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ELECTRICAL DIGEST

LEARN | INNOVATE | ADVANCE

GEETHANJALI INSTITUTE OF SCIENCE AND TECHNOLOGY

HALF YEARLY ELECTRICAL MAGAZINE

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V. Raviteja(202U1A0241)

VISION-MISSION

VISION

To emerge as a competent learning centre producing prospective Engineers

MISSION

DM1: Provide conceptual and practical education through effective teaching-Learning strategies

DM2: Establish adequate Infrastructural support for enhanced learning

DM3: Interact with industry for upgrading professional skills including smart grid.

DM4: Organise personality development activities for imbibing life skills and ethical values

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

Graduates of B.Tech., in Electrical and Electronics Engineering program shall able to

PEO1: Analyse and solve real world Electrical and Electronics Engineering problems by applying modern engineering concepts.

PEO2: Pursue professional career or research.

PEO3: Demonstrate Excellence in multi-disciplinary teams through effective inter personal skills and ethical behaviour.

PEO4: Engage in continuous learning and adapt to the ever-evolving requirements of profession & society.

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Electrical Power Generation

Electricity generation is the process of generating electric power from sources of primary energy. For utilities in the electric power industry, it is the stage prior to its delivery (transmission, distribution, etc.) to end users or its storage (using, for example, the pumped-storage method).Usable electricity is not freely available in nature, so it must be "produced" (that is, transforming other forms of energy to electricity). Production is carried out in power stations (also called "power plants"). Electricity is most often generated at a power plant by electromechanical generators, primarily driven by heat engines fueled by combustion or nuclear fission but also by other means such as the kinetic energy of flowing water and wind. Other energy sources include solar photovoltaics and geothermal power. There are also exotic and speculative methods to recover energy, such as proposed fusion reactor designs which aim to directly extract energy from intense magnetic fields generated by fast-moving charged particles2 generated by the fusion reaction (see magnetohydrodynamics).

Ch. Sravya(202U1A0204)

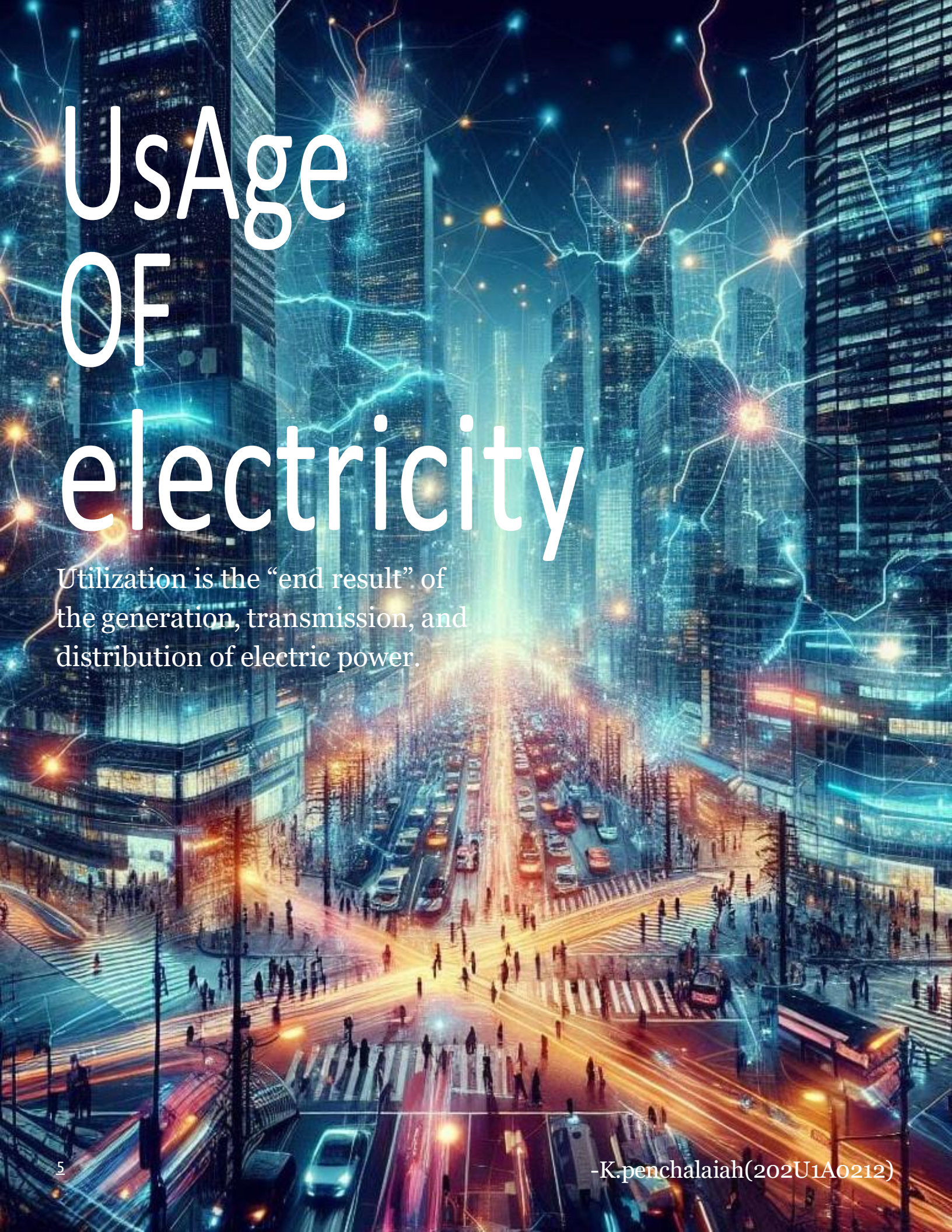
Electrical Power transmission

Electric power transmission is the bulk movement of electrical energy from a generating site, such as a power plant, to an electrical substation. The interconnected lines that facilitate this movement form a transmission network. Efficient long-distance transmission of electric power requires high voltages. This reduces the losses produced by strong currents. Transmission lines use either alternating current (AC) or direct current (DC). The voltage level is changed with transformers.

This is distinct from the local wiring between high-voltage substations and customers, which is typically referred to as electric power distribution. The combined transmission and distribution network is part of electricity delivery, known as the electrical grid.

Most North American transmission lines are high-voltage three-phase AC, although single phase AC is sometimes used in railway electrification systems. DC technology is used for greater efficiency over longer distances, typically hundreds of miles. High-voltage direct current (HVDC) technology is also used in submarine power cables (typically longer than 30 miles (50 km)), and in the interchange of power between grids that are not mutually synchronized. HVDC links stabilize power distribution networks where sudden new loads, or blackouts, in one part of a network might otherwise result in synchronization problems and cascading failures.Electricity is transmitted at high voltages to reduce the energy loss due to resistance that occurs over long distances. Power is usually transmitted through overhead power lines. Underground power transmission has a significantly higher installation cost and greater operational limitations, but lowers maintenance costs. Underground transmission is more common in urban areas or environmentally sensitive locations.Electrical energy must typically be generated at the same rate at which it is consumed. A sophisticated control system is required to ensure that power generation closely matches demand. If demand exceeds supply, the imbalance ca~~n cause generatio~~n plant(s) and transmission equipment to automatically disconnect or shut down to prevent damage. In the worst case, this may lead to a cascading series of shutdowns and a major regional blackout.

-D. Tirupathi(202U1A0210)



UsAge OF electricity

Utilization is the “end result” of the generation, transmission, and distribution of electric power.

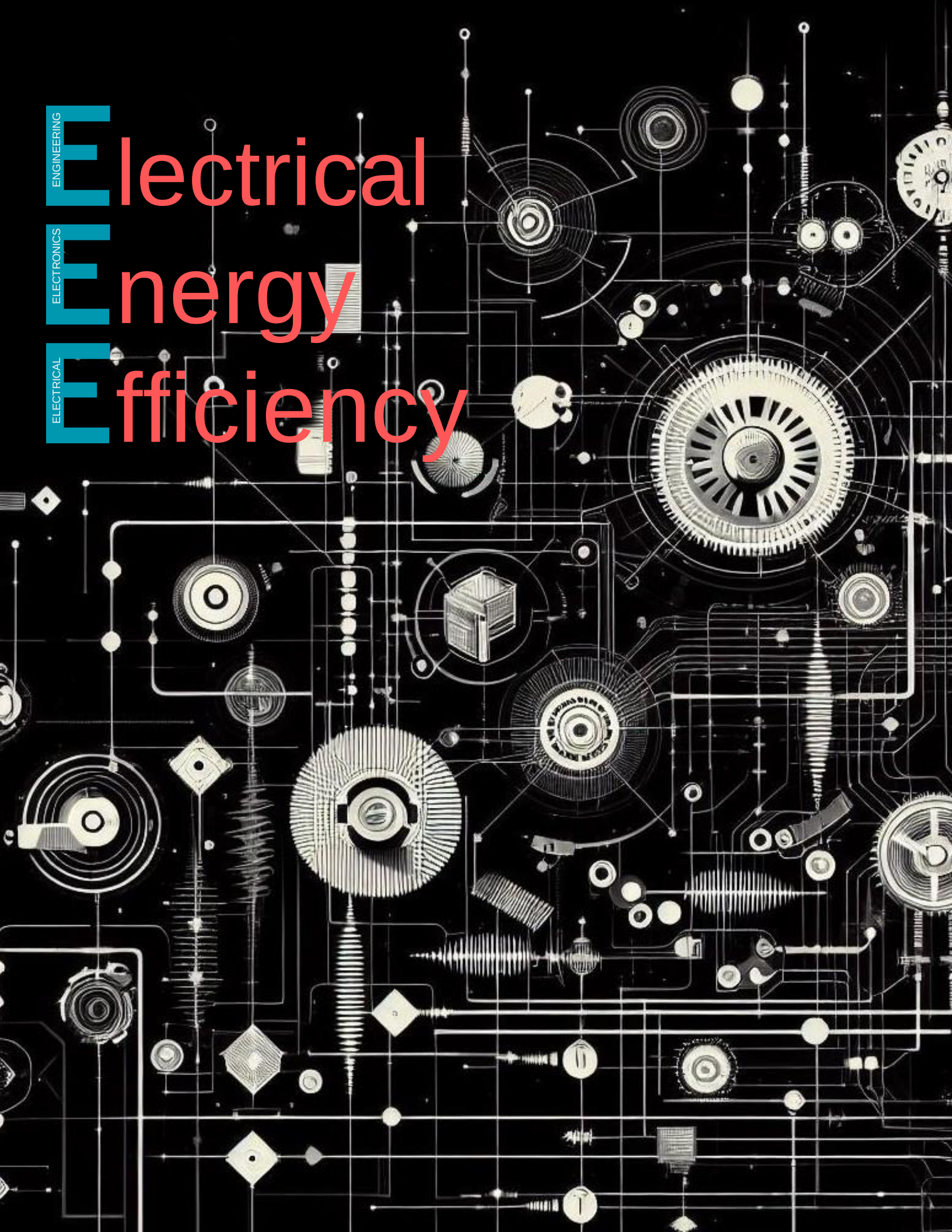
-K.penchalaiah(202U1A0212)

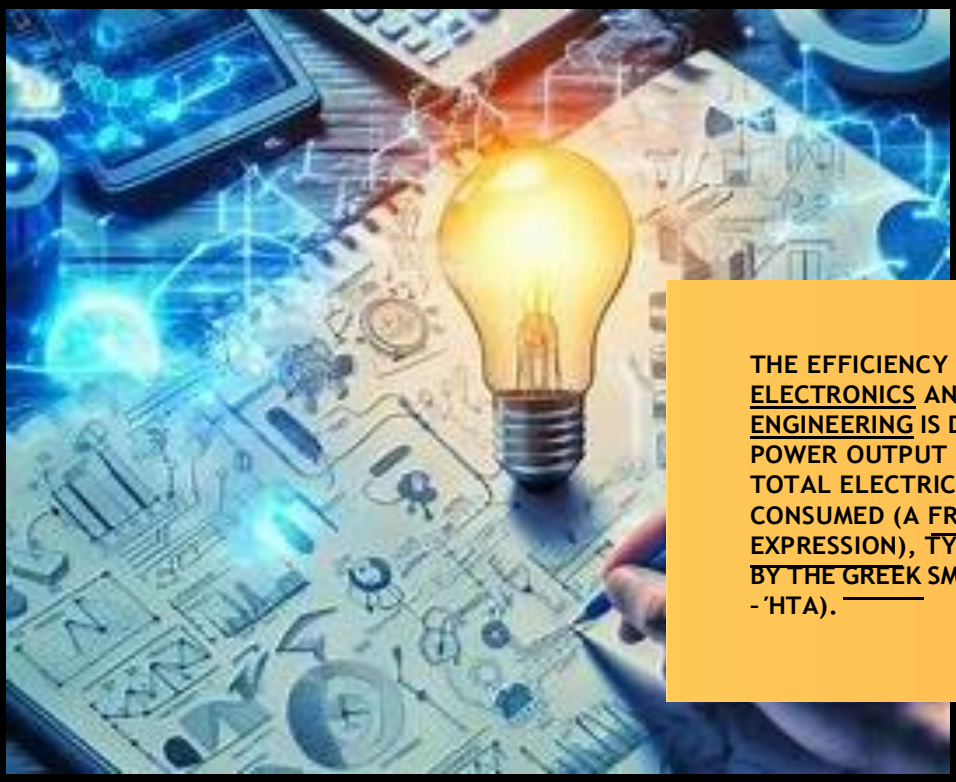
Electric energy consumption is energy consumption in the form of electrical energy. About a fifth of global energy is consumed as electricity: for residential, industrial, commercial, transportation and other purposes. Quickly increasing this share by further electrification is extremely important to limit climate change, because most other energy is consumed by burning fossil fuels thus emitting greenhouse gases which trap heat.The global electricity consumption in 2022 was 24,398 terawatt-hour (TWh), almost exactly three times the amount of consumption in 1981 (8,132 TWh). China, the United States, India and Japan accounted for more than half of the global share of electricity consumption.

Electricity accounted for more than 20% of worldwide final energy consumption in 2022, with oil being less than 40%, coal being less than 9%, natural gas being less than 15%, biofuels and waste less than 10%, and other sources (such as heat, solar electricity, wind electricity and geothermal) being more than 5%. The total final electricity consumption in 2022 was split unevenly between the following sectors: industry (42.2%), residential (26.8%), commercial and public services (21.1%), transport (1.8%), and other (8.1%; i.e., agriculture and fishing). In 1981, the final electricity consumption continued to decrease in the industrial sector and increase in the residential, commercial and public services sectors.

ELECTRICAL ELECTRONICS ENGINEERING

Electrical Energy Efficiency





EFFICIENCY OF ELECTRICAL ENERGY

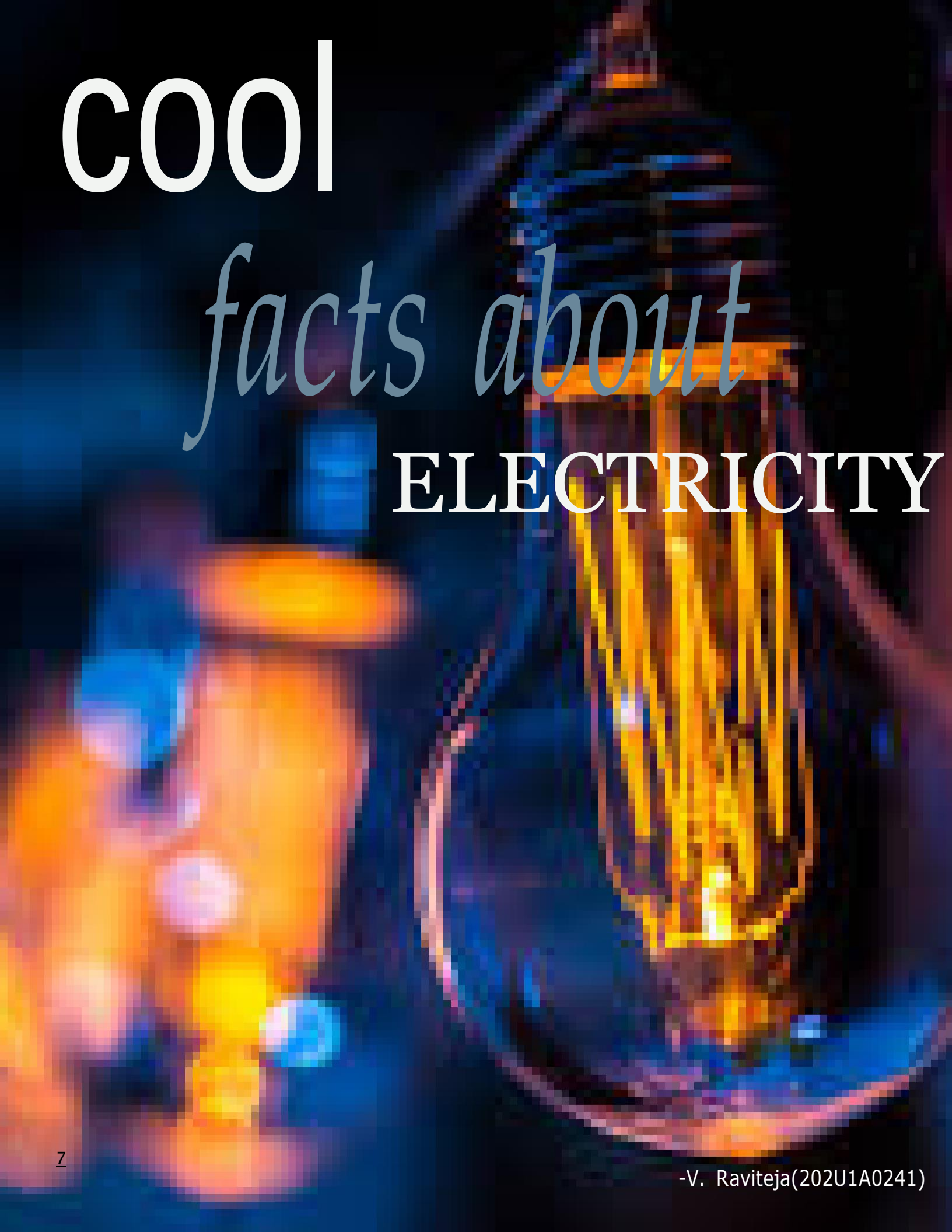
THE EFFICIENCY OF A SYSTEM IN ELECTRONICS AND ELECTRICAL ENGINEERING IS DEFINED AS USEFUL POWER OUTPUT DIVIDED BY THE TOTAL ELECTRICAL POWER CONSUMED (A FRACTIONAL EXPRESSION), TYPICALLY DENOTED BY THE GREEK SMALL LETTER ETA (H -'HTA).

Efficiency should not be confused with effectiveness: a system that wastes most of its input power but produces exactly what it is meant to is effective but not efficient. The term "efficiency" makes sense only in reference to the wanted effect. A light bulb, for example, might have 2% efficiency at emitting light yet still be 98% efficient at heating a room (In practice it is nearly 100% efficient at heating a room because the light energy will also be converted to heat eventually, apart from the small fraction that leaves through the windows). An electronic amplifier that delivers 10 watts of power to its load (e.g., a loudspeaker), while drawing 20 watts of power from a power source is 50% efficient. (10/20 × 100 = 50%)

Electric kettle: more than 90% (comparatively little heat energy is lost during the 2 to 3 minutes a kettle takes to boil water).
A premium efficiency electric motor: more than 90% (see Main Article: Premium efficiency).
A large power transformer used in the electrical grid may have efficiency of more than 99%. Early 19th century transformers were much less efficient, wasting up to a third of the energy passing through them.
A steam power plant used to generate electricity may have 30-40% efficiency.

As a result of the maximum power theorem, devices transfer maximum power to a load when running at 50% electrical efficiency. This occurs when the load resistance (of the device in question) is equal to the internal Thevenin equivalent resistance of the power source. This is valid only for non-reactive source and load impedances.

-N. Deekshitha(202U1A0218)



-V. Raviteja(202U1A0241)

01

Electricity travels at the speed of light, which is 186,000 miles per second.

02

Before electricity was a way of life, ancient Egyptians were aware that lightning and shocks from electric fish were very powerful. They used to refer to these fish as the “Thunderers of the Nile.”

03

When lightning strikes, it flows from the cloud to the ground, but the part we see is actually the charge going from the ground back up into the cloud.

04

Electricity can be created using water, wind, the sun, and even animal waste.

05

Electricity is sometimes used as electroconvulsive therapy (ECT), where patients are given electrically induced seizures in order to treat psychiatric illnesses.

06

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 used over longer distances.

07

Iceland is the country that uses the most electricity annually. Their consumption is about 23% more than the U.S.

08

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.

FUN ZONE

-Sk. Haseena(202U1A0230)

- Why did the electron go to therapy? It had too many negative charges! What's an electrician's favorite type of music? Shock and roll!
- Why did the scarecrow become an electrical engineer? Because he was outstanding in his field!
- How do you make a circuit laugh? Give it a good current joke!
- Why did the power outlet break up with the light bulb? It felt like they weren't sparking anymore!
- What do you call a group of musical resistors? A bandwidth!
- Why did the capacitor break up with the inductor? They had no mutual inductance!
- How do you organize a space party? You planet!
- Why did the electron bring a flashlight to the party? Because it
- wanted to light up the atom-sphere!


EVENTS

PERSONALITY DEVELOPMENT

Personality development is an essential aspect of education that helps students to develop their social, emotional, and intellectual skills. It is the process of enhancing one's personality traits, such as confidence, communication skills, leadership qualities, and positive attitude, to name a few. Personality development programs in educational institutes aim to provide students with the necessary tools and techniques to improve their overall personality.

In today's competitive world, personality development has become a crucial factor in determining one's success. Educational institutes play a vital role in shaping the personality of students. They provide a platform for students to learn and develop their skills, which will help them in their future endeavors.

Personality development programs in educational institutes focus on various aspects of personality development, such as communication skills, leadership qualities, time management, and stress management. These programs help students to develop their skills and abilities, which will enable them to face the challenges of the real world.

In conclusion, personality development is an integral part of education that helps students to develop their skills and abilities. Educational institutes should focus on providing

EMBEDDED SYSTEMS WORKSHOP

The department of Electrical and Electronics Engineering organized a five day Workshop on "EMBEDDED SYSTEMS for Electrical Engineering" from 28-02-2021 to 05-03-2021 by Mr. Suresh. S, Assistant Professor, S.A Engineering College, Chennai. The workshop provides skills on basic concepts related to programming of Embedded systems make the students gain the practical knowledge of building some real time applications like traffic control, automatic water filling tank, mobile app interface etc. Around 26 numbers of students from our department have registered for this program. The Principal of GIST, Prof. Dr. G.SubbaRao in the inaugural address mentioned the importance of real time use of embedded systems that is needed of the Applications for Electrical Engineering. Prof .TNVLN Kumar, Director felicitated the event and the certificates were distributed to the students. Dr.P. Vinoth Kumar, Associate Professor coordinated the workshop along with Dr.JaffarSadiq Ali, HoD EEEand Mr.M.Rajesh.