society.

The use of electricity is fundamental to modern life and without a secure supply, society in its current form would collapse. Consequently, the importance of efficient and sustainable generation, secure distribution, and intelligent user devices cannot be overstated. This will be a lifetime challenge facing the next generation as traditional sources of energy will run out and new ways of generating, distributing and using electricity must be sought. Electrical and Electronic Engineers have a vital role in addressing this challenge.

Infrastructure facilities include well equipped laboratories such as Electrical Machines laboratory, Power Systems and simulation Laboratory, Circuits and Networks laboratory, Control Systems laboratory, Electrical Measurements laboratory, Power Electronics Laboratory, Electrical workshop and Departmental Library.

Our vision:

To become a front-runner, the department of Electrical and Electronics Engineering brings out competent engineers, innovators, researchers with human and ethical values, thereby contributing value to the knowledge-based economy and society.

Our Mission:

- To educate and train engineers who are highly skilled, innovative, and committed to ethical values.
- To encourage research and innovation, fostering a culture of curiosity and creativity among our students.
- To produce graduates who make a positive impact on the knowledge-based economy and society as a whole by using their knowledge and values to solve real-world problems.

Program Outcomes:

Engineering Graduates will be able to:

PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
PO6	**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO7	**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one‟s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments
PO12	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

Program Specific Outcomes (PSOs) of EEE Department:

PSO1: Able to utilize the knowledge of high voltage engineering in collaboration with power systems in innovative, dynamic and challenging environment, for the research based team work.

PSO2: Able to explore the scientific theories, ideas, methodologies and the new cutting edge technologies in renewable energy engineering, and use this erudition in their professional development and gain sufficient competence to solve the current and future energy problems universally.

PSO3: Able to provide socially acceptable technical solutions to complex electrical engineering problems with the application of modern and appropriate techniques for sustainable development.

Program Educational Objectives

- **PEO1:** To Excel in professional career and/or higher education by acquiring knowledge in mathematics and Basic Sciences, Basic Electrical Sciences, Power Systems, Power Electronics and Electrical Drives

- **PEO2:** To identify the problems in society and design electrical systems appropriate to its solutions using soft controllers that are technically sound, economically feasible and socially acceptable.

- **PEO3:** To Exhibit professionalism, ethical attitude, communication skills, team work in their profession and adapt to current trends in technology by engaging in continuous professional development.

SMART GRID INFRASTRUCTURE IN INDIA

Frost & Sullivan has projected that the majority of the investment will be for transmission enhancement products and solutions like superconductors, Flexible Alternating Current Transmission Systems (FACTS), High- Voltage Direct Current (HVDC), automatic recovery systems etc. This area is expected to grow at a CAGR of 5%-6% over the next decade. The next largest investment is expected to be in electric charging infrastructure and customer side systems like batteries, inverters, energy billing systems, smart Grid-to- Vehicle charging (G2V) etc. The electric charging and customer side systems products and solutions are expected to grow at a CAGR of 13.6% through CY 2030. Advanced metering infrastructure, which was the key component across pilot smart grid projects, is expected to grow faster, with a CAGR of 34% through 2025 and CAGR of 20% until 2030. India is expected to install more than 250 million smart meters by 2025. Other products and solutions of smart grids like distributed grid management, wide-area monitoring and control, and ICT integration are expected to grow at a CAGR of 16%, 19%, and 23% respectively.

Diverse stakeholder-related challenges: The scope of smart grid projects and associated stakeholders are not uniform, including transmission- and sub-transmission-related smart initiatives driven by PGCIL (Power Grid Corporation of India Limited), smart meter rollouts managed by over 120 distribution companies that are under huge financial stress and other initiatives driven by NSGM (National Smart Grid Mission).

Technology gaps and project implementation challenges: Smart grid projects have higher capital costs due to lack of experience of the bidders, who end up allocating disproportionately high costs toward contingencies. There is a lack of awareness when it comes to the usage of relevant technology solutions.

- Cost and capital-related issues: Commercial terms for many smart grid bids and qualification requirements are complex and difficult to fulfill, even by reputed power sector players.
- Lack of long-term asset management: Long-term maintenance of smart assets is a challenge.

To address the above-mentioned challenges, companies have to position themselves as an end-to-end solution and service provider for smart grid projects through strategic partnerships – and offer integrated solutions and service offerings, including Operation and Maintenance (O&M) support for smart grids. Addressing challenges of utilities in the process of digitalization and having the long-term vision to integrate the smart grid into the smart ecosystem will be the key for companies operating in this space.

As per Frost & Sullivan's analysis, power utilities will be the single largest target segment for smart grid products/solutions, which require integrated smart grid solutions and service offerings along with O&M support. There is a need for utility 3.0 transformation and platform solutions that cater to specific smart grid needs like energy trading/exchange, smart meter standard interoperability, etc. Another area of focus will be enabling two-way communication between supply and demand and an IT-based Electric Vehicle (EV) operating interoperability platform for industrial, residential, commercial, EV infrastructure.

Currently, suppliers of products and solutions for the smart grid industry are dominated by platform providers primarily IT solution providers that form a consortium with communication system integrators and equipment suppliers. Key components required to cater to smart grid projects are device/product manufacturing, system integration, software/platform development, and communication technology providers.

There is abundant scope for leading global players and companies from Asia, Europe, and North America that have participated in pilot smart grid projects and grid upgradation projects. International companies are looking for Joint Ventures (JVs) to participate in large-scale smart grid projects to be rolled out in the coming years. Apart from large meter manufacturing companies like Schneider Electric, L&T, Genus Power, HPL India, Itron India, Secure Meters, Landis + Gyr, Elster, etc., large system integrators that constitute key bidders in almost all smart grid projects, including Hitachi, GE, Siemens, Capgemini, Wipro, Cyan, Accenture, CDAC, Cisco, Enzen, Analogics, Synergy, Chemtrols and Fluentgrid, either have JVs or tie- ups with product/solutions or software developers to provide complete solutions for smart grid projects. Apart from the private companies, ECIL (Electronics Corporation of India Limited), a government of India enterprise, is also involved in the implementation of smart grid projects.

Companies catering to public and private utility companies need to provide the complete package of smart grid products and solutions, including wide-area monitoring and control, ICT integration, transmission enhancement, distribution grid management, advanced metering infrastructure, electric vehicle charging infrastructure and cyber and network security solutions. Smart grid solutions for industrial customers require distribution grid management, EV charging infrastructure, customer-side systems, and cyber and network security solutions. Residential and commercial building end-users need only EV charging infrastructure and customer side systems and solutions like smart appliances, routers, in- home displays, building automation systems, energy management systems, etc., as part of smart grid projects. Prosumers are the latest emerging customer segment for smart

grids in India, creating huge opportunities in the Indian smart grid space over the next decade.

The smart grid products and solutions market is driven by government initiatives like large- scale smart metering roll-out – and implementation of advanced metering infrastructure; a government target of achieving 175 GW of renewable energy capacity by 2022, which is further expected to grow to 500 GW by 2030; 100 smart city projects supporting smart grid initiatives; and the government's intention to replace all conventional electricity meters with prepaid smart meters in the next three years, which is a sub-component of the smart grid project.

As per Frost & Sullivan's analysis, to achieve success in the smart grid industry, companies need to adopt the following strategies:

Identify your target geographies (where to sell) for the near and long terms. In the near term, the focus should be on:

- National grid operator Power Grid Corporation of India Ltd (PGCIL) and National Smart Grid Mission (NSGM)-driven projects.
- Progressive state utilities driving smart grid initiatives (Gujarat, Maharashtra, Telangana, Tamil Nadu, and Karnataka).
- Private distribution utilities like Reliance Infrastructure (Delhi) and Tata Power(Mumbai) and CESC (West Bengal)

In the long term, the focus should be on non-utility business segments like industries, residential and commercial EV charging infrastructure, etc.

Cool Facts About Electricity

- Bhadla Solar Park is the world's largest solar park located in India which is spread over a total area of 14,000 acres in Rajasthan, India. The park has total capacity of 2.245 MW. In 2018 it had commissioned India's cheapest solar power.
- Electricity travels at 6,696,000 miles per hour.
- Electricity plays an important role in the way your heart functions. Muscle cells in the heart are contracted by electricity that runs through your body. Electrocardiogram (ECG) machines are used in hospitals to measure the electricity flowing through a patient's heart, displaying a line that spikes with every heartbeat.

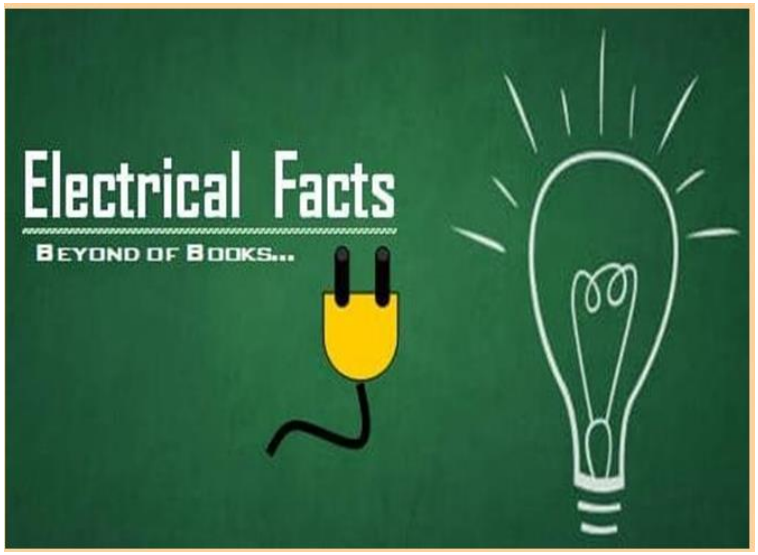
- The typical lightning bolt packs 100 million volts.
- The average taser emits 50,000 volts.
- A spark of static electricity can measure up to 3,000 volts.
- Electric eels can produce shocks of 500 volts or more.

The first successful electric car was built in 1891 by American inventor William Morrison.

- Benjamin Franklin didn't discover electricity, but he did prove that lightning is a formof electricity.

- Ever wondered why birds that sit on power lines don't get electrocuted? If a bird sits ononly one power line it's safe. If the bird touches any part of its body to another line, it creates a circuit, causing electrocution.
- Electricity is sometimes used as electroconvulsive therapy (ECT), where patients are given electrically induced seizures in order to treat psychiatric illnesses.
- In the 1880's, there was a "war of currents" between Nikola Tesla and Thomas Edison. Tesla helped invent AC current and Edison helped invent DC current, and both wanted their currents to be popularized. AC won the battle because it's safer and can be usedover longer distances.
- Iceland is the country that uses the most electricity annually. Their consumption is about 23% more than the U.S.

- The first street in the world to be lit by electric light bulbs was Mosley Street, Newcastle upon Tyne, in 1879.
- A spark of static electricity can measure up to 3,000 volts.

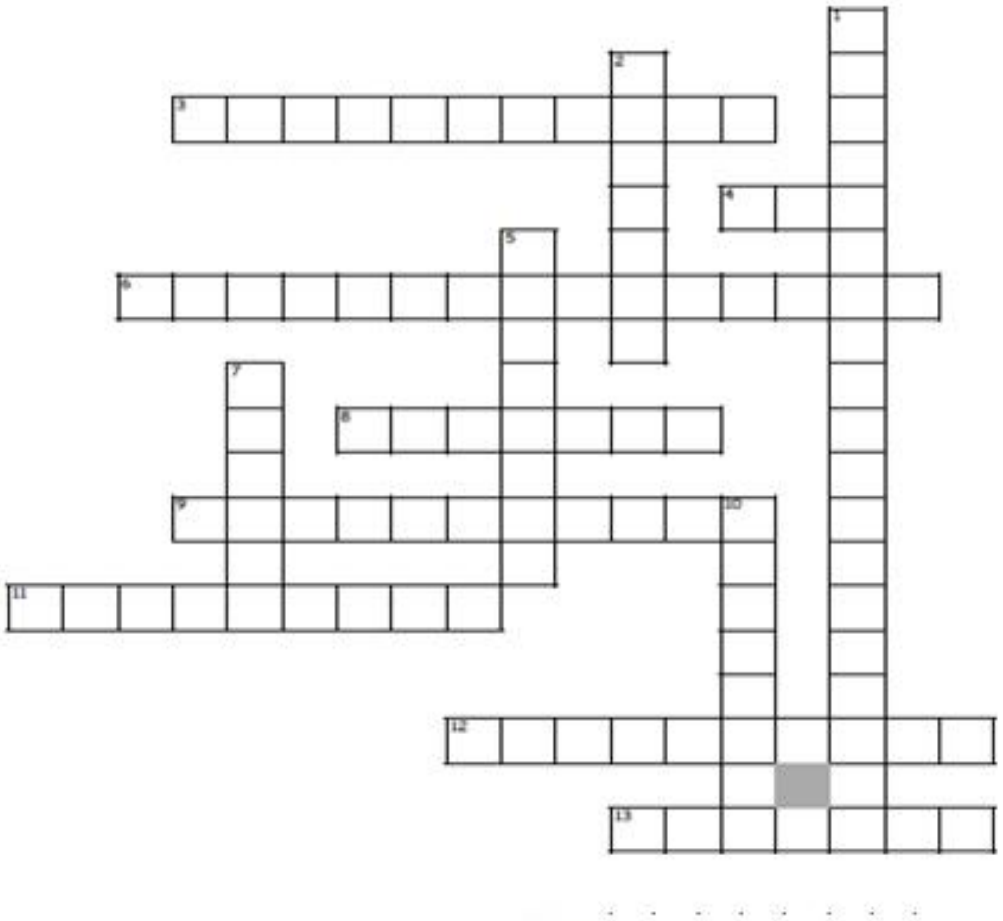


- A typical microwave oven consumes more electricity powering its digital clock than it does heating food
- The internal skin has the very low resistance. It's resistance range would be 300-1000 ohm. Our outer skin is a very bad conductor because of the dead and dry cells lying over the tissues depending on individual person the resistance would vary from 1000 to100,000 ohm.
- The world’s biggest light bulb is located in Edison, New Jersey. It’s 14 feet tall, weighs eight tons, and sits on top of the Thomas Edison Memorial Tower.
- Electricity is present in our bodies; our nerve cells use it to pass signals to our muscles.

Pencil Sketch By Our Student

G. VISHWANATH

Electrical Cross Puzzle



Across

3. a form of energy resulting from the existence of charged particles

4. an atom or molecule with a net electric charge due to the loss or gain of one or more electrons

6. a closed circuit in which the current divides into two or more paths before recombining to complete the circuit

8. an electromotive force or potential difference expressed in volts

9. A device used to transfer electrical energy from one circuit to another

11. a force that acts at a distance due to a magnetic field

12. a hindrance to the flow of a charge

13. a flow of electric charge

Down

1. the difference of electrical potential between two points

2. the complete path around which an electric current flows

5. a stable subatomic particle that is found in atoms with a charge of negative electricity

7. is a characteristic of a unit of matter that expresses the extent to which it has more or fewer electrons than protons

10. an electronic component that is designed to offer a desired amount of resistance to the flow

ACTIVITIES:

FRESHERS PARTY

FAREWELL PARTY

AWARENESS CAMPAIGN

SUBSTATION VISIT

Magazine Review Committee

STAFF

1. **Dr. K. Chithambaraiah Setty, HOD, EEE**
2. **Mr. Syed Saheb**

STUDENTS

1. **G. VISHWANATH –IV EEE**
2. **K.C. VINAY – III EEE**