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ELECTREE

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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.

Counseling Code: JONY

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 endeavored to bring various aspects of the EEE department into the spotlight, helping the public gain a deeper understanding and appreciation of our department's endeavors 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.

Toppers (2018-22 Batch):

To The TOPPERS of Batch 2018-22 B. Tech EEE

C. BALAKRISHNA

Regd.No: 19G35A0201

Percentage: 82.31%

D. RAJESHWARI

Regd.No: 18G31A0203

Percentage: 81.49%

M. HEMAVATHI

Regd.No: 18G31A0213

Percentage: 77.61%

Artificial Intelligence in Power Systems

Artificial Intelligence (AI) has been increasingly applied to power systems to enhance efficiency, reliability, and sustainability. Here are several aspects where AI is making an impact in power systems.

Grid Optimization: AI algorithms help in optimizing the operation of power grids by predicting electricity demand and managing the distribution of energy.Smart grids with AI capabilities enable real-time monitoring and control of energy flow, improving overall grid reliability.

Energy Forecasting: AI is utilized for accurate short-term and long-term energy forecasting. Machine learning models can analyze historical data, weather patterns, and other variables to predict energy demand and supply.

Fault Detection and Diagnostics: AI systems can detect faults and anomalies in power systems by analyzing data from sensors and devices. This helps in identifying and addressing issues before they lead to outages.

Predictive Maintenance: AI algorithms predict equipment failures and recommend maintenance schedules based on the condition of power system components. This approach minimizes downtime and extends the lifespan of equipment.

Energy Management Systems: AI is employed in energy management systems to optimize the scheduling and dispatch of energy resources, including renewable sources and energy storage.

Demand Response: AI facilitates demand response programs by predicting peak demand periods and adjusting energy consumption accordingly. This helps in balancing the grid and avoiding overloads.

Renewable Energy Integration:

AI algorithms help integrate renewable

energy sources like solar and wind into the power grid more efficiently by forecasting energy production and adapting to their variable nature.

Cybersecurity: AI is used for enhancing cybersecurity in power systems by detecting and preventing cyber threats. It can identify unusual patterns in network traffic and prevent unauthorized access.

Voltage and Reactive Power Control: AI algorithms optimize voltage and reactive power control, ensuring that the power system operates within specified limits and minimizing losses.

Energy Trading: AI is applied in energy trading platforms to analyze market trends, predict prices, and optimize trading strategies.

Decentralized Energy Systems: AI plays a crucial role in managing decentralized energy systems, including microgrids and distributed energy resources, to balance supply and demand locally.

Load Forecasting: AI models predict the future electricity consumption patterns, helping utilities plan for capacity expansion and optimize resource allocation.
The integration of AI into power systems brings about a transformation in the way electricity is generated, distributed, and consumed. It contributes to the development of smarter, more resilient, and sustainable energy infrastructure.

Facts about Electricity

Understanding these facts can give you a deeper appreciation for the role electricity plays in our lives and the fascinating phenomena associated with it.

- **Benjamin Franklin Didn't Discover Electricity:** He conducted experiments and proved that lightning is a form of electricity, but he didn't "discover" electricity. Electricity was known long before Franklin's kite experiment.

- **Electricity Travels at the Speed of Light:** In a vacuum, the speed of electricity, or the flow of electrons, travels at the speed of light, which is about 186,000 miles per second (299,792 kilometers per second).

- **The First Power Plant:** The first centralized power plant was built in 1882 by Thomas Edison in New York City. It used a direct current (DC) system to power around 85 customers.

- **Electricity and Magnetism are Connected:** They are two aspects of the same fundamental force called electromagnetism. Changing magnetic fields create electrical currents and vice versa.

- **AC vs. DC:** Nikola Tesla and Thomas Edison had a famous debate about alternating current (AC) and direct current (DC). AC won out due to its ability to be transmitted over long distances more efficiently.

- **Human Body Conducts Electricity:** The human body is a conductor of electricity. That's why it's essential to be careful around live electrical circuits to avoid electric shock

- **Electric Eels Generate Electricity:** Electric eels can generate electric shocks of up to 600 volts to stun prey or defend themselves. They have specialized cells that act as tiny batteries.

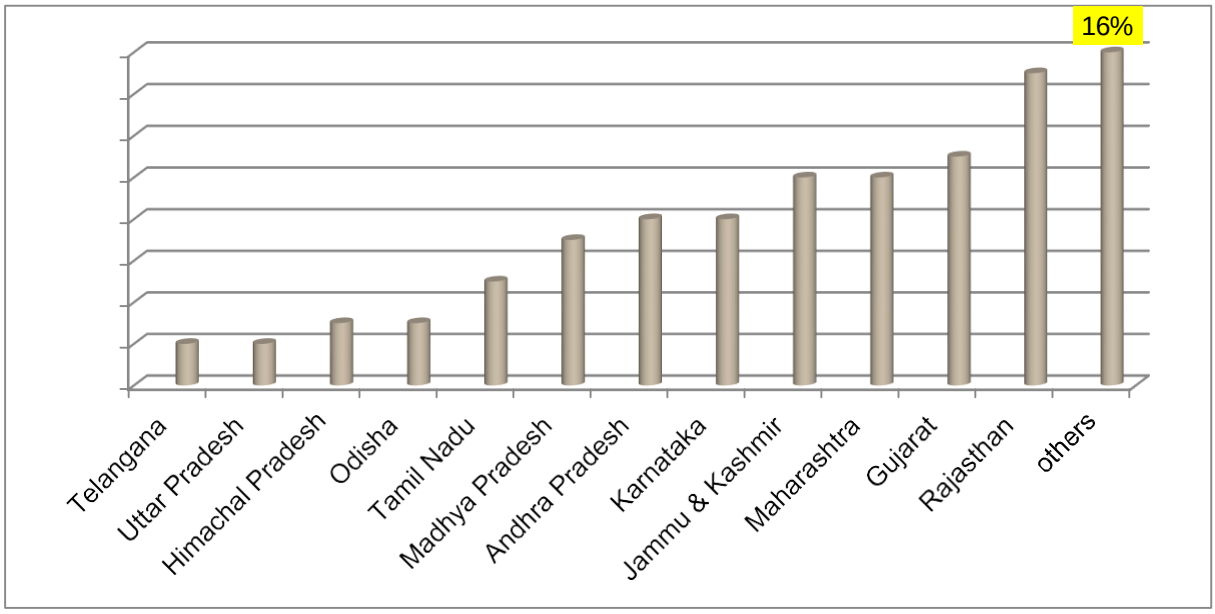
- **Lightning Strikes:** Lightning is a discharge of electricity in the atmosphere. A typical lightning bolt can release enough energy to light a 100-watt bulb for more than three months.

- **Power Grids are Interconnected:** Power grids connect multiple power plants to users. These grids ensure a continuous flow of electricity and provide backup in case of outages.

- **Electrical Resistance Generates Heat:** When electricity encounters resistance in a wire, it generates heat. This principle is used in many electrical appliances like toasters and electric heaters.

Renewable Energy Sources Scenario

India is one among the maximum renewable energy utilizing country. It secures fourth position in renewable energy market all over the world. From the records as of 2018, in wind Power India ranked fourth and fifth in both solar as well as renewable power installed capacity. To reach 15,820 TWh by 2040, Indian government in-creased support to investors in renewable energy generation. By 2022, India has an aim to reach renewable energy of 225 Giga Watt with solar contribution of 114 Giga Watt and wind power contribution of 67Giga Watt. By 2030, India has a goal to increase the same to 500 Giga Watt.

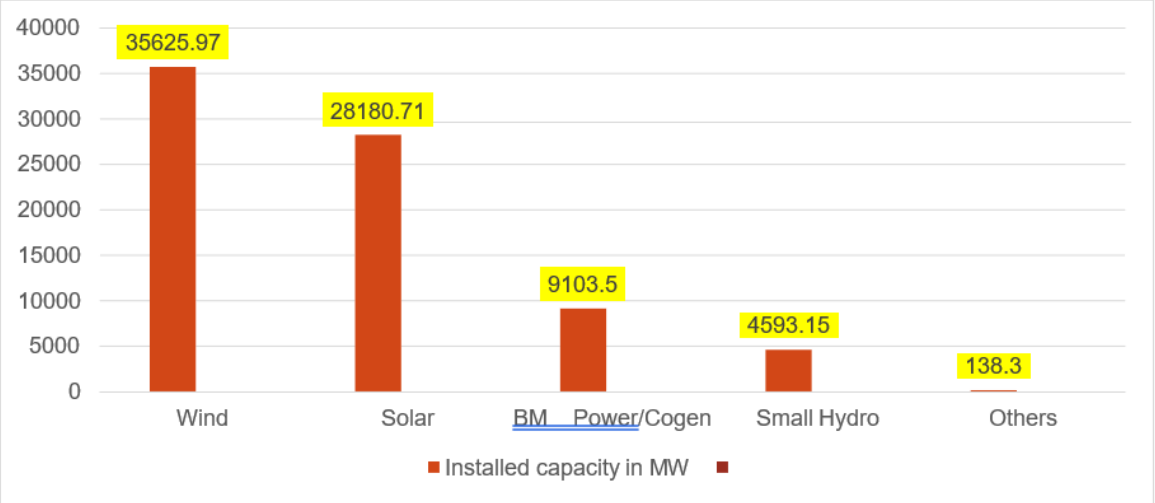


Renewable Power Generation in India

The growth in generation of power by renewable energy sources from 2014-15 to 2018-19 is given in Table. The installed capacity of renewable energy sources in megawatt in terms of wind, solar, biomass, small hydro and others till March 2019 can be visualized in below Figure. It can be seen in the figure that, with 35625.97MW wind contribution is maximum among other sources.

Years	Generation from RES (BU)	Year-wise growth (%)
2014-15	61.72	
2015-16	65.78	6.58
2016-17	81.55	23.97
2017-18	101.84	24.88
2018-19	126.76	24.47

Growth in generation of power by renewable energy sources from 2014-15 to 2018-19.



Renewable Installed Capacity till March 2019

Energy is very important aspect for development of any country. Reliable availability of energy is one of the measures in the growth of the country. This paper gives a brief analysis on conventional and non-conventional energy generation situation in India. The present situation of energy generation in India needs some improvements to overcome the difficulties like unreliability, Shortages and more charges for industrial consumers. To meet the present and future needs, India should have clear Strategy for the use of best possible options available in terms of short term and long term goals. To promote renewable power generation, both central and state governments are attracting the users by giving best policy. This paper provides some policies and initiations from the government to raise the growth rate of renewable power generation in India. These policies also help in providing employment opportunities along with cleaner energy. This momentum need to be maintained by India to attain a target of reaching 70% energy generation from renewable sources by 2050.

GOVERNMENT INITIATIVES & GROWTH OF RENEWABLE ENERGY

To support to renewable energy sector, government of India launches some initiatives as given below:

- Solar equipment factories are offered land near its ports to companies by the government of India in August 2020.

- By exempting solar energy from electricity duty, Rajasthan government pro-moting usage of renewable power in farming and various sectors. The same is Placed in Budget 2019-20 bill.

- Delhi government took initiation to establish 5,000 KW solar park by shutting down thermal power station in Rajghat.

- Indian Government also desires to establish 30 Giga Watt solar energy Plant beside the deserts in Gujarat and Rajasthan.

- To decrease the cost of setup and increase the usage of solar power, the minis-try of India give benefits to solar roof top sector by reducing custom and excise duty.

- By 2030, the government of India plans to establish 500 Giga Watt renewable energy plants
- The developers of energy by solar cells and modules are provided solar power tariff cap at 2.5Rs and 2.68Rs for domestic and imported by MNRE in August 2018.
- Solar Energy Corporation of India (SECI) promotes large auctions for solar parks and granted 47 parks with a capacity of 25GW.
-
- Under Central Public Sector Undertaking (CPSU)-II phase scheme, vikram so- lar taken a 300 MW solar plant development with cost of Rs 1,750 crore from NTPC, India.
-
- By 2025, Adani Group from India aims to reach the world's largest renewable energy firm.
-
-

- From private companies, about Rs 36,729.49 cr. investments are recorded in India from April-Dec 2019 by in renewable energy sector.

- NTPC announced to invest Rs 50,000 crore on solar energy to increase the capacity of solar power generation by 10 GW in December 2019.

- In Uttar Pradesh, ReNew Power and ShapoorjiPallonji wish to invest nearly 750 crore for 150 MW floating solar power project.

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

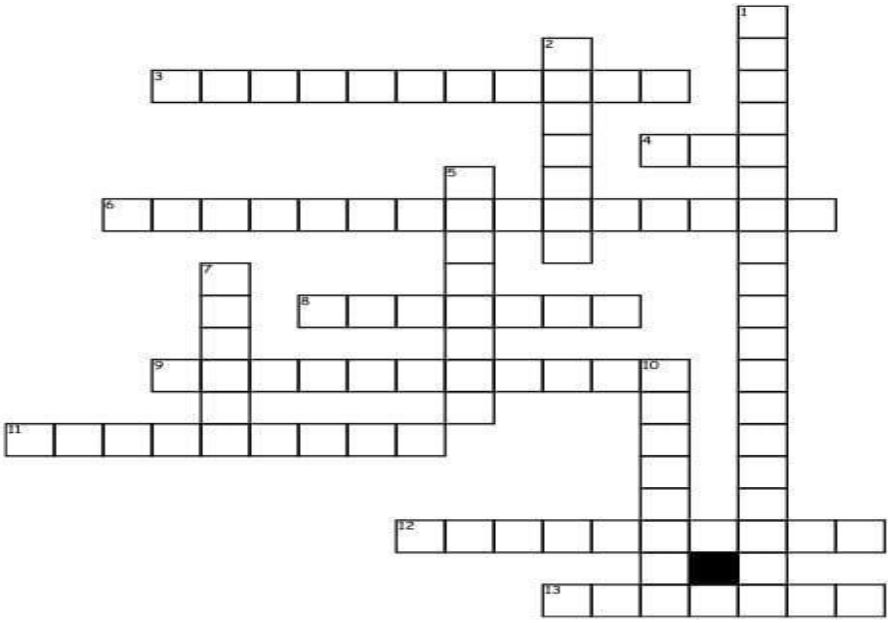
12. a hindrance to the flow of a charge

13. a flow of electric charge

Down

1. the difference of electrical potential between two points

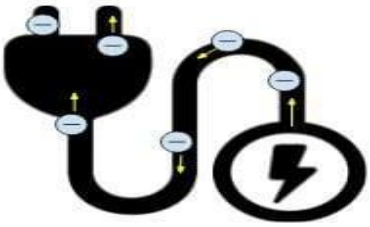
2. the complete path around which an electric current flows



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

PROJECTS:

HYBRID POWER PLANT

Industrial Visits

Srisailam Right Bank Power House
(7x110 mw), SRISAILAM

Magazine Review Committee

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