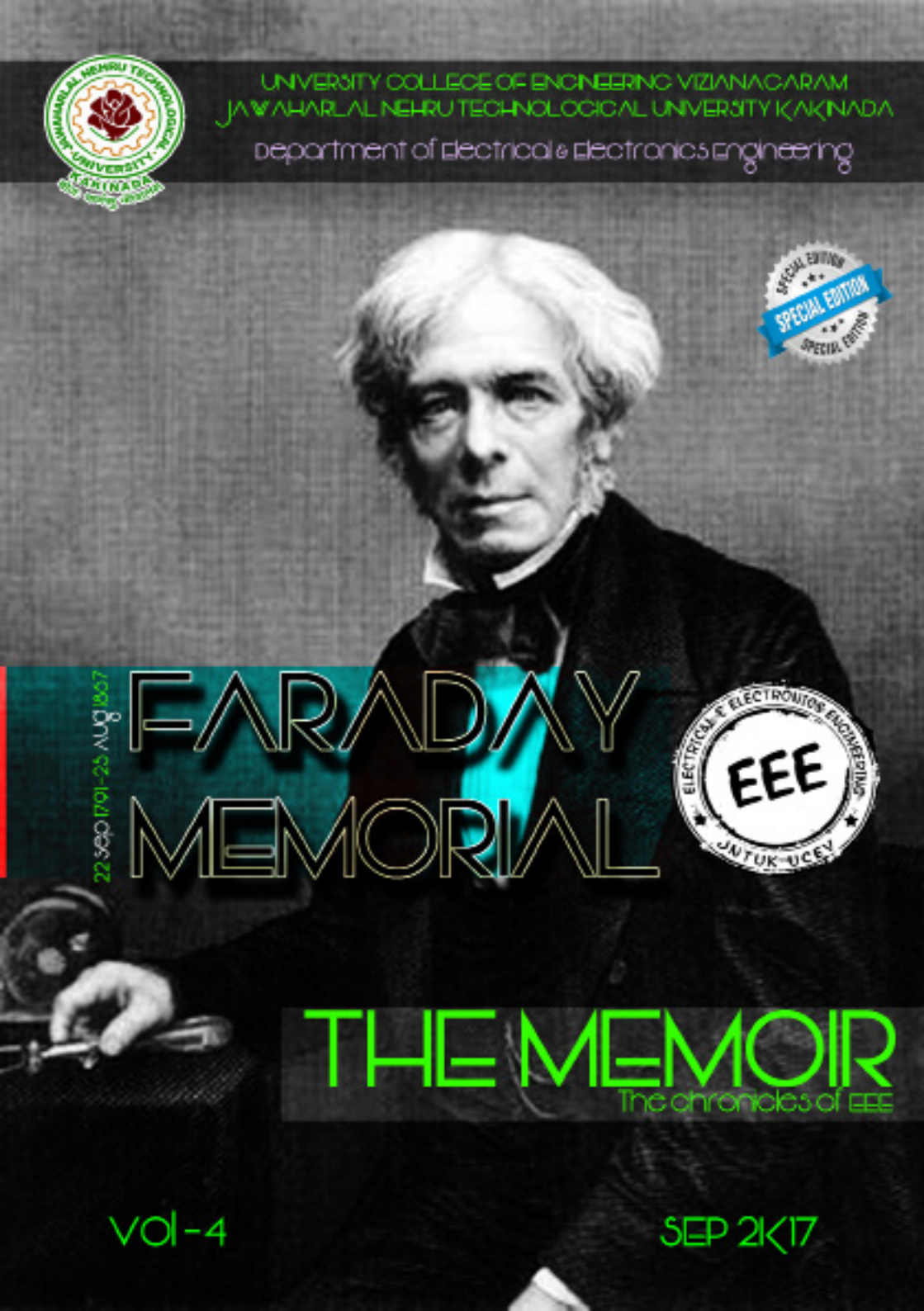
UNIVERSITY COLLEGE OF ENGINEERING VIZIANAGARAM
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
Department of Electrical & Electronics Engineering



SPECIAL EDITION

22 Sep 1791-25 Aug 1867

FARADAY MEMORIAL

ELECTRICAL & ELECTRONICS ENGINEERING
EEE
JNTUK-UCEV

THE MEMOIR

The chronicles of EEE

VOL-4

SEP 2K17


Let's Make Our World
More Green and Clean

Editorial Column

We take immense pleasure to thank all the readers our magazine for your support to our effort. We, depertment of Electrical and Electronics Engineering proudly presents the third edition of our magazine "THE MEMOIR- chronicles of eee".

We would like to take this opportunity to thank our Principal, Dr. V. Sreenivasulu and all our faculty of Electrical and Electronics Engineering depertment and our fellow students for their support in developing our magazine.

Dr.V.S. Vakula, our head of depertment, who was continuosly catalysing students of various years to collaborate among themselves to get the best output.

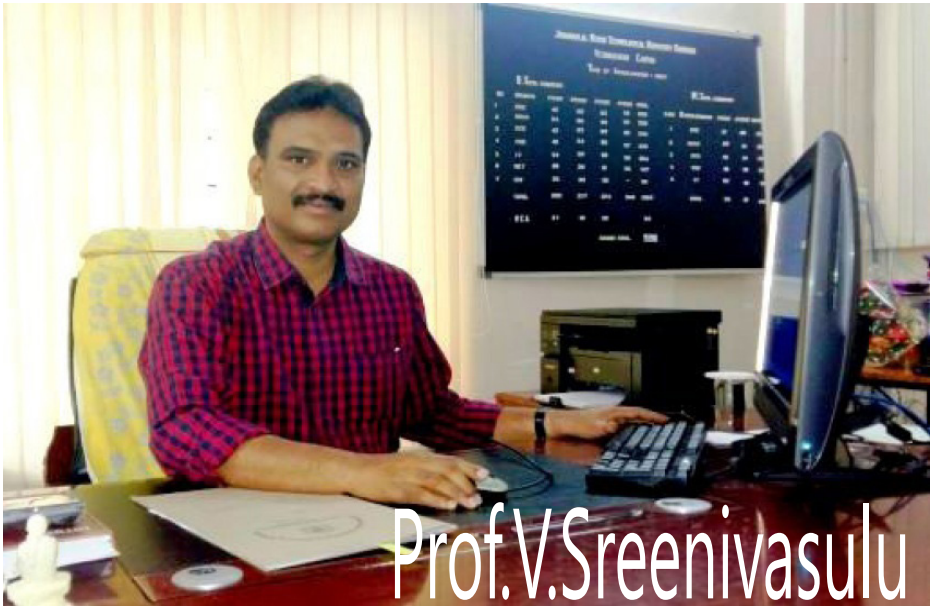
We would like to extend a special thanks to Dr. G. Saraswathi and Mrs. A. Padmaja for their approachability and constant support.This edition is gathering of recent advancements in electrical and electronics like graphene,artificial photosynthesis,amr,why not B battery,myths of mobile radiation. The general topics like brain teasing questions, facts, current affairs and inspiring minds were also included.

Once again, we would like to express our considerable appreciation to all authors of articles and their knowledge in carving "THE MEMOIR-chronicles of EEE".

We welcome your valuable suggestion to improve the standard of our magazine.

THANK YOU
-Magazine team

Principal's Message



I am extremely happy to note that the Department of Electrical and Electronics Engineering student community is bringing out the fourth edition of its news letter "THE MEMOIR".

In this connection, I invite the attention of the students towards the articles read in the magazine which paves the way to the world of innovation and invention. It also leads the students to get exposure about new technologies and improve their personality by knowing the life of the inspiring personalities read in the magazine.

I whole heartedly congratulate the the members of editorial board for their act in keeping their spirit at high. I wish them all success.

HOD's Message

Iam extremely delighted to note that the student community of Department of Electrical and Electronics Engineering,JNTUK UCEV in bringing out fourth edition of its bimonthly news letter "THE MEMOIR'. I wish them all success.

In this connection, I invite the attention of students to- wards the successful and inspiring personalities read in the news paper. I would like to congratulate the effort put by them who contributed the technical and literary articles to the magazine.

I whole heartedly congratulate the members of editorial board for keeping and continuing the spirit at high for bringing the magazine to reality.

CONTENTS

Editor : Y.V.M.Swathi

Design : Luke Daniel & III years

MESSAGE OF MAGAZINE

Maintain our environment clean and green

Keep plants around the house, Plants are amazing at cleaning their environment. Having them in your house can reduce indoor air pollutants by more than half. Great choices are English ivy and peace lilies, which absorb toxic gases like benzene and formaldehyde. Just be sure that if you have pets and/or small children that you opt for plants that are not poisonous.

Reduce the waste when giving gifts. Instead of wrapping paper, choose newspaper (the comics work great when they're in color), reusable gift bags or even leftover wallpaper. When you receive a gift packaged in a reusable material be sure to save it for later. Also save your greeting cards and recycle them into gift tags.

Say no to junk mail. So much paper is wasted on sending junk mail and flyers. Put up a sign on your mailbox refusing these items and send a message to advertisers that you want them to change their marketing techniques. If enough people do this they will eventually listen.

Use cloth instead of paper. Using paper napkins and paper towels generates a lot of unnecessary waste. Did you know that the paper industry is the third greatest contributor to global warming emissions? So instead of paper, opt for cloth. A great source of rags is to use old clothes that are too stained or tattered to be worn anymore.

Use rechargeable batteries. If yours is like most households, you have a lot of things that run on batteries. Everything from the TV remote to your camera. And if you have children you can add a seemingly endless number of toys to the list! Do the environment a favor and use rechargeable batteries. They cost more upfront but they generate significantly less waste and in the end will save you money. Solar powered battery rechargers are even available online.

Dispose of hazardous materials properly. Most municipalities have programs for properly disposing of hazardous materials such as old tires, batteries, electronics, used oil materials and toxic substances such as paint and paint thinners. Be sure to inquire in your area about programs designed to keep these potentially dangerous materials out of the landfills.

Install water saving showerheads and faucet aerators. Heating water accounts for approximately 15% of the average household energy bill. Cut this down by installing water saving showerheads and aerators on kitchen faucets. They use nearly 60% less water and chances are you won't even notice the difference (until you get your electricity bill!)

Reuse paper. A lot of the paper we recycle only has printing on one side. Instead of using a fresh piece every time, print on the other side for documents that are not important. You can also reuse paper as a scratch pad for notes or put them together as a pad and keep them next to the telephone for taking messages.

Turn the tap off. Your mother probably told you to do it when you were a child, but do you? When brushing your teeth or shaving, always be sure to turn the water off. Even a few seconds can waste a tremendous amount of water unnecessarily. It's a simple thing that can have a big impact on the amount of water used in your home.

Look for little ways you can make a difference. Sometimes the best thing we can do for the environment is to make small changes in our every day life. When we add them all up, we can make a significant difference. Look at everything you do in a day and see what you can do differently. For example, if you are a tea drinker only boil as much water as you need in the kettle. If you generate a lot of garbage think of a couple of ways you can cut back.

Gurrala Durga Rao
16VV5A0264

5 Reasons Graphene Will Change Gadgets Forever

The future of technology could hinge on a single material. The industry is currently buzzing over the potential of graphene, which is the strongest, slimmest and most malleable material in known existence. Graphene, which is a form of carbon, could change the way our devices look, feel, perform--and even interact with our bodies. Here's how this sensational substance will influence the world of tech.

Stronger Than Steel

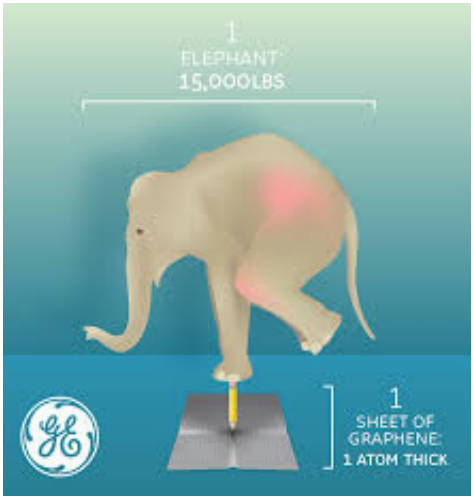
Smartphones like the LG G Flex can heal themselves from minor scrapes and scratches, but graphene should take durability to the next level. The material is purportedly 200 times stronger than steel.

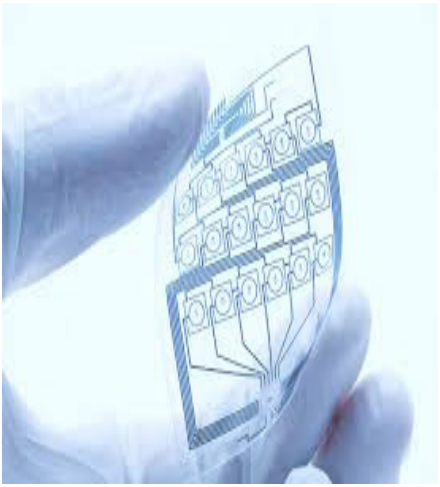
Flexible Like Rubber

Graphene is also resistant to water, so the material could potentially usher in a new generation of waterproof devices whose chassis may not need to be sealed like today's devices.

The Lightest, Thinnest Devices Ever

According to a study from the American Chemical Society, graphene is thin enough to stretch over 28 football fields. The material holds a ton of tech potential, as we could someday see paper-thin smartphones and tablets that you can fold up when not in use. Graphene is also





highly transparent, according to a previous GigaOM report. This could lead to devices that are not only razor-thin, but also sport see-through displays like the one mocked up in this iPhone 6 concept. GigaOM also points out that graphene could allow for smaller electronic transistors, meaning that the slimmest devices could still be impressively powerful.

Incredible Battery Life and Audio

Graphene will likely influence not just how our devices look, but how long they last. Northwestern University researchers built a battery made of graphene and silicon, which supposedly lasted over a week on a single charge and only took 15 minutes to juice up. If graphene goes mainstream, you could possibly leave your smartphone charger home when traveling. This "wonder material" could be used for speakers, and could blow today's mainstream audio accessories out of the water. According to Gizmag, a rough prototype of graphene-based earbuds has a better frequency response curve than a set of Sennheiser MX-400 headphones.

What is graphene?

Graphene is made of a single layer of carbon atoms that are bonded together in a repeating pattern of hexagons. Graphene is one million

times thinner than paper; so thin that it is actually considered two dimensional.

How was it discovered?

Chances are good that you have made graphene many times in your life. Draw a line with a pencil and small bits of graphene will flake off. But no one had both the tools and interest to reliably isolate free-standing graphene until the early 2000s.
G

Why is it unusual?

Intel's transistors at 32 nanometers. More transistors helped pave the way for cheaper computing.

- Transistors: Computer chips rely on billions of transistors to control the flow of electricity in their circuits. Research has mostly focused on making chips more powerful by packing in more transistors, and graphene could certainly give rise to the thinnest transistors yet. But transistors can also be made more powerful by speeding the flow of electrons — the particles that make up electricity. As science approaches the limit for how small transistors can be, graphene could push the limit back by both moving electrons faster and reducing their size to a few atoms or less.
- Transparent screens: Devices such as plasma TVs and phones are commonly coated with a material called indium tin oxide. Manufacturers are actively seeking alternatives that could cut costs and provide better conductivity, flexibility and transparency. Graphene is an emerging option. It is non-reflective and appears very transparent. Its conductivity also qualifies it as a coating to create touchscreen devices. Because graphene is both strong and thin, it can bend without breaking, making it a good match for the bendable electronics that will soon hit the market.

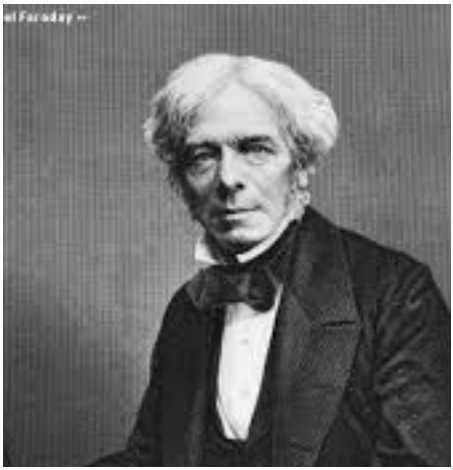
Graphene could also have applications for camera sensors, DNA sequencing, gas sensing, material strengthening, water desalination and beyond.

V.Venu Madhavi
15VV1A0233

ABOUT A SCIENTIST

Michael Faraday

Michael Faraday FRS (22 September 1791 – 25 August 1867) was an English scientist who contributed to the study of electromagnetism and electrochemistry. His main discoveries include the principles underlying electromagnetic induction, diamagnetism and electrolysis.



Although Faraday received little formal education, he was one of the most influential scientists in history. It was by his research on the magnetic field around a conductor carrying a direct current that Faraday established the basis for the concept of the electromagnetic field in physics. Faraday also established that magnetism could affect rays of light and that there was an underlying relationship between the two phenomena. He similarly discovered the principles of electromagnetic induction and diamagnetism, and the laws of electrolysis. His inventions of electromagnetic rotary devices formed the foundation of electric motor technology, and it was largely due to his efforts that electricity became practical for use in technology.

As a chemist, Faraday discovered benzene, investigated the clathrate hydrate of chlorine, invented an early form of the Bunsen burner and the system of oxidation numbers, and popularised terminology such as "anode", "cathode", "electrode" and "ion". Faraday ultimately became the first and foremost Fullerian Professor of Chemistry at the Royal Institution, a lifetime position.

Faraday was an excellent experimentalist who conveyed his ideas in clear and simple language; his mathematical abilities, however, did not extend as far as trigonometry and were limited to the simplest algebra. James Clerk Maxwell took

the work of Faraday and others and summarized it in a set of equations which is accepted as the basis of all modern theories of electromagnetic phenomena." The SI unit of capacitance is named in his honour: the Farad.

Faraday was born in Newington Butts In London. His family was not well off. The young Michael Faraday, who was the third of four children, having only the most basic school education, had to educate himself. At the age of 14 he became an apprentice to George Riebau, a local bookbinder and bookseller in Blandford Street. Faraday subsequently sent Davy a 300-page book based on notes that he had taken during these lectures. Davy's reply was immediate, kind, and favorable. In 1813, when Davy damaged his eyesight in an accident with nitrogen trichloride, he decided to employ Faraday as an assistant. Coincidentally one of the Royal Institution's assistants, John Payne, was sacked and Sir Humphry Davy had been asked to find a replacement; thus he appointed Faraday as Chemical Assistant at the Royal Institution on 1 March 1813. Very soon Davy entrusted Faraday with the preparation of nitrogen trichloride samples, and they both were injured in an explosion of this very sensitive substance.

Davy set out on a long tour of the continent in 1813–15, his valet did not wish to go, so instead, Faraday went as Davy's scientific assistant and was asked to act as Davy's valet until a replacement could be found in Paris. Faraday was forced to fill the role of valet as well as assistant throughout the trip. The trip did, however, gave him access to the scientific elite of Europe and exposed him to a host of stimulating ideas.

In June 1832, the University of Oxford granted Faraday a Doctor of Civil Law degree (honorary). During his lifetime, he was offered a knighthood in recognition for his services to science, which he turned down on religious grounds, and stating that he preferred to remain "plain Mr Faraday to the end". He twice refused to become President of the Royal Society.

Faraday died at his house at Hampton Court on 25 August 1867, aged 75. He had some years before turned down an offer of burial in Westminster Abbey upon his death, but he has a memorial plaque there, near Isaac Newton's

tomb.

Faraday's earliest chemical work was as an assistant to Humphry Davy. Faraday was specifically involved in the study of chlorine; he discovered two new compounds of chlorine and carbon. He also conducted the first rough experiments on the diffusion of gases, a phenomenon that was first pointed out by John Dalton

Faraday invented an early form of what was to become the Bunsen burner, which is in practical use in science laboratories around the world as a convenient source of heat. Faraday worked extensively in the field of chemistry, discovering chemical substances such as benzene. Faraday is also responsible for discovering the laws of electrolysis, and for popularizing terminology such as anode, cathode, electrode, and ion.

Faraday was the first to report what later came to be called metallic nanoparticles. In 1847 he discovered that the optical properties of gold colloids differed from those of the corresponding bulk metal. This was probably the first reported observation of the effects of quantum size, and might be considered to be the birth of nanoscience.

Faraday is best known for his work regarding electricity and magnetism. His first recorded experiment was the construction of a voltaic pile with seven ha'penny coins, stacked together with seven disks of sheet zinc, and six pieces of paper moistened with salt water. With this pile he decomposed sulfate of magnesia .

One of Faraday's 1831 experiments demonstrating induction. The liquid battery (right) sends an electric current through the small coil (A). When it is moved in or out of the large coil (B), its magnetic field induces a momentary voltage in the coil, which is detected by the galvanometer (G).

Faraday's breakthrough came when he wrapped two insulated coils of wire around an iron ring, and found that upon passing a current through one coil a momentary current was induced in the other coil. This phenomenon is now known as mutual induction. The iron ring-coil apparatus is still on display at the Royal Institution. In subsequent experiments, he found that if he moved a magnet through a loop of wire an electric

current flowed in that wire. The current also flowed if the loop was moved over a stationary magnet. His demonstrations established that a changing magnetic field produces an electric field; this relation was modelled mathematically by James Clerk Maxwell as Faraday's law, which subsequently became one of the four Maxwell equations, and which have in turn evolved into the generalization known today as field theory. Faraday would later use the principles he had discovered to construct the electric dynamo, the ancestor of modern power generators and the electric motor.

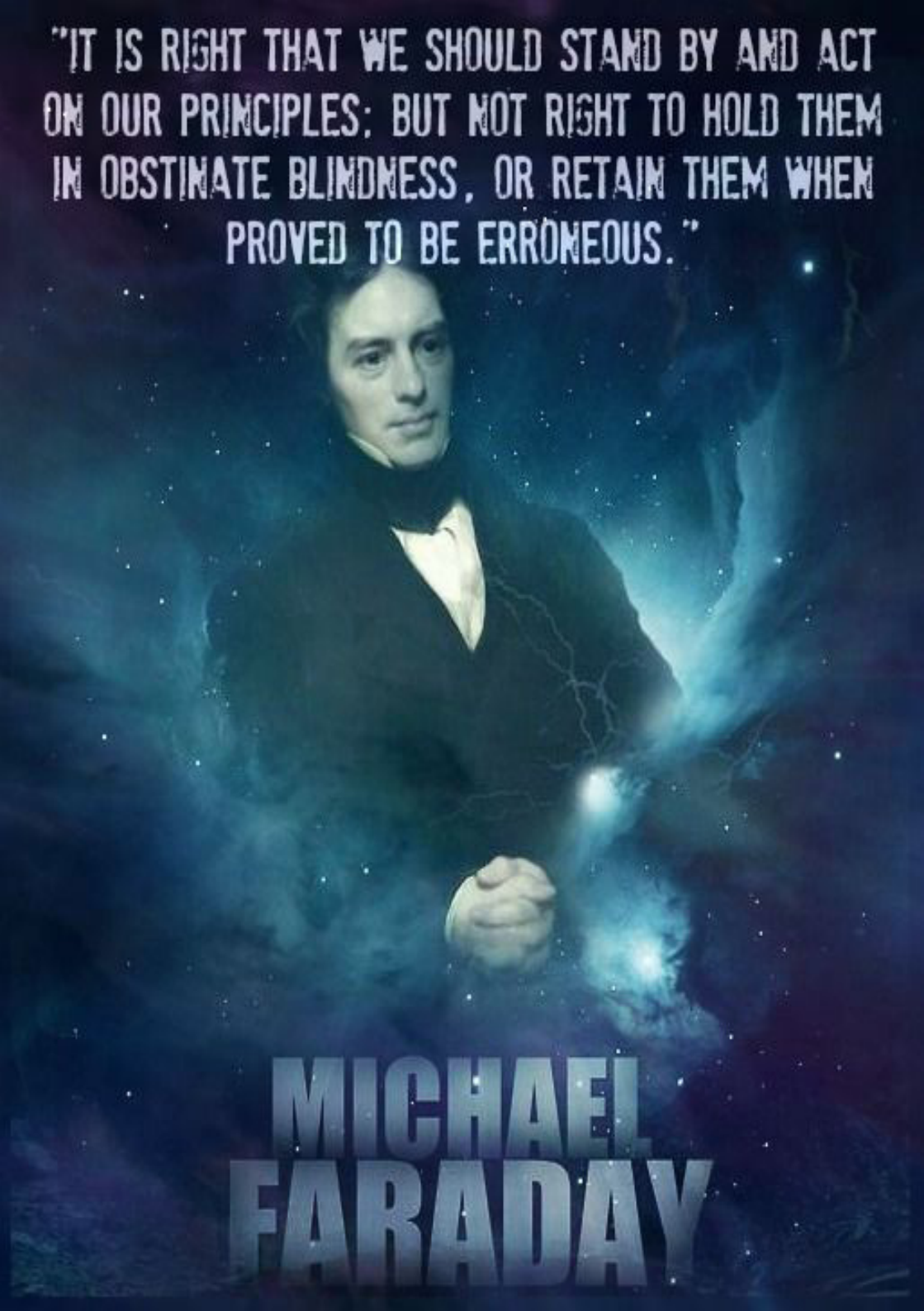
In 1832, he completed a series of experiments aimed at investigating the fundamental nature of electricity; Faraday used "static", batteries, and "animal electricity" to produce the phenomena of electrostatic attraction, electrolysis, magnetism, etc. He concluded that, contrary to the scientific opinion of the time, the divisions between the various "kinds" of electricity were illusory. Faraday instead proposed that only a single "electricity" exists, and the changing values of quantity and intensity (current and voltage) would produce different groups of phenomena.

Near the end of his career, Faraday proposed that electromagnetic forces extended into the empty space around the conductor. This idea was rejected by his fellow scientists, and Faraday did not live to see the eventual acceptance of his proposition by the scientific community. Faraday's concept of lines of flux emanating from charged bodies and magnets provided a way to visualize electric and magnetic fields; that conceptual model was crucial for the successful development of the electromechanical devices that dominated engineering and industry for the remainder of the 19th century.

In his work on static electricity, Faraday's ice pail experiment demonstrated that the charge resided only on the exterior of a charged conductor, and exterior charge had no influence on anything enclosed within a conductor. This is because the exterior charges redistribute such that the interior fields emanating from them cancel one another. This shielding effect is used in what is now known as a Faraday cage.

V.HAREESH
16VV5A0266

"IT IS RIGHT THAT WE SHOULD STAND BY AND ACT ON OUR PRINCIPLES; BUT NOT RIGHT TO HOLD THEM IN OBSTINATE BLINDNESS, OR RETAIN THEM WHEN PROVED TO BE ERRONEOUS."



MICHAEL FARADAY

STUDENT ARTICLES

Using electrical signals to train the heart's muscle cells

Researchers demonstrate that electrical stimulation can regulate and synchronize the beating properties of nascent heart cells

Electrical stimulation of human heart muscle cells engineered from human stem cells aids their development and function, researchers have demonstrated for the first time. They used electrical signals, designed to mimic those in a developing heart, to regulate and synchronize the beating properties of nascent cardiomyocytes, the cells that support the beating function of the heart.

Electrically conditioned human cardiomyocytes. Striated ultrastructure containing troponin (stained in green) forms around cell nuclei (stained in blue.)

Columbia Engineering researchers have shown, for the first time, that electrical stimulation of human heart muscle cells (cardiomyocytes) engineered from human stem cells aids their development and function. The team used electrical signals, designed to mimic those in a developing heart, to regulate and synchronize the beating properties of nascent cardiomyocytes, the cells that support the beating function of the heart. The study, led by Gordana Vunjak-Novakovic, The Mikati Foundation Professor of Biomedical Engineering and a professor of medical sciences (in medicine), is published online January 19 in Nature Communications.

Cardiovascular disease is one of the major health problems around the world, especially because the heart cannot repair itself: if cardiomyocytes are lost to injury or disease, they have only a minimal ability to regenerate. Scientists have been trying to develop ways to regenerate hearts by using cardiomyocytes grown from the patient's cells taken from skin or blood.

To be successful, these cardiomyocytes need to respond to and integrate with the surrounding heart muscle. But, currently, the immaturity and resultant irregular beating of human cardiomyocytes derived from stem cells have limited their usefulness for regenerative medicine and biological research.

"We've made an exciting discovery," says Vunjak-Novakovic. "We applied electrical stimulation to mature these cells, regulate their

contractile function, and improve their ability to connect with each other. In fact, we trained the cell to adopt the beating pattern of the heart, improved the organization of important cardiac proteins, and helped the cells to become more adult-like. This preconditioning is an important step to generating robust cells that are useful for a wide range of applications including the study of cardiomyocyte biology, drug testing, and stem cell therapy. And we think that our method could lead to the reduction of arrhythmia during cell-based heart regeneration."

The team grew human stem cell-derived cardiomyocytes and engineered them into three-dimensional structures. They then exposed these structures to electrical signals that mimicked those in a healthy heart--over just one week. They showed that this electrical stimulation increased cardiomyocyte connectivity and the regularity of muscle contraction.

The researchers plan to conduct fundamental studies of how the immature heart develops its beating function, and to investigate whether the "conditioned" cardiomyocytes will have the ability to seamlessly integrate with the heart

muscle and provide a synchronized beating function.

"The heart is an organ of amazing complexity with about 3 billion cells that beat synchronously in response to electrical signals," Vunjak-Novakovic observes. "Our ability to recapitulate biology using bioengineering tools continues to drive our work and to be a source of inspiration. We are frequently reminded that this may be the best time ever to pursue biomedical engineering research!"

Story Source:

Materials provided by Columbia University School of Engineering and Applied Science. Note: Content may be edited for style and length.

Ch.Pavani Geetha
15VV1A0203
CH.Harshavardhini
15VV1A0205

Myths about mobile radiation

It is generally said to use mobile phones less often, as it gives off radiation which is harmful to the human body; Thereby causing a variety of problems ranging from headaches to heart problems to infertility even linked to cancer. Apparent as it may seem these conceptions that are held, hold up less when faced with actual facts.

Actually the word "Radiation" is a misnomer, often referred to as something bad. But it actually refers to the energy emissions in form of Electromagnetic waves, which in fact each and every body in the universe does. The breed that radiation is often conceived as is called ionizing radiation i.e. the radiation has enough potential to knock off electrons out of an atom thus forming ions. On contrary there is Non-ionizing radiation which unsurprisingly don't form ions.

Before even getting into heat of the topic,i ts is important to know how EM waves work. According to Planck's law, the energy of the EM wave is proportional to its frequency i.e, the more frequency the wave has the more is it energized. Einstein's explanation of photoelectric effect, the EM wave can only ionize an atom if it holds up more energy than the threshold which is the length of transition of the electron to escape which is in order of a few nanometers. The mobile phones emit a radiation in range of microwaves and radio waves. Its known that the wavelength of these waves are in order of a few millimeters to a few kilometers. As no known atom is in that order, thus these waves are Non-ionizing. But, however depending upon the intensity these can heat up an atom to some degree

thus owing the principle of microwave oven.

As explained earlier the mobile phone radiation is not able to give a nasty affects on human body because of radiation. The intensity too is too tiny that 20 times the normal exposure start a heating effect which is miniscule in nature. There were a few correlations of cell phone radiation with glioma, a tumor in the brain but recent studies don't support this because where cell phones utilization is growing at an exponential rate there is not growth in glioma cases. Even world health organization has classified cellphone radiation under class 2B which signifies no satisfactory results to support the case and further studies required.

Therefore under all this evidence the illeffects of mobile phones are not legit to be afraid of.

http://www.cancer.org/cancer/cancercauses/othercarcinogens/athome/cellular-phones

Syed Nasar Jilani
15VV1A0219

AMR (Automatic Meter Reading)

AMR (Automatic Meter Reading) is the modern Power measuring device .it is being used in measuring electricity , gas , water consumption in many countries on the world since it has a lot of advantages that the old analog meters doesn't have .

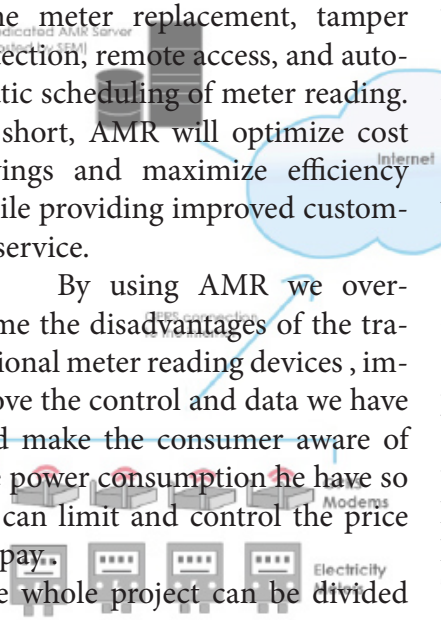
In 1886 , the first ac transmission line was installed . Since this age , it was very important to measure the energy that consumers pay for . Hence , the first generation of power meters was found which we know as (Watt-Hour meter). It has advantages as well as disadvantages like Highly Person dependant.Human errors cannot be avoided.Accessibility of meters in rural/ Agricultural zones.To overcome this disadvantages we have to modify a new reading system that provides remote reading , safety , on-time readings and a simple user interface . That is what AMR provides successfully.

AMR brings significant benefits to the customer by providing increased meter-reading accuracy, fewer estimated bills, rapid re-

sponse to read requests, automatic leak detection and billing options and provides detailed usage information about individual sites, which allows the company to offer variable rates and encourage price -responsive behavior among customers.

AMR improves operational management by providing just-in-time meter replacement, tamper detection, remote access, and automatic scheduling of meter reading. In short, AMR will optimize cost savings and maximize efficiency while providing improved customer service.

By using AMR we overcome the disadvantages of the traditional meter reading devices , improve the control and data we have and make the consumer aware of the power consumption he have so he can limit and control the price he pay..



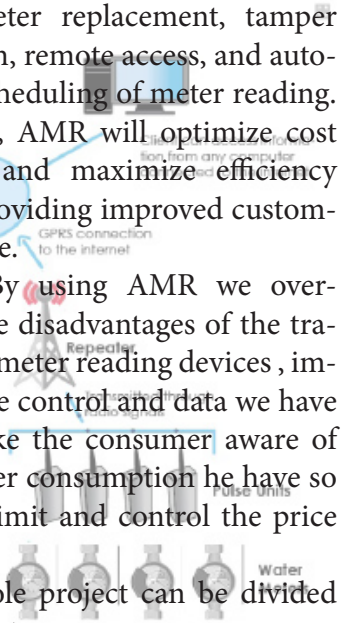
The whole project can be divided into 4 systems

1) Load Management System One of the main aims of the project is the effective management of the loads at the consumer side. A microcontroller is provided at each consumer side which controls the load. In this system the peak time is decided by total load connected to the utility and is not fixed. Hence

sponse to read requests, automatic leak detection and billing options and provides detailed usage information about individual sites, which allows the company to offer variable rates and encourage price -responsive behavior among customers.

AMR improves operational management by providing just-in-time meter replacement, tamper detection, remote access, and automatic scheduling of meter reading. In short, AMR will optimize cost savings and maximize efficiency while providing improved customer service.

By using AMR we overcome the disadvantages of the traditional meter reading devices , improve the control and data we have and make the consumer aware of the power consumption he have so he can limit and control the price he pay .



The whole project can be divided into 4 systems

1) Load Management System One of the main aims of the project is the effective management of the loads at the consumer side. A microcontroller is provided at each consumer side which controls the load. In this system the peak time is decided by total load connected to the utility and is not fixed. Hence

sponse to read requests, automatic leak detection and billing options and provides detailed usage information about individual sites, which allows the company to offer variable rates and encourage price -responsive behavior among customers.

AMR improves operational management by providing just-in-time meter replacement, tamper detection, remote access, and automatic scheduling of meter reading. In short, AMR will optimize cost savings and maximize efficiency while providing improved customer service.

By using AMR we overcome the disadvantages of the traditional meter reading devices , improve the control and data we have and make the consumer aware of the power consumption he have so he can limit and control the price he pay .

This system is kept in synchronizing with the utility. Each and every consumer is provided with a unique address which is stored in the microcontroller as well as the utility data bank. When the meter reading of a particular consumer is to be done, the utility sends the required address through the power line. The required consumer microcontroller is uniquely identified and the microcontroller is instructed to read meter.

Gongada Devendra Sri Surya Teja
15VV1A0229

The first electric toothbrush

The first electric toothbrush, the Broxodent, was invented in Switzerland in 1954 by Dr. Philippe Guy Woog.

DEFINITION: An electric toothbrush is a toothbrush that makes rapid, automatic bristle motions, either back-and-forth oscillation or rotation-oscillation (where the brush head alternates clockwise and counter clockwise rotation), in order to clean teeth. Motions at sonic speeds or below are made by a motor. In the case of ultrasonic toothbrushes, ultrasonic motions are produced by a piezoelectric crystal. A modern electric toothbrush is usually powered by a rechargeable battery charged through inductive charging when the brush sits in the charging base between uses.

Electric toothbrushes can be classified according to the fre-

quency (speed) of their movements as power, sonic or ultrasonic toothbrushes, depending on whether they make movements that are below, in or above the audible range (20–20,000 Hz or 2400–2,400,000 movements per minute), respectively.

TYPES:SONIC TOOTHBRUSH: Sonic toothbrushes are a subset of electric toothbrushes with movement that is fast enough to produce vibration in the audible range and they typically have frequencies that range from 200 to 400 Hz that is 12,000–24,000 oscillations or 24,000–48,000 movements per minute for achieving this speeds we use high speed dc motors.

ULTRASONIC TOOTHBRUSH: In order for a toothbrush to be considered "ultrasonic" it has to emit a wave(vibration) at a minimum frequency of 20,000 Hz or 2,400,000 movements per minute.

POWER SOURCE AND CHARGING:

Modern electric toothbrushes run on low voltage, 12v or less. A few units use a step-down transformer to power the brush, but most use a battery, usually but not always rechargeable and non-replaceable, fitted inside the handle, which is hermetically sealed to prevent water damage. Modern toothbrushes use contactless inductive charging: the brush unit and charger stand each contain a coil of wire; when placed in proximity, the powered coil from the stand transfers power by induction to the handle, charging the battery.

OPTIONAL FEATURES:

TIMER: Many modern electric toothbrushes have a timer which buzzes, or briefly interrupts power, typically after two minutes, and sometimes every 30 seconds. This is associated with a customary recommendation to brush for two minutes, 30 seconds for each of the four quadrants of the mouth.

DISPLAY: Some electric toothbrushes have LCD screens which show brushing time and sometimes

In order for a toothbrush to be considered "ultrasonic" it has to emit a wave(vibration) at a minimum frequency of 20,000 Hz or 2,400,000 movements per minute.

POWER SOURCE AND CHARGING:

Modern electric toothbrushes run on low voltage, 12v or less. A few units use a step-down transformer to power the brush, but most use a battery, usually but not always rechargeable and non-replaceable, fitted inside the handle, which is hermetically sealed to prevent water damage. Modern toothbrushes use contactless inductive charging: the brush unit and charger stand each contain a coil of wire; when placed in proximity, the powered coil from the stand transfers power by induction to the handle, charging the battery.

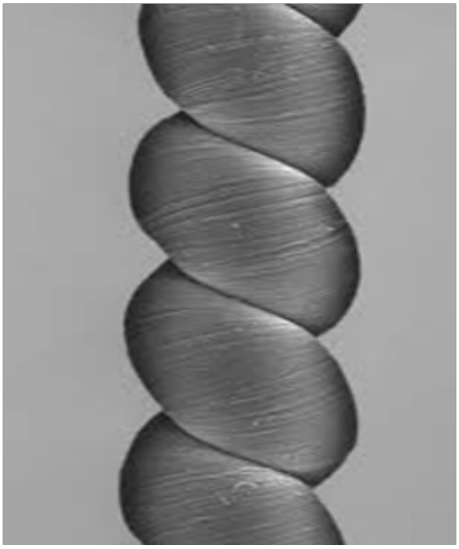
Vadisela David Deenanand Raja
15VV1A0212

ELECTRICITY GENERATED FROM CARBON NANOTUBE YARNS

An international research team led by scientists at The University of Texas at Dallas and Hanyang University in South Korea has developed high-tech yarns that generate electricity when they are stretched or twisted.

CARBON NANOTUBE (CNT) YARNS:

Carbon nanotube yarns are light weight, strong and electrically conductive fiber like materials that exhibit a piezoimpedance response. The yarns are constructed from carbon nanotubes, which are hollow cylinders of carbon 10,000 times smaller in diameter than a human hair. The carbon nanotubes are twisted into high strength,



light weight yarns coiled like an over-twisted rubber band.

HOW CNT YARNS GENERATE ELECTRICITY:

In order to generate elec-

tricity, the yarns must be either submerged in or coated with an ionically conducting material, or electrolyte, which can be as simple as a mixture of ordinary table salt and water. When we insert a carbon nanotube yarn into an electrolyte bath, the yarns are charged by the electrolyte itself. No external battery or voltage is needed.

When a carbon nanotube yarn is twisted or stretched, the volume of the carbon nanotube yarn decreases, bringing the electric charges on the yarn closer together and increasing the energy. This increases the voltage associated with the charge stored in the yarn, enabling the harvesting of electricity.

Stretching the CNT yarns 30 times a second it generates 250 watts per kilogram of peak electrical power when normalized to the harvester's weight, said Dr.Ray Baughman, director of Nano Tech Institute and a corresponding author of study.

LAB TESTS SHOWING POTENTIAL APPLICATIONS:

The researchers found that a twistron yarn weighing less than a housefly could power a small LED, which lit up each time the yarn was stretched.

When twistron yarn is connected to a polymer artificial muscle that contracts and expands when heated and cooled. This mechanical energy generated by the polymer muscle is converted in to electrical energy by carbon nanotube yarns.

The researchers also sewed CNT yarns in to a shirt. Normal breathing stretched the yarn and generated an electric signal, demonstrating its potential as a self-powered respiration sensor.

ELECTRICITY FROM OCEAN WAVES BY USING CNT YARNS:

When a yarn is connected between a balloon and a sinker that rested on the sea bed, whenever an ocean wave arrives the balloon would rise stretching the yarn, there by generating electricity. The ocean waves can both stretch the nanotubes and acts as an electrolyte.

If carbon nanotube yarn making is made less expensive, this ultimately leads to harvesting enormous amount of energy available from ocean waves.

E.KAVYA SRI
15VV1A0244
III EEE

COSMO CONNECTED BRAKE LIGHT

The biggest danger facing a motorcyclist while riding in traffic is getting rear-ended by a car. To address this, cosmo connected has debuted at CES 2017 a solution to help keep two wheeled commuters a little safer on the road.

"Our goal with cosmo connected is to create new safety standard for motorcyclists,"said Romain afflelou, president of Cosmo connected.

COSMO INTRODUCTION:

The Cosmo is an extra visible brake light made of 12 LED'S that attaches to the back of any existing motor cycle helmet via a magnet. The housing is made of poly carbonate and EPDM rubber, is weather resistant and weighs 150 grams.

Powered by a lithium polymer battery that's good for 450 mins of operation on a single charge, the brake light can be programmed to act either as a normal brake light-illuminating on deceleration when sensed by the built-in accelerometer- or it can be set via an app to blink a constant pattern, which might be preferred in less visible conditions or by cyclists looking to borrow this technology.

SMART HELMET ACCESSORY:

Cosmo connected is a detachable smart helmet accessory that combines a rear brake light and a mobile application. For the first time, an app grants motor cycles the same emergency road side assistance as the emergency call does for cars.

FUNCTIONALITY:

- A Brake light at eye-level of the driver in the vehicle behind.
- Constant or flashing red

light (warning mode).

- Rescue-call is sent to the nearest emergency response team within 3 minutes with GPS coordinates and medical information.

WORKING:

There's no on button as a user simply gives the housing a solid tap on one side and the LEDs light up twice when ON.

It turns off after two minutes of inactivity.

Cosmo's sensors determine when your slowing down because the brake light comes on during any deceleration it gives following drivers a much more accurate sense of your change in speed.

We found that Cosmo was bright enough to be seen clearly even during the day, though we did not get a chance to see it in full, direct sunlight.

There's an app for that:

The app turns the device into a fall sensor, with the ability to set three levels of response based on the severity of the fall. We didn't get a chance to try this feature out as it's still under development, though it does sound promising. In theory, we could arrange for emergency responders to come to the last known GPS location.

Cosmo is connected to mobile via Bluetooth.The app in mobile also shows us remaining battery life and lets us control how the LEDs on the brake light behave. We can choose to have them only while braking, activated all the time for extra visibility, or set them to flashing for emergency signaling.

ADVANTAGES:

- its weather proof
- Easy to operate.
- Highly visible when braking.
- It can quickly swap between helmets if we buy additional magnet mounts.

DISADVANTAGES:

- It's hard to find fault with the Cosmo's design.
- It simply won't work for all riders. The curved shape and rubber gasket area designed to work with helmets that have a smooth, continuous radius on the rear surface; not every helmet does.

K.Divya Kamali
15VV1A0222

Why are batteries so sensitive to harsh weather?

It's because inside each battery is a tiny chemical reaction, and chemical reactions are very dependent on temperature.Nearly every battery, from the ones inside your flashlight to the one that starts your car, is made up of three basic parts: two electrodes, an electrolyte, and a separator. The two electrodes are designed for each end of the battery: the cathode connects to the positive end, the anode to the negative. The electrolyte that sits between them is usually a liquid-like substance that contains electrically charged particles called ions. The separator does just that: it separates the cathode from the anode, keeping them from coming into contact and short-circuiting.

When you put batteries in a flashlight, you're completing a circuit. That is, you're making it so the chemical energy in the electrolyte can convert to electrical energy, travel out of the cathode and into the lightbulb, and return in a closed loop into the anode. That conversion into electrical energy happens via a chemical reaction that takes place between the atoms in the

electrodes and the ions in the electrolyte.

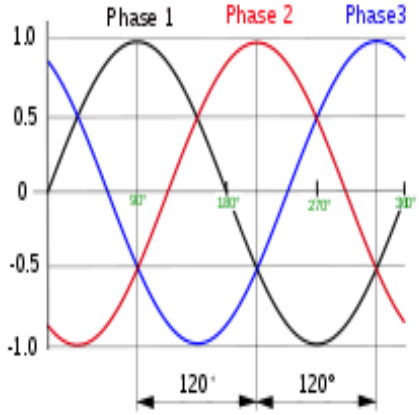
There's a particular rule in chemistry called the Arrhenius equation, which says that the higher the temperature, the faster a chemical reaction will take place. So when you take your phone out into the blazing heat of a summer hike, the chemical reactions inside the battery go on overdrive. The result? If you're taking a digital camera out to shoot pictures of the new snow, you might find that your battery life is strangely short. That's because the sluggish chemical reaction makes the batteries produce less and less current until

they can't keep up with the camera's demand. Luckily, once the batteries are warm again, they'll power devices just fine. That slow discharge rate in the cold is also the reason some people store batteries in the fridge or freezer, incidentally, although that's not strictly necessary. You just need to keep batteries in a dry place at normal room temperature to ensure they live a long, strong life.

G.M.V. Sai Krishna
15VV1A0220

WHY 3 PHASE POWER? WHY NOT 6 OR 12?

Why people choose 3 phases when they transmit power why not 4 and one up 5 right not twelve. And I realized that if we took a 30 transmission line and then you rotated this one sixty degrees electrically you could put it inside of the first one and your circle isn't getting any bigger but now you have it would seen twice the amount of power you could I fact have almost twice the amount of power now you have a 6 phases line instead of a 3phases line but the voltage per foot between phases is same because you reduced the voltage between phases by changing rotating the electric angle if that works for six why can't you put another 6 phase line inside of a 6phase line rotated a little more now I have 12 phases if that works why can't you do it again and again and again until you have a tube that is a conductor longitudinally a funny material but it's an insulator circumferentially it's an anisotropic tube and if you want a intresting adventure in mathematics figure out the characteristics of that tube it's double but a more practical vane during PTI we propose some serious we will look at the phase and 12 phase line it turns out that



the gain in power is not proportionate out that the green in power is not. Proportionate six phase almost doubles 3 phases 12 phase does not almost double 6 phase so it's a diminishing return we actually built a tower PTI had a test site in Malta and we actually have it of how a 6phase tower might look with and we can also have tower with centre conductor. By testing exactly as you would predict it is so the math proved. When a 3phase goes into substation has 3 circuit breakers to open it and lose it and throughout that substation there are 3 busbars that are connect to with a six phase line there would be six circuit breakers and twelve bus bars so the complexity a high phase order line of coupling that it a substation sorts defeats economics of it although periodically people raise the question because it would be possible for example is very easy to couple from 12 phase through a transformer down the 3phases but it remains an intriguing concept probably more useful for power educators than for transmission line companies.

Nandikanti Mohan Venkat
16VV5A0262

BLADELESS WINDMILL POWER GENERATION

The turbines we currently use for wind power are incredibly advanced pieces of technology. Everything inside of them –from the shape of their airfoils to the generators they spin-has been painstakingly engineered for maximum efficiency.

These incredible tube- like wind turbines from Spanish start-up Vortex Bladeless. Through a clever manipulation of physics, the company's turbines are able to generate electricity without the help of any large, spinning blades.

It sounds crazy, but it's totally legit-Vortex has been developing the turbines for the past few years, and

even went so far as to build its own wind tunnel to prove the technology works.

Instead of capturing energy through the circular motion of a propeller, Vortex turbines take advantage of a physical phenomenon known as VORTICITY- an aerodynamic effect that creates a pattern of spinning vortices or whirlwinds. Think about the little eddies that form around the edge of a canoe paddle when you move it through the water. This is the same principle-except substituting air instead of water, of course, and with the air moving around a stationary paddle (the turbine) that sticks out of the ground.

As the wind blows past to the turbine, little whirlwinds are created behind it, and when they get big enough, they cause the structure to oscillate. This kinetic energy is then used to power an alternator, which multiplies the frequency of the tower's oscillations and converts the motion in to usable electricity.

Advantages:

1.It reduces manufacturing costs by 53%.

2.Its maintenance costs by 80%.

3.It is much lower risk to birds that fly near them.

R. S. Kiranmayee
15VV1A0209
R. Kusuma Kumari
15VV1A0216

HISTORY OF ELECTICAL MOTORS

The day to day life of every citizen of this planet depends up on the electrical appliances . The most important one among them are electrical motors these have many applications in our every day life from small toys to transportation of heavy goods ,from hair driers to vaccum cleaners ,from irrigation to harvesting of crops. But these motors that we are using now are not created or constructed immediatly these evolved for many years surpassing every problem and now they play an important role in our life .now let us see the brief history of electrical motors.

Adrew garden the first person who demonistrated the first DC motor based on the principle of interaction of electrical current and magnetic field later in1820 it is discovered by adre` marie ampere and named it as ampere's force law. IN 1821 Michael faraday father of electrical engineering demonstrated the effect of magnetic field on current carrying conductor by dipping a wire in mercury on which a

permanent magnet is place when current is passed through the wire it rotates Barlow's wheel is the first reinforcement for it .But these are homo polar and do not rotate fully these to and fro motion of the motor is over came by introducing commutator by Aney Jedlik .In 1828 he demonstrated his dynamo with three components namely Rotor,Stator,Commutator in these he firs used electromagnets in the motor .But these are of lesser output power and of no practical purpose.

This output problem was overcame by Moritz Von Jacobi he counstructed a motor with remarkable output power in 1834 and in later 4 years he upgraded it with output power that a motor can run a boat of 14 peoples across a long river.

Though the output power is of practical purpose the efficiency of dc motor is serious drawback for the motor .The turning point for this came in the year 1864 by demonstration of ring armature with symmetrical group of coils closed up on themselves connected to comutator bars and brushes supplying non fluctuated current. In 1866 Frank Julian spraque invented first practical DC motor of non sparking and maintaining constant speed for variable loads . in1873 Gramme successfully invented real rotating dc motor and demonstrated by connecting two 2KM away from each other and using one as generator. Later so many advancement have occurred breaking the barrages like speed, maximum torque etc .But it took significant time to know that the air gap between the rotor and stator plays a crucial role in efficiency of the motor

FIRST PRACTICAL USAGES

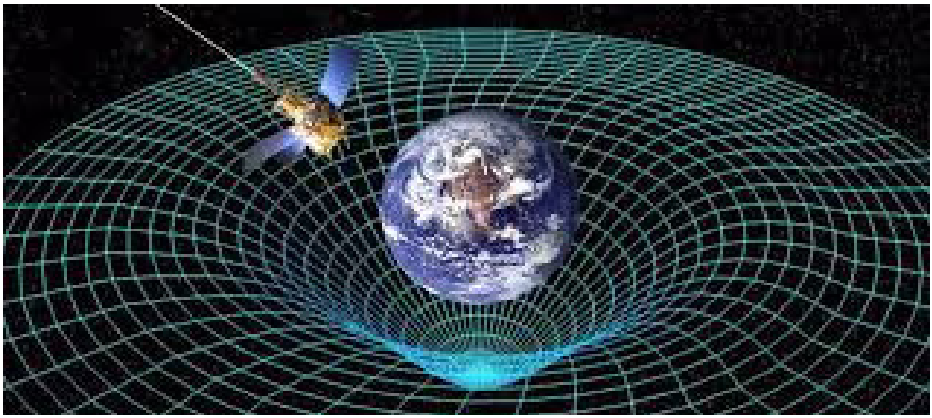
In 1887-88 : Electric trolly system

In 1892 :Electric elevator and control system

Electric subway with independently power centrally controlled cars .

Gunda Bhargav Naidu
15VV1A0207

GRAVITATIONAL WAVES USING TO COMMUNICATE WITH THE OTHER WORLD



The universe is not an empty space it is filled with space time fabric. SPF is a sheet like structure and it can stretch and vibrate. Any disturbances on this sheet will cause to produce the ripples called as Gravitational Waves. But the appearance of gravitatioal waves the collisions are very huge black, then the collisionas of the two black holes creates the ripples on the space time fabric and these ripples can travel with the speed of light. So, now we ca create the gravitational waves with over existing technology. We can communicate all over the world. But we need more and more energey to create the gravitational energy . with the help of this gravitational we can transfer the messages the gravitational waves can travel the millions of ight years way. Sp we can transfer the messages the million of light year away from us.

WHY WE NEED ONLY GRAVITATIONAL WAVES TO COMMUNICATE WITH OTHER WORLD ?

…because it can travel with the speed of light and also it can travels billions of light years away from us.

ADVANTAGES:

1.We can communicate with other world.

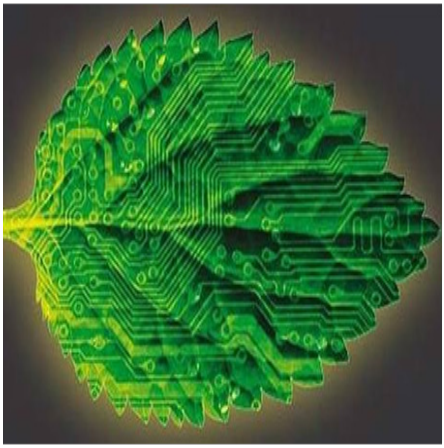
2.The relationaship will increase with each other.

DISADVANTAGES

1. The creation of gravitational waves id very difficult.
2. We need very huge amount of energy to create black holes.

Dandusena Krishna Kumar
15VV1A0228

Artificial photosynthesis



"Bill Gates has said that to solve our energy problems, someday we need to do what photosynthesis does, and that someday we might be able to do it even more efficiently than plants,"says Nocera. "That someday has arrived."

INTRODUCTION:

In Nature,plants use sunlight to make carbohydrates from carbon dioxide and water.Artificial photosynthesis seeks to use the same inputs-solar energy,water and carbon dioxide-to produce energy-dense liquid fuels.Nocera and silver's system uses a pair of catalysts to split water into oxygen and hydrogen,and feeds the hydrogen to bacteria along with carbon dioxide.The bacteria,a microorganism that has been bioengineered to specific characteristics,converts the carbon dioxide and hydrogen into liquid fuels.

CURRENT RESEARCH:

In energy terms, natural photosynthesis can be divided in three steps:

- Light-harvesting complexes in bacteria and plants capture photons and transducer them into electrons,injecting them into the photosynthetic chain.
- Proton-coupled electron transfer along several cofactors of the photosynthetic chain, causing local, spatial charge separation.
- Redox catalysts, which uses the aforementioned transferred electrons to oxidize water to dioxygen and protons; these protons can in some species be utilized for di-hydrogen production.
- The photo sensitizer transfers electrons to the hydrogen catalyst when hit by light, becoming oxidized in the process. This drives the water splitting catalyst to donate electrons to the photo sensi-

tizer.

HYDROGEN CATALYST:

Hydrogen is the simplest solar fuel to synthesize, since it involves only the transference of two electrons to two protons.

$$2e^- + 2H^+ \rightarrow H + H^- \rightarrow H_2$$

WATER-OXIDISING CATALYSTS:

Water oxidation is a more complex chemical reaction than proton reduction. Electrons are delivered to water molecules, with the resulting production of molecular oxygen and protons.

$$2H_2O \rightarrow O_2 + 4H^+ + 4e^-$$

WORKING:

This system consists of three main components: two electrodes-one photo anode and one photocathode-and a membrane. The photo anode uses sunlight to oxidize water molecules, generating protons and electrons as well as oxygen gas. The photocathode recombines the protons and electrons to form hydrogen gas.

A key part of the JCAP design is the plastic membrane, which keeps the oxygen and hydrogen gases separate. If the two gases are allowed to mix and are accidently ignited, an explosion can occur; the membrane lets the hydrogen fuel be separately collected under pressure and safely pushed into a pipeline.

Semiconductors such as silicon or gallium arsenide absorb light efficiently and are therefore used in solar panels. However, these materials also oxidize on the surface when exposed to water, so cannot be used to directly generate fuel.

Advantages:

•The solar energy can be immediately converted and stored. In photovoltaic cells, sunlight is converted into electricity and then converted again into chemical energy for storage, with some necessary loss of energy associated with the second conversion.

Disadvantages:

•Materials used for artificial photosynthesis often corrode in water, so they may be less stable than photovoltaics over long periods of time.

•The cost is not advantageous enough to compete with fossil fuels as a commercially viable source of energy.

Y.V.M.Swathi
15VV1A0236

Wireless Power Transmission

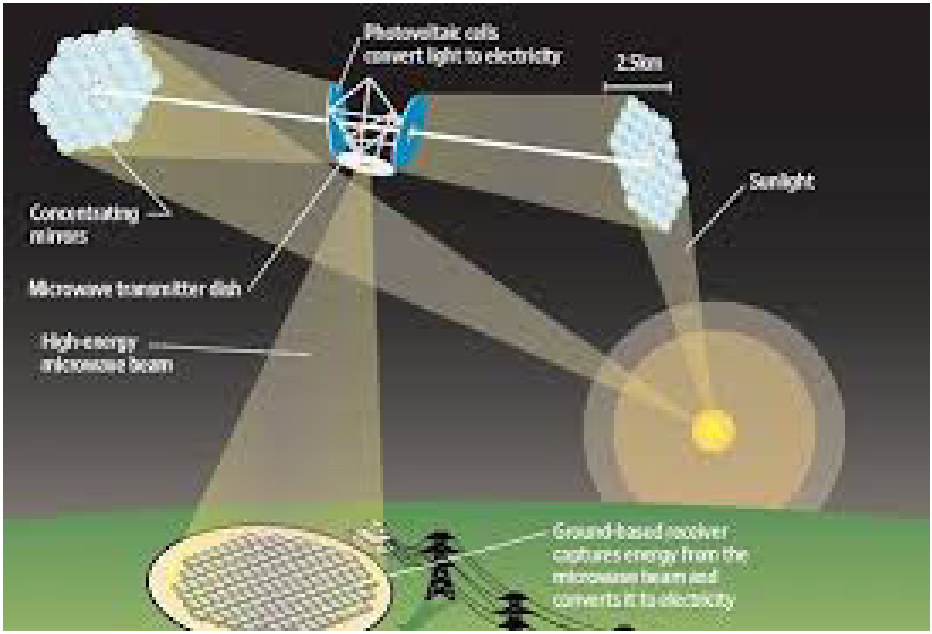
It is known that electromagnetic energy also associated with the propagation of the electromagnetic waves. We can use theoretically all electromagnetic waves for a wireless power transmission (WPT).

The difference between the WPT and communication systems is only efficiency. The Maxwell's Equations indicate that the electromagnetic field and its power diffuse to all directions. Although we transmit the energy in the communication system, the transmitted energy is diffused to all directions. Although the received power is enough for a transmission of information, the efficiency from the transmitter to receiver is quiet low. Therefore, we do not call it the WPT system. T

ypical WPT is a point-to-point power transmission. For the WPT, we had better concentrate power to receiver. It was proved that the power transmission efficiency can approach close to 100%. We can more concentrate the transmitted microwave power to the receiver aperture areas with taper method of the transmitting antenna power distribution. Famous power tapers of the transmitting antenna are Gaussian taper, Taylor distribution, and Chebychev distribution. These taper of the transmitting antenna is commonly used for suppression of sidelobes. It corresponds to increase the power transmission efficiency. Concerning the power transmission efficiency of the WPT, there are some good optical approaches in Russia. Future suitable and largest application of the WPT via microwave is a Space Solar Power Satellite (SPS).

The SPS is a gigantic satellite designed as an electric power plant orbiting in the Geostationary Earth Orbit (GEO). It consists of mainly three segments; solar energy collector to convert the solar energy into DC (direct current) electricity, DC-to-microwave converter, and large antenna array to beam down the microwave power to the ground. The first solar collector can be either photovoltaic cells or solar thermal turbine. The second DC-to-microwave converter of the SPS can be either microwave tube .

It is known that electromagnetic energy also associated with the propagation of the electromagnetic waves.



It is known that electromagnetic energy also associated with the propagation of the electromagnetic waves. We can use theoretically all electromagnetic waves for a wireless power transmission (WPT).

The difference between the WPT and communication systems is only efficiency. The Maxwell's Equations indicate that the electromagnetic field and its power diffuse to all directions. Although we transmit the energy in the communication system, the transmitted energy is diffused to all directions. Although the received power is enough for a transmission of information, the efficiency from the transmitter to receiver is quiet low. Therefore, we do not call it the WPT system. Typical WPT is a point-to-point power transmission. For the WPT, we had better concentrate power to receiver. It was proved that the power transmission efficiency can approach close to 100%. We can more concentrate the transmitted microwave power to the receiver aperture areas with taper method of the transmitting antenna power distribution. Famous power tapers of the transmitting antenna are Gaussian taper, Taylor distribution, and Chebychev distribution.

Luke Daniel
16VV5A0265

Van de Graaff generator

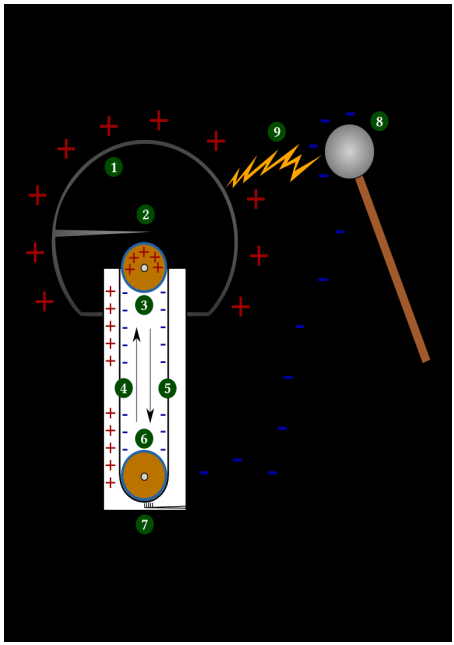
A Van de Graaff generator is an electrostatic generator which uses a moving belt to accumulate electric charge on a hollow metal globe on the top of an insulated column, creating very high electric potentials. It produces very high voltage direct current (DC) electricity at low current levels. It was invented by American physicist Robert J. Van de Graaff during 1929.[1] The potential difference achieved by modern Van de Graaff generators can be as much as 5 megavolts. A tabletop version can produce on the order of 100,000 volts and can store enough energy to produce a visible spark. Small Van de Graaff machines are produced for entertainment, and for physics education to teach electrostatics; larger ones are displayed in some science museums.

The Van de Graaff generator was developed as a particle accelerator for physics research, its high potential is used to accelerate subatomic particles to great speeds in an evacuated tube. It was the most powerful type of accelerator of the 1930s until the cyclotron was developed. Van de Graaff generators are still used as accelerators to generate energetic particle and x-ray beams for nuclear medicine research. In order to double the voltage, two generators are often used together, one generating positive and the other negative potential; this is termed a tandem Van de Graaff accelerator. For example, the Brookhaven National Laboratory Tandem Van de Graaff achieves about 30 million volts of potential difference.

The voltage produced by an open-air Van de Graaff machine is limited by a A simple Van de Graaff generator consists of a belt of rubber (or a similar flexible dielectric material) moving over two rollers of differing material, one of which is surrounded by a hollow metal sphere.[2] Two electrodes, (2) and (7), in the form of comb-shaped

rows of sharp metal points, are positioned near the bottom of the lower roller and inside the sphere, over the upper roller. Comb (2) is connected to the sphere, and comb (7) to ground. The method of charging is based on the triboelectric effect, such that simple contact of dissimilar materials causes the transfer of some electrons from one material to the other. For example (see the diagram), the rubber of the belt will become negatively charged while the acrylic glass of the upper roller will become positively charged.

The belt carries away negative charge on its inner surface while the upper roller accumulates positive charge. Next, the strong electric field surrounding the positive upper roller (3) induces a very high electric field near the points of the nearby comb (2). At the points, the field becomes strong enough to ionize air molecules, and the electrons are attracted to the outside of the belt while positive ions go to the comb. At the comb (2) they are neutralized by electrons that were on the comb, thus leaving the comb and the attached outer shell (1) with fewer net electrons. By the principle illustrated in the Faraday ice pail experiment, i.e. by Gauss's law, the excess positive charge is accumulated on the outer surface of the outer shell (1), leaving no field inside the shell. Electrostatic induction by this method continues, building up very large amounts of charge on the shell. rcing and corona discharge to about 5 megavolts. Most modern industrial machines are enclosed in a pressurized tank of insulating gas; these can achieve potentials of as much as about 25 megavolts.



P.S.S.S.Venkata Ramesh
15VV1A0246

B BATTERIES

Practical batteries were introduced to the public in the early 1800s, and today they help you keep your remote controls, flashlights, and kids' toys working properly. But if you need to pick a battery you likely carry AA, AAA, C, D....Then what about B batteries? There actually are B batteries, but they aren't something you'll usually see stocked at most stores any longer. Since the invention of the battery, there have been a pretty amazingly diverse number of battery types used with different sizes/shapes/voltages/storage capacities/etc., and also named a variety of things. This gave rise to the need for an industry wide standard, particularly as the lack of an international or even national standard during WWI was problematic for the military. As such, after WWI, the War Industries Board and several other government agencies got together to try to come up with standard specifications for batteries. A few years later, in 1928, the American Standards Association, the predecessor to the American National Standards Institute (ANSI), officially

adopted this proposal, introducing a list of battery cell sizes and their corresponding label. For these labels, they used the suggested convention that A would be the smallest; as went up in the letters, the batteries would get larger in size. There was also a "No. 6" battery that was the largest. This was just adopted as it had previously been one of the most popular battery cell sizes used (a 6 inch battery), so it was grandfathered in, though now given more strict guidelines to its exact specifications. Others came along later, such as the AAA size, which wasn't adopted into the standard until 1959. Since then, the ANSI standard for batteries

has been revised numerous times as battery technology has evolved. Why it appears there is no B (or A, F, etc.) anymore is simply because those particular battery sizes never really caught on commercially, at least on the consumer end of things. The ones that were most popular just ended up being the AA, AAA, C, and D. Now-a-days, because those are the most commonly available to consumers, most manufactures continue to use those battery types over the many other sizes that are available to power their devices. However, B batteries are still made and sold and pack a decent punch for their size, 21.5 mm x 60 mm (.8464 in. by 2.36 in.), producing 1.5 volts and 8350 mAh for the alkaline variety. (For reference, standard alkaline AA's ring in at 1.5 volts and 2700 mAh). 'A' batteries are also still in production, last most commonly used in early-model laptop battery packs. F batteries, on the other hand, are still commonly used within something you can find at your local supermarket- rectangular 6 volt batteries. You'll sometimes hear that B batteries are no longer seen because they were primarily used in devices that used vacuum tubes (most commonly radios), specifically used as a battery to provide the plate voltage for the vacuum tube. Thus, as tube radios aren't too common anymore, the need for B batteries went away with them. This isn't quite accurate. The B battery in the ANSI standard does not have the same specifications as the 'B' battery used with vacuum tubes. The 'B' battery in this case can refer to any single or group of cells used to give the plate a positive charge in order to draw the electrons from the filament. The voltage for these 'B' batteries first started out often needing 120 volts, then later typically needing 90, 67.5, 45, and 22.5 (the value kept going down as tubes gradually became more efficient over time). Certainly actual ANSI standard 'B' batteries could be combined and used for this type of application, but really any battery or group of cells worked and would still be called a 'B' battery in this context, thanks to the naming convention adopted for this use (A, B, and C, which specified what the battery was used for in the device, rather than the ANSI standard battery specification).

Pappu Bhavani Bhargav Raj
15VV1A0223

Battery

Background

Benjamin Franklin's famous experiment to attract electricity by flying a kite in a lightning storm was only one of many late eighteenth- and early nineteenth-century experiments conducted to learn about electricity. The first battery was constructed in 1800 by Italian Alessandro Volta. The so-called voltaic pile consisted of alternating discs of silver and zinc separated by leather or pasteboard that had been soaked in salt water, lye, or some alkaline solution. Strips of metal at each end of the pile were connected to small cups filled with mercury. When Volta touched both cups of mercury with his fingers, he received an electric shock; the more discs he assembled, the greater the jolt he received.

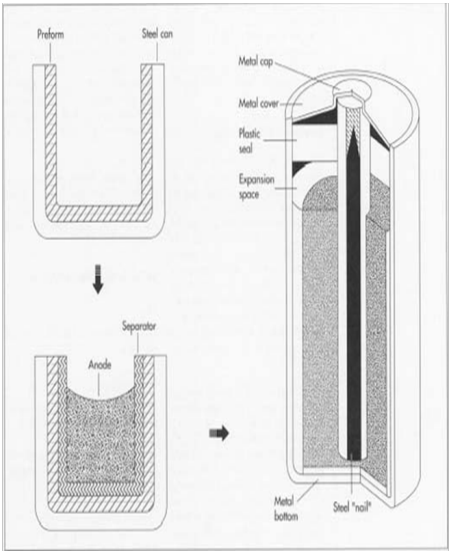
Design

All batteries utilize similar procedures to create electricity; however, variations in materials and construction have produced different types of batteries. Strictly speaking, what is commonly termed a battery is actually a group of linked cells. The following is a simplified description of how a battery works.

Two important parts of any cell are the anode and the cathode. The cathode is a metal that is combined, naturally or in the laboratory, with oxygen—the combination is called an oxide. Iron oxide (rust), although too fragile to use in a battery, is perhaps the most familiar oxide. Some other oxides are actually strong enough to be worked (cut, bent, shaped, molded, and so on) and used in a cell. The anode is a metal that would oxidize if it were allowed to and, other things being equal, is more likely to oxidize than the metal that forms part of the cathode.

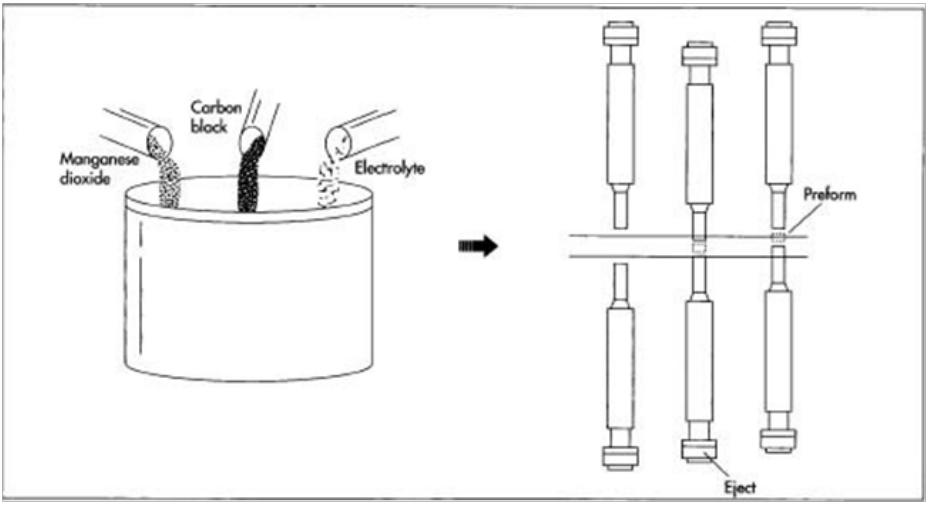
A cell produces electricity when one end of a cathode and one end of an anode are placed into a third substance that can conduct electricity, while their other ends are connected. The anode draws oxygen atoms toward it, thereby creating an electric flow. If there is a switch in the circuit (similar to any wall or lamp switch), the circuit is not complete and electricity cannot flow unless the switch is in the closed position. If, in addition to the switch, there is something else in the circuit, such as a light bulb, the bulb will light from the friction of the electrons moving through it. The third substance into which the anode and the cathode are placed is called an electrolyte. In many cases this material is a chemical combination that has the property of being alkaline. Thus, an alkaline battery is one that makes use of an alkaline electrolyte. A cell will not produce electricity by itself unless it is placed in a circuit that has been rendered complete by a simple switch, or by some other switching connection in the appliance using the battery.

Different batteries function better in different circumstances. The alkaline 1.5 volt cell is ideal for photographic equipment, handheld computers and calculators, toys, tape recorders, and other "high drain" uses; it is also good in low temperatures. This cell has a sloping discharge characteristic—it loses power gradually, rather than ceasing to produce electricity suddenly—and will lose perhaps four percent of its power per year if left unused on a shelf.



Raw Materials

This section, as well as the following section, will focus on alkaline batteries. In an alkaline battery, the cylinder that contains the cells is made of nickel-plated steel. It is lined with a separator that divides the cathode from the anode and is made of either layered paper or a porous synthetic material. The



canister is sealed at one end with an asphalt or epoxy sealant that underlies a steel plate, and at the other with a brass nail driven through the cylinder. This nail is welded to a metal end cap and passed through an exterior plastic seal. Inside the cylinder, the cathode consists of a mixture of manganese dioxide, graphite, and a potassium hydroxide solution; the anode comprises zinc powder and a potassium hydroxide electrolyte.Environmental Issues

The major potential pollutant in batteries is mercury, which commonly accompanies zinc and which was for many years added to alkaline batteries to aid conductivity and to prevent corrosion. In the mid-1980s, alkaline batteries commonly contained between five and seven percent mercury.

Batteries with no added mercury at all (it is a naturally occurring element, so it would be difficult to guarantee a product free of even trace qualities) are available from some manufacturers and will be the industry-wide rule rather than the exception by the end of 1993.

The Future

Batteries are currently the focus of intense investigation by scientists and engineers around the world.

Read more: http://www.madehow.com/Volume-1/Battery.html#ixzz4szcB21Zz

Md.Shahera Begum
15VV1A0201

Mother Teresa

Mother Teresa was born Agnes Gonxha Bojaxhiu in Skopje*, Macedonia, on August 26**, 1910. Her family was of Albanian descent. At the age of twelve, she felt strongly the call of God. She knew she had to be a missionary to spread the love of Christ. At the age of eighteen she left her parental home in Skopje and joined the Sisters of Loreto, an Irish community of nuns with missions in India.

After a few months' training in Dublin she was sent to India, where on May 24, 1931, she took her initial vows as a nun. From 1931 to 1948 Mother Teresa taught at St. Mary's High School in Calcutta, but the suffering and poverty she glimpsed outside the convent walls made such a deep impression on her that in 1948 she received permission from her superiors to leave the convent school and devote herself to working among the poorest of the poor in the slums of Calcutta.

Although she had no funds, she depended on Divine Providence, and started an open-air school for slum children. Soon she was joined by voluntary helpers, and financial support was also

forthcoming. This made it possible for her to extend the scope of her work.

On October 7, 1950, Mother Teresa received permission from the Holy See to start her own order, "The Missionaries of Charity", whose primary task was to love and care for those persons nobody was prepared to look after. In 1965 the Society became an International Religious Family by a decree of Pope Paul VI.

Today the order comprises Active and Contemplative branches of Sisters and Brothers in many countries. In 1963 both the Contemplative branch of the Sisters

and the Active branch of the Brothers was founded. In 1979 the Contemplative branch of the Brothers was added, and in 1984 the Priest branch was established.

The Society of Missionaries has spread all over the world, including the former Soviet Union and Eastern European countries. They provide effective help to the poorest of the poor in a number of countries in Asia, Africa, and Latin America, and they undertake relief work in the wake of natural catastrophes such as floods, epidemics, and famine, and for refugees. The order also has houses in North America, Europe and Australia, where they take care of the shut-ins, alcoholics, homeless, and AIDS sufferers.

The Missionaries of Charity throughout the world are aided and assisted by Co-Workers who became an official International Association on March 29, 1969. By the 1990s there were over one million Co-Workers in more than 40 countries. Along with the Co-Workers, the lay Missionaries of Charity try to follow Mother Teresa's spirit and charism in their families.

Mother Teresa's work has been recognised and acclaimed throughout the world and she has received a number of awards and distinctions, including the Pope John XXIII Peace Prize (1971) and the Nehru Prize for her promotion of international peace and understanding (1972). She also received the Balzan Prize (1979) and the Templeton and Magsaysay awards.

From Nobel Lectures, Peace 1971-1980, Editor-in-Charge Tore Frängsmyr, Editor Irwin Abrams, World Scientific Publishing Co., Singapore, 1997

This autobiography/biography was written at the time of the award and first published in the book series Les Prix Nobel. It was later edited and republished in Nobel Lectures. To cite this document, always state the source as shown above.

* Former Uskup, a town in the Ottoman Empire.

** Mother Teresa's date of birth is disputed: "So unconcerned was she about accuracy in relation to the chronicling of her own life, and so disinclined actually to read anything written about her, that for many years and in a succession of books her birthdate was erroneously recorded as 27 August 1910. It even appeared in the Indian Loreto Entrance Book as her date of birth. In fact, as she confided to her friend, co-worker and American author, Eileen Egan, that was the date on which she was christened Agnes Gonxha Bojaxhiu. The date which marked the beginning of her Christian life was undoubtedly the more important to Mother Teresa, but she was none the less actually born in Skopje, Serbia, on the previous day." (Spink, Kathryn: Mother Teresa: A Complete Authorized Biography, HarperSanFrancisco, 1997.

Mother Teresa died on September 5, 1997.

M.B.K.Akarsha
15VV1A0238

Facts

1. Pteronophobia is the fear of being tickled by feathers!
2. When hippos are upset, their sweat turns red.
3. A flock of crows is known as a murder.
4. "Facebook Addiction Disorder" is a mental disorder identified by Psychologists.
5. The average woman uses her height in lipstick every 5 years.
6. 29th May is officially "Put a Pillow on Your Fridge Day".
7. Cherophobia is the fear of fun.
8. Human saliva has a boiling point three times that of regular water.
9. If you lift a kangaroo's tail off the ground it can't hop.
10. Bananas are curved because they grow towards the sun.
11. The person who invented the Frisbee was cremated and made into a frisbee after he died!
12. During your lifetime, you will produce enough saliva to fill two swimming pools.
13. If Pinokio says "My Nose Will Grow Now", it would cause a paradox.

14. Polar bears can eat as many as 86 penguins in a single sitting. (If they lived in the same place)

15. King Henry VIII slept with a gigantic axe beside him.

B.Sai Naveen
15VV1A0230

CURRENT AFFAIRS

GK Current Affairs Quiz: 2017

1.Which of the following canals is considered to be an important link between the developed countries and the developing countries?
[A] Panama Canal
[B] Suez Canal
[C] Kiel Canal
[D] Grand Canal

2.Which of the following is NOT a petrochemical centre of India?
[A] Koyali
[B] Jamnagar
[C] Mangalore
[D] Rourkela

3.Which of the following is a correct sequence of sea ports of India from "South to North"?
[A] Cochin →Thiruvananthapuram→Calicut→Mangalore
[B] Calicut→ Thiruvananthapuram→ Cochin→ Mangalore
[C] Thiruvananthapuram→ Cochin→ Calicut→ Mangalore
[D] Thiruvananthapuram→ Calicut→ Mangalore→ Cochin

4.Myanmar does not share its international boundary with__?
[A] Laos
[B] Thailand
[C] Vietnam
[D] India

5.Which of the following countries is not a part of Melanesia region in the pacific ocean?
[A] Vanuatu
[B] Solomon Islands
[C] Fiji
[D] Kiribat

i6.Which of the following is not a feature of the Eutrophic lakes?
[A] They are generally occupied by blooms
[B] They have high plant nutrient flux
[C] They have low primary productivity
[D] They are dominated by blue green algae

7.The prime minister of India

can not participate in voting on a No-confidence motion against his / her government if he / she __:
[A] leads a coalition government
[B] has minority in Rajya Sabha
[C] is a member of Rajya Sabha
[D] forbidden by speaker of Lok Sabha

8.How many presidents of India so far were elected unopposed?
[A] One
[B] Two
[C] Three
[D] Four

9.Areas of which of the following current states did not come under control of Vijayanagar emperor Krishnadeva Raya?
[A] Kerala
[B] Tamil Nadu
[C] Odisha
[D] Maharashtra

10.Which of the following monasteries is known as Galden Namgey Lhatse?
[A] Hemis Monastery
[B] Tawang Monastery
[C] Bomdila Monastery
[D] Namdroling Monastery

A.Apurva
16VV5A0263

KNOW YOUR EXAM

Things you must know before you start preparing for UPSC civil services examination

One of the most competitive and prestigious exams, civil services, is conducted by the Union Public Service Commission (UPSC). If you are planning to appear for UPSC 2016, you need to get acquainted with the factors mentioned below.

Preparing for UPSC civil services examination?

One of the most competitive and prestigious exams, civil services, is conducted by the Union Public Service Commission (UPSC), India's major regulating body. UPSC also conducts a number of competitive exams to fill-in various civil service vacancies for the government of India. The UPSC conducts the Civil Services Examination (CSE), popularly known as IAS (Indian Administrative Service) exam, in two phases namely- UPSC Prelims and UPSC Mains. The prelims exam comprises objec-

tive-type questions, while the questions asked in mains need descriptive and essay-type answering.

If you are planning to appear for the UPSC 2016 exam, you need to get acquainted with the factors mentioned below:

The exam dates

The exam dates are subject to change as per the UPSC guidelines. So, an aspirant is required to keep an eye on the new dates released by the commission on the official website.

Why IAS?/PI quotient

Before stepping into the preparation of one of the most competitive exams in the nation, an aspirant must get his/her PI (personal interview) quotient scoped-out . During personality test, a candidate's candidature would be measured against his/her performance. Once he/she gets the PI quotient evaluated, the candidate would have a clearer mindset throughout the preparation.

The subsets of IAS

IPS, IRS, IFS fall under the aegis of the IAS exam and the cut-off to get recruited in the services mentioned above is decided after the conduction of the exam. A good understanding of the target is what will streamline the preparation and to keep the focused better.

IPSÂ¬ Indian Police Service

IRSÂ¬ Indian Revenue Service

IFSÂ¬ Indian Foreign Service

How do you think you can contribute?

Before one starts with the preparation, he must prove his caliber and ask himself what changes can he bring about as an IAS officer. A candidate's plan need not to be monumental but should be cogent enough to set him apart from the other aspirants. Apparent answers to such questions will give a candidate an edge over all the other applicants in the interview session.

Preparation technique:

It is not an exaggerated fact that IAS is the nation's toughest competitive exam and calls for intensive practice and preparation.There is no definite answer to the most commonly asked questions, such as how many hours an IAS aspirant need to put in every day? It will differ from person to person so let us look at it from a general perspective.

Time required:

Experts believe that aggressive preparation for 10 to 12 months is a must. Four out of every 10 Indians (21-32 years) aspire to become an IAS officer and competition is so intense that only 5 percent of that massive number gets through. An aspirant must map-out an effective strategy and decide ideal number of hours required to implement that strategy.

An aspirant should also understand that preparation for civil services examination calls for qualitative and not quantitative preparation. It is about completion of your short term target. Ideally you should target two subjects every day. Most of the top rankers have started preparing for the exams right from their school days, as most of the questions are asked mostly from Class 6 to 12 standard books. So preparing notes and devoting 10 to 12 hours before a year of exam is believed to be sufficient.

Outline the syllabus and design your preparation

If you have studied biology, you would definitely be familiar with a word "catabolism". It is a process in which original components are broken down into their by-products. You can do the same with your IAS syllabus. Find out the topics you are good at and the topics you would need help in. Do it for all the subjects and work upon them.

Objectifying the syllabus

Most of the IAS aspirants get discouraged seeing the bulk of IAS syllabus. No doubt the syllabus is huge, but if you divide the subjects into manageable chunks, then impossible looking tasks will become easier for you.

Enjoy your preparation

Unarguably, UPSC preparation is a lengthy process. But the moment you start enjoying your preparation, all the unwarranted stress and anxiety associated with the preparation will vanish. Civil services examination aspirants tend to give up their hobbies, but pursuing your hobbies side by side will make your preparation more fun.

With inputs from Mr. AK Mishra (Founder and Managing Director, Chanakya IAS Academy)

M.Appala Naidu
15VV1A0249

NO second chance to gain first Impression

Have you ever been in the situation when you really didn't believe what someone was saying? Did you have a sense that something didn't ring true or a gut feeling that all was not right? Perhaps they were saying "Yes" yet their heads were shaking "No"?

The difference between the words people speak and our understanding of what they are saying comes from non-verbal communication, otherwise known as "body language." As you will learn in this article and video, by developing your awareness of the signs and signals of body language, you can more easily understand other people, and more effectively communicate with them.

There are sometimes subtle – and sometimes not so subtle – movements, gestures, facial expressions and even shifts in our whole bodies that indicate something is going on. The way we talk, walk, sit and stand all say something about us, and whatever is happening on the inside can be reflected on the outside.

By becoming more aware of this body language and understanding what it might mean, you can learn to read people more easily. This puts you in a better position to communicate effectively with them. What's more, by increasing your understanding of others, you can also become more aware of the messages that you convey to them.

There are times when we send mixed messages – we say one thing yet our body language reveals something different. This non-verbal language will affect how we act and react to others, and how they react to us.
This article will explain many of the ways in which we communicate non-verbally, so that you can use these signs and signals to communicate more effectively.

First Impressions and Confidence

Recall a time when you met someone new at work. Or think about the last time you watched a speaker deliver a presentation.What were your first impressions ? Did you sense confidence or a lack of confidence in them? Did you want to associate with them or not? Were you convinced by them?

Did they stride into the room, engage you and maintain eye contact or were they tentative, shuffling towards you with eyes averted, before sliding into a chair? What about their handshake – firm and strong or weak and limp?

Moving along in the conversation, did they maintain solid eye contact or were they frequently looking away? Did their face appear relaxed or was it tight and tense? What about their hand and arm movements? Were their gestures wide, flowing and open or were they tight, jerky and closed?

As you observe others, you can identify some common signs and signals that give away whether they are feeling confident or not. Typical things to look for in confident people include:

- Posture – standing tall with shoulders back.
- Eye contact – solid with a "smiling" face.
- Gestures with hands and arms – purposeful and deliberate.
- Speech – slow and clear.
- Tone of voice – moderate to low.

As well as deciphering other people's body language, you can use this knowledge to convey feelings that you're not actually experiencing.
For example, if you are about to enter into a situation where you are not as confident as you'd like to be, such as giving a big presentation or attending an important meeting, you can adopt these "confidence" signs and signals to project confidence.
Let's now look at another scenario.

...to be continued in next issue

B.Vara Lakshmi
15VV1A0218

Put your grey cells to work

1. 6 = 12, 3= 6, but 5 does not = 10, how come?

2. What 8 letter word can have a letter taken away and it still makes a word. Take another letter away and it still makes a word. Keep on doing that until you have one letter left. What is the word?

3. The more you take, the more you leave behind. What am I?
Answer:
Footsteps.

4. Can you name three consecutive days without using the words Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, or Sunday?

5. What begins with T, ends with T, and has T in it?

6. It's been around for millions of years, but is never more than a month old. What is it?

7. I live in my little house all alone. There are no windows or doors, and if I want to go out I have to break through the wall. What am I?

8. Three doctors said that Bill was their brother. Bill said he had no brothers. Who was lying?

9. I am a box that holds keys without locks, yet my keys can unlock your deepest senses. What am I?

10. What has one eye but cannot see?

Conquering Stage Fright

You may have heard the joke that some people would prefer to be in their own coffins than give a eulogy at a funeral. While this may be an exaggeration, many would agree.

Most of us feel a degree of nervous apprehension when preparing to speak up or perform in front of a group. But those who are filled with feelings of dread and panic in such a situation—or anywhere the person might be center of attention—may be suffering from a form of social anxiety disorder (also known as social phobia).

The fear of public speaking or performance, often called stage fright, exacts a huge toll on self-confidence and self-esteem and causes some people to leave school or a job or pass up a promotion. Many, including seasoned professional performers, suffer in silent terror. And because they feel embarrassed, people try to keep their fear a secret, even from a spouse or other close family members or friends.

Taking Steps to Overcome Your Fear

Learning to improve your speaking or performance skills is good, but it's generally not enough to substantially reduce your fear. You must address and revise any negative perceptions, beliefs, thoughts, images, and predictions related to public speaking or performing. And it's often helpful to uncover the deeper fears related to being seen and heard by others, showing vulnerability, and being considered less than perfect. Learning to accept yourself and not feeling that you have to prove yourself to others is at the root of healing.

It is recommended that you learn skills to reduce and manage your fear and anxiety and not resort to using medication or natural products alone. It's also critical to learn cognitive-behavioral methods to stop the cycle of avoiding fearful situations. Avoidance may give you immediate relief, but it reinforces your fear in the long run.

If you are willing stop avoiding your fears and learn new skills to reduce and manage them, you will develop an empowering belief and trust in yourself. In facing your fear, it becomes possible to overcome performance anxiety and find comfort and ease in expressing yourself in front of others.

Try these 10 tips to reduce your stage fright:

Shift the focus from yourself and your fear to your true purpose—contributing something of value to your audience.

Stop scaring yourself with thoughts about what might go wrong. Instead, focus your attention on thoughts and images that are calming and reassuring.

Refuse to think thoughts that create self-doubt and low confidence.

Practice ways to calm and relax your mind and body, such as deep breathing, relaxation exercises, yoga, and meditation.

Exercise, eat well, and practice other healthful lifestyle habits. Try to limit caffeine, sugar, and alcohol as much as possible.

Visualize your success: Always focus on your strength and ability to handle challenging situations.

Prepare your material in advance and read it aloud to hear your voice.

Make connections with your audience: Smile and greet people, thinking of them as friends rather than enemies.

Stand or sit in a self-assured, confident posture. Remain warm and open and make eye contact.

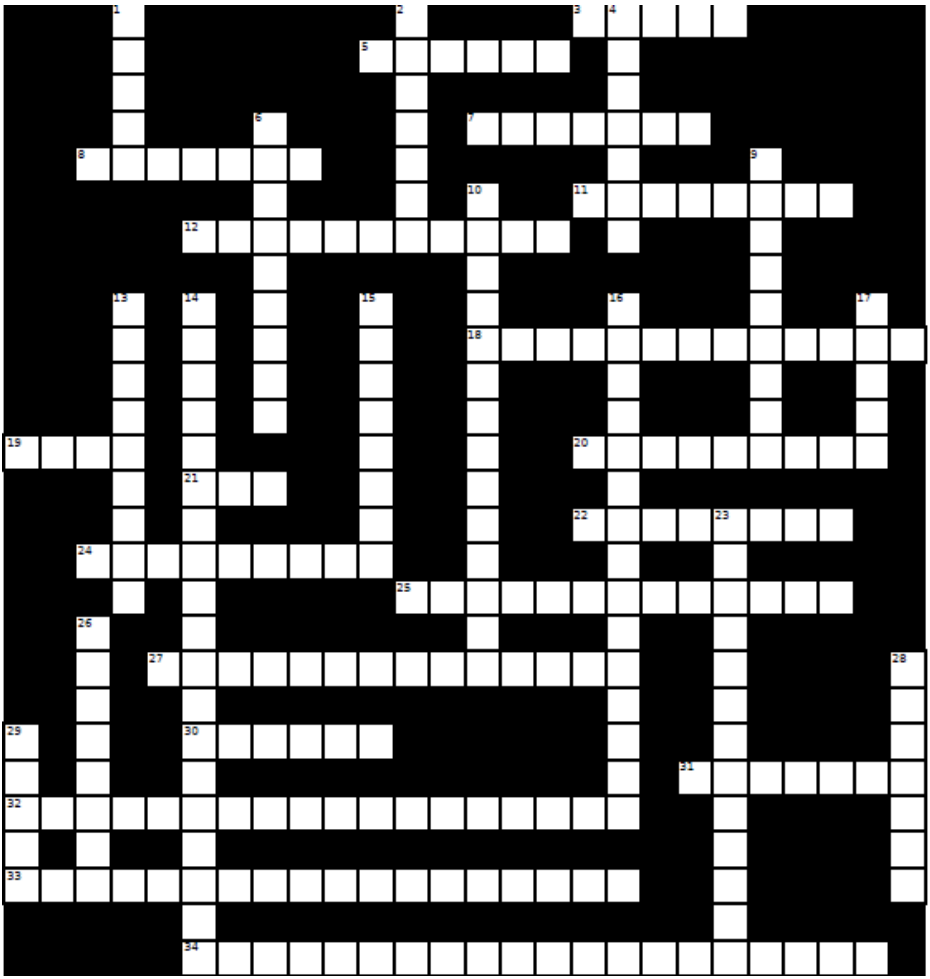
Give up trying to be perfect and know that it is OK to make mistakes. Be natural, be yourself.

Scientific References

Stein, M.B., Walker, J.R., & Forde, D.R. (1996). Public speaking fears in the community

Ch.Harsha
15VV1A0235

The Electrical Crossword Puzzle



Across

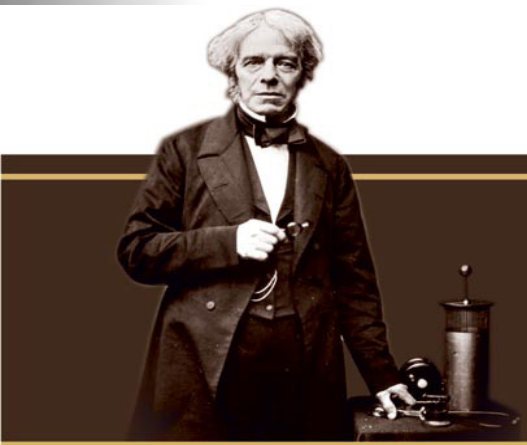
3. The unit of electrical power
5. A measurement of energy
7. A composition of two or more cells
8. These have a postive charge
11. These have a neutral charge
12. Relationship among electrical force, charges, and distance
18. A thick area of a bulb where electricity can pass through
19. The measurement for electrical resistance
20. These have a negative charge

21. Then end of a light bulb where electricity can pass through
22. This will restrain the flow of charge in a circuit
24. This acts as a storage unit of electricity when charged in a circuit
25. The flowing of charges in one direction
27. Used as a form of safety fuses in a circuit
30. A measure of capacitance
31. Any path along which electrons can flow
32. The flow of electric charge through a circuit
33. Electrically charged particles that repeatedly reverse directions
34. An act that restrains electrical current

Down
1. The product of curren and voltage
2. Unit of electrical charge
4. The unit of measure for electric current
6. Causes breaks in an open loop
9. A good emitter
10. The mutual attractions or repulsions between electrons or protons is attributed
13. The electrical resistance is directly proportional to the voltage per current
14. When the ends of an electrical conductor are a different electric potentials
15. This liquid reduces the human body's resistance to 100 ohms
16. Electrical devices are connected in sucha way that the same voltage acts across each one and any single one completes the circuit independently of all others
17. The measurement for voltage
23. Electrical devices are connected in such a way that the same electric current exists in all of them
26. Thin wire that conducts electricity through a light bulb
28. The flow of charge across the circuit
29. The Greek letter representing resistance

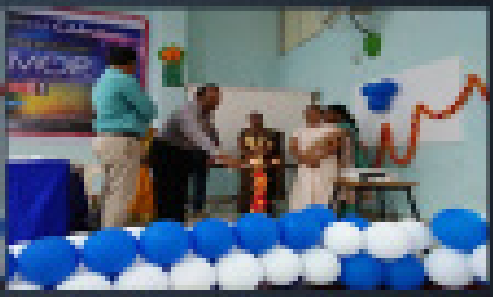
A.Sudheer Kumar
15VV1A0231

CARPEDIUM



MICHAEL FARADAY

EEE gallery
The MEMOIR 2K16



FARADAY MEMORIAL 2K17
22ND SEPT

THE MEMOIR

The Chronicles of EEE

Vol 4
SEP 2017
EEE

EEE KLAB
inaugurated on 22nd

FARADAY MEMORIAL

22 Sept 1791 - 25 Aug 1867

JNTUK UCEV

For feedback send us on: memoir2017@gmail.com

follow us on: memoir