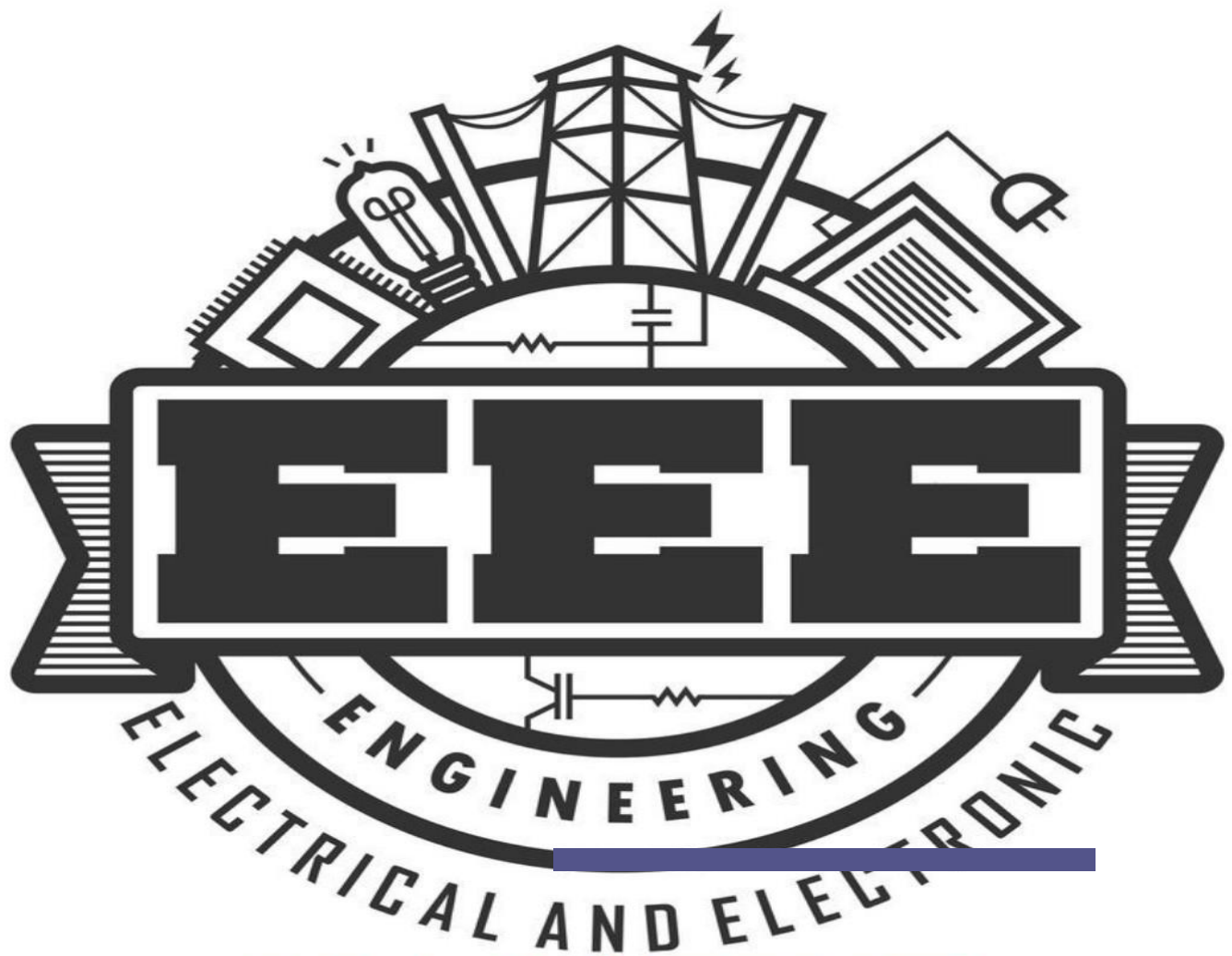




Autonomous | Affiliated to Anna University, Chennai  
Accredited by NAAC with 'A' Grade | NBA (ECE, EEE, CSE, MECH & IT)

# IMPULSE 21K



# MAGAZINE

## 2020-2021

## **VISION**

**To provide students with sound knowledge of Electrical and Electronics Engineering, that they become capable of facing the current and impending challenges to extend their expertise in the global arena.**

## **MISSION**

- **Impart high quality education and training to the students in the field of Electrical and Electronics Engineering.**
- **Transforming our students into enterprising technologists by giving them excellent facilities by qualified, committed members of faculty.**
- **Motivating them to contribute immensely for the benefit of the entire humanity.**

## Program Educational Objectives (PEOs)

**PEO1:** Graduates will synthesize mathematics, science, engineering fundamentals, laboratory and work-based experiences to formulate and solve problems in Electrical and Electronics engineering and the related domains and will develop proficiency in Computer-based engineering and the use of computational tools.

**PEO2:** Graduates will communicate and work team-based on the multidisciplinary engineering projects in the allied fields of Electrical Science and will practice the ethics of their profession.

**PEO3:** Graduates will realize the importance of self-learning and engage in lifelong learning to become experts either as an entrepreneur or an employee so as to broaden their knowledge in the domain.

## Program Outcomes (POs)

### Engineering Graduates will be able to:

- PO 1      Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- PO 2      Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO 3      Design/ Development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO 4      Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO 5      Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- PO 6      The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- PO 7      Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- PO 8      Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- PO 9      Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multi disciplinary settings.
- PO 10      Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO 11      Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO 12      Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

## **PROGRAM SPECIFIC OUTCOMES (PSOs)**

**Engineering Graduates will be able to:**

**PSO1** Apply the knowledge in the field of electrical and electronics engineering to analyse, design and develop solutions for real world problems.

**PSO2** Demonstrate the skill in core and allied domain to work in interdisciplinary teams.

## Chairman & Managing Trustee



*It is the matter of pride to know the release of annual magazine “IMPULSE 21K” of Electrical and Electronics Engineering Department.*

*The name and fame of an institute depends on the competence and achievements of the students and the faculty. In addition to the numerous achievements of the year is yet another mile stone in their curricular. I hope this magazine will bring out creative talents of the students of the institute.*

*I congratulate the Principal, HoD, Staffs and Students for publishing “IMPULSE 21K”. My best wishes for the success of the effort of the department.*

***Dr.R.Vasanthakumar***

***Chairman & Managing trustee***

## Chief Executive Officer



*I am happy that Electrical and Electronics Engineering Department of Karpagam College of Engineering is releasing annual magazine “IMPULSE 21K”.*

*Apart from achieving excellence in academics and sharpening technical skills it is important for students to develop leadership skills and capacity to innovate for social causes to make them resourceful and employable.*

*I extend my best wishes to the team to make this magazine “IMPULSE 21K” a memorable one.*

***Shri.K.Murugaiah CEO***

***Karpagam Educational Institutions***

## Principal



*I feel extremely amusement to observe that of Electrical and Electronics Engineering Department is bringing out annual magazine “IMPULSE 21K” with the dedicate and committed efforts of faculty and students of the department.*

*This magazine is the reflection of the students, involved in various activities. I congratulate the HoD, the faculty members and the students of electrical and electronics engineering department for their ingenuity and enthusiasm for this magazine and wish them all success.*

**Dr.P.Vijayakumar**

**Principal**



## Head of the Department



*I feel privileged in presenting the magazine “IMPULSE 21K” of our department. This magazine is intended to bring out the hidden literary talents among the students and the faculty and also to inculcate leadership skills among them.*

*I am sure it will be a source of inspiration for the budding poets and writers among the students and will direct their creativity to new dimensions of mature expression.*

*I extend my sincere thanks to the editorial team for their constant effort and support in bringing out the magazine in the present form. I acknowledge my gratitude to our principal for their continuous support to prepare these issues of magazine.*

*Last but not least; I am thankful to all the authors who have sent their articles.*

***Dr.C.R.Balamurugan***

***Head of the Department***

## **Editorial Board**

### **Faculty coordinator**

**Mrs. A. Anci Manon Mary, AP/EEE**

### **Student council**

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Ms. Abinaya.S (IV EEE B)  
Mr.DhineshKumar.A (III EEE A)  
Ms.JananiPreethi.R (III EEE B)  
Mr.SabarishShetty.G (II EEE A)  
Ms.Gayathri .S.Y (II EEE B)**

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# Technical Article

## Technologies 2050: Awesome innovations in the future

### Artificial eyes:

A trend started by alastor “Mad eye” moody from harry potter researchers are working in it to make this a reality. In january 2021, Israel Implanted the first artificial cornea into a blind 72-year-old man.

### Bricks with energy:

Scientist have found a way to store energy in the bricks . Researchers in washington had found this.

### Electric cars:

Car batteries are lasting longer, the charging station Infrastructure is growing and self-driving technology is heavily being invested in meaning. Tesla has some complex auto- pilot that can take over some driving controls.



### Flying cars:

When there is no space left on the road, it is not reasonable to think we might fly on skies. There are many flying cars that show this future is a realistic possibility. Example-jetcars.



### James mickson:

Assistant professor of Harvard university, Commented “Technology will result in a civic innovation”. The question is evolve to exploit the advantages odd new tech and mitigate problems.



### Airports for drones and flying taxis:

Our congested cities are in desperate need of a breather and relief may come from the air as opposed to the roads. Plans for a different kind of transport hub one for delivery drones and electric air-taxis are becoming a reality, with the first receiving funding from the UK government.

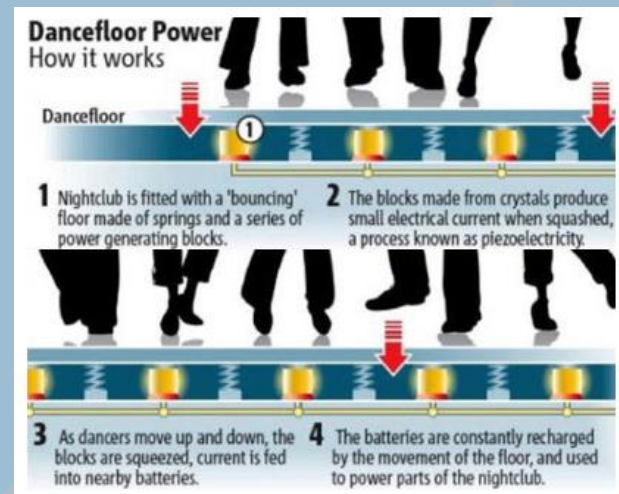
*-Manikandan. S (18E217)*

## *Dancefloor generates electricity at London's first eco-disco!*

Despite its relative simplicity, the composite generates a much higher power density than other devices with a similar structure and has an energy conversion efficiency of seven percent. Wang told us that if the nanogenerator were to be embedded in a pair of shoes, an average-build person could generate around 3W just by walking. For reference, that would be roughly enough to power an iPad 2 (if you wanted to power the new iPad, however, you'd have to either pick up your pace or put on a few pounds).

Preliminary durability studies have confirmed that, even after thousands of cycles in which the material was

repeatedly bent and released, the nanogenerator consistently produced the same amount of electric current, with no noticeable degradation in performance.



- Divya Priya R (19E112)

## *The Bendy Touchpad*

Scientists have recently developed a new type of touchpad. This touch pad can bend in different ways and still keep its touch screen properties. This tech is being developed all over the world to help with electronics such as touch screen phones or tablets. It could even be used in clothes, prosthetic limbs, or even the human body itself. This new technology is made with hydrogel, the same material used in contact lenses. The materials required to make this device is fairly cheap and may be helpful in the near future. Scientists are still working to make the touchpad more durable and stronger.

I think that this is a great achievement in touchpad technology. I feel that this may be a great help with iPhones and the issue of their screens cracking after one drop. It could also help other devices and give them to

stronger screens. I think that the fact this could be woven into clothing is very interesting and reminds me of a fabric that did the exact same thing in Mission Impossible: Rogue Nation. I feel that scientists could release this to electronics' companies and help make the screens stronger. I like this device a lot and I think it will impact many things in our everyday society for the better.

- Akshaya Prasaath V  
(19E106)

## *New Wind Turbine Generates Electricity without Rotating Blades*

This new wind turbine wobbles elegantly in the wind, generating electricity without rotating blades. “It looks like asparagus,” A Spanish company called Vortex Bladeless has produced a wind turbine that takes advantage of the vortices produced when wind moves around an obstacle. If you put any object in the path of the wind, it will create an undulating vortex behind the barrier. This is a problem that has plagued engineers for years: bridges have fallen due to wind eddies. Vortex Bladeless engineers have designed their turbine to take advantage of this vortex. The thin, cone-shaped turbine is made of carbon fiber and fiberglass with the motor at the bottom instead of the top (like traditional turbines) to improve sturdiness. The design ensures that the wind’s vortex spins synchronously along the

entire cone.

“The swirls have to work together to achieve good performance,” Villarreal explains. There is also a ring of magnets at the base of the cone that give the rotations a boost regardless of wind speed.

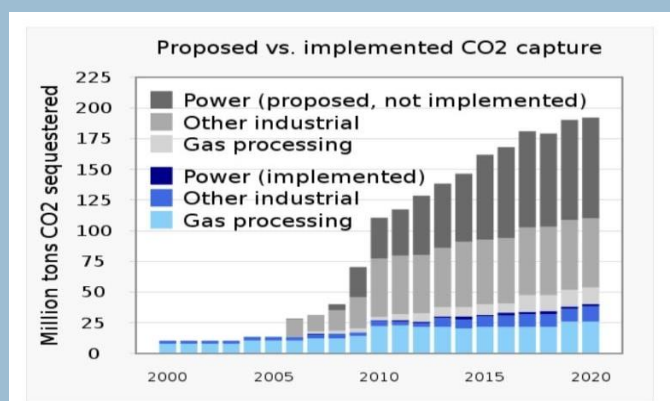


- Gayathíry S Y (19E211)

## *Carbon capture and Storage*

Carbon capture and storage (CCS) or carbon capture and sequestration is the process of capturing carbon dioxide (CO<sub>2</sub>) before it enters the atmosphere, transporting it, and storing it (carbon sequestration) for centuries or millennia. Usually the CO<sub>2</sub> is captured from large point sources, such as coal-fired power plant, a chemical plant or biomass power plant, and then stored in an underground geological formation. The aim is to prevent the release of CO<sub>2</sub> from heavy industry with the intent of mitigating the effects of climate change.[3] Although CO<sub>2</sub> has been injected into geological formations for several decades for various purposes, including enhanced oil

recovery, the long-term storage of CO<sub>2</sub> is a relatively new concept. Carbon capture and utilization (CCU) and CCS are sometimes discussed collectively as carbon capture, utilization, and sequestration (CCUS). This is because CCS is a relatively expensive process yielding a product with an intrinsic low value (i.e. CO<sub>2</sub>).





Hence, carbon capture makes economically more sense when being combined with a utilization process where the cheap CO<sub>2</sub> can be used to produce high-value chemicals to offset the high costs of capture operations. Global proposed vs. implemented annual CO<sub>2</sub> sequestration. More than 75% of proposed gas processing projects have been implemented, with

corresponding figures for other industrial projects and power plant projects being about 60% and 10%, respectively.

- *Aishwarya D (19E103)*

## *Sweden Successfully Tests Wireless Charging Road Set to Revolutionize Mobility*

Battery-electric vehicles (BEV) are evolving and gaining popularity at an accelerated pace. While much progress has been made in terms of hardware and infrastructure, recharging still takes significantly more time than refueling an ICE- or hydrogen-powered vehicle. Thinking outside of the (wall) box, Israeli tech company ElectReon has been developing and implementing an innovative solution for this problem. The system that is set to revolutionize transportation and accelerate the switch to electric mobility uses copper coils fitted under the asphalt, enabling EVs to charge their batteries wirelessly while on the move.

Like the technology used by our smart devices, the system needs vehicle-mounted receivers to work. According to the company, this is something that has not been implemented yet as a factory feature by any renowned carmaker but can be easy and cost-effective

to add on existing and future EV models. In terms of logistics, the only inconvenience is that a portion of the asphalt needs to be removed and replaced. Other than that, the system can connect to existing power grids without the need for additional infrastructure or transformation stations. It uses management units placed on the sides of the road to communicate with the receivers on the vehicles and transfer energy. ElectReon is involved in multiple pilot programs to test the feasibility of this technology. Recently, the company has completed the deployment of its dynamic wireless charging system on a 1.65-km (1.02-mile) public road in Gotland, Sweden. After performing several tests to make sure the system is stable, a fully electric long-haul truck was the first vehicle to be charged wirelessly by the Swedish smart road.

- *SIVA BALA L(19E131)*

## *GaN shines a light on PV inverter efficiency*

When it comes to solar as a renewable power source, there have been two main challenges – efficiency and cost. While there has been massive improvement over the years, today's 360 W to 400 W panels using the latest photovoltaic (PV) technologies still only offer around 20% efficiency when it comes to converting sunlight into electricity. To gain a boost in total system efficiency when using solar power, many engineers are switching to GaN FETs in their solar inverter designs.

There are three main steps where efficiency plays a major role when converting sunlight into usable electricity. The first and most obvious is the photovoltaic process itself. Overall panel efficiency can be influenced by many factors, including cell type and cell interconnection – with the most efficient solar panels available today using high purity monocrystalline N-type silicon heterojunction

interdigitated back contact or IBC cells (PV module efficiency of 20 to 22.6%). While this is vital for the overall efficiency, it is of course not an area where Nexperia's portfolio plays a role.

The other two steps, maximizing cell power output and DC/AC inversion, do lie within our areas of expertise. Given the power levels involved solar inverters have been dominated by high-voltage FETs and IGBTs (insulated-gate bipolar transistors). However, this is changing rapidly with the availability of wide bandgap semiconductors, and in particular 650 V GaN FETs. Not only do GaN FETs bring a significant improvement in overall conversion efficiency, effectively lowering the levelized cost of electricity (LCOE), they also make it easier to build smaller, lighter and more reliable inverters.

- Jeevitha J (19E121)

## *Electric ShoesX*

The world's first smart shoe ShoesX is launched with various features that one could only imagine in dreams. The shoe comes with a camera, USB port, and more. So, let's not waste much of our time talking and start with the specialty of these smart shoes, "ShoesX By Ixigo". USB Port (IP67 Rated) The first and most highlighted feature of the ShoesX by Ixigo is the USB IP67 Rated port. This USB port can be used to charge your mobile devices. All you have to do is carry the USB cable along with you. Ever felt that your phone is running out of battery. Plugin the cable and charge your device. Many people are confused about the IP 67 rating. Let us tell you that the rating given to the USB

ports indicates that the ports are resistant to air and dust particles. Not only dust, the IP 67 rated ports are also resistant to water. These world's first smart shoes will provide water resistivity up to 1 meter of depth into water. Also Read, 6 Amazing Summer Shoe Trends in 2021 That You Shouldn't Miss Auto Rechargeable Battery.

If the shoe provides you with a feature to charge your mobile devices, then the shoe must carry a battery in itself. Yes, it does carry a battery. Now, the question here is, how does this battery get recharged? Via Solar panel? The answer is no. The auto rechargeable battery in the ShoesX by Ixigo gets recharged via the kinetic



energy that the shoe acquires while walking. This reminds me of a great example. Remember the Black Panther's special suit that gets recharged when someone hits it. The underlying principle was Kinetic energy. We know that energy can neither be nor be destroyed. It can only be transferred from one form to another. So, Ixigo used the technology to convert Kinetic energy into electric energy. Store it on the battery and then use it to charge the mobile phones. Back Camera Moving to the next center of attraction towards these smart shoes is their camera. The shoes come with a Back camera. Ever felt that you need four eyes, two to look in front and the other to look backward. If yes, then the ShoesX by Ixigo will help you live the dream. The back camera will project the live scenario on the phone. Next time you feel someone is following you. There is no need to look back. Open your mobile, and watch him live on the screen (Front Selfie Camera).

These special shoes by Ixigo also come with a front camera, not only the back camera. This camera can be used to click selfies. If you feel your hands are not long enough to click a selfie, extend your legs and click. QR Code Scanner The front camera is not only for clicking selfies. You can also use the front camera to scan the QR code and make necessary payments. Anti-Theft Sensor

Well, shoes are a small entity that is easy to get stolen. But, you don't need to worry about it with the ShoesX by Ixigo as it comes with an anti-theft sensor. If the sensor notices an unusual move, it sends a notification to the owner's phone. Find My Shoe The sensor also provides you with an option to track your stolen shoes. The company is launching an application with the "Find My Shoe" option. Click on it, and the application will display the area where the shoes are. So, if your smart shoes ever get stolen, there is no need to worry. Open the application and start tracking your device. Auto Warming Sole

Finally, a shoe that has an inbuilt heater to warm the feet. The company has tested this feature at -20 degrees. So, if you want to go tracking on Mt. Everest, I think these ShoesX By Ixigo would be the perfect choice for you. Native Tracking App The company is also launching a native tracking application. This application will not only have the "Find My Shoe" feature but also track the calories burnt in the exercise, your BPM, and the steps taken. In short, this world's first smart shoe will replace your smartwatch.

- *Kanagasabapathy*  
(19E122)

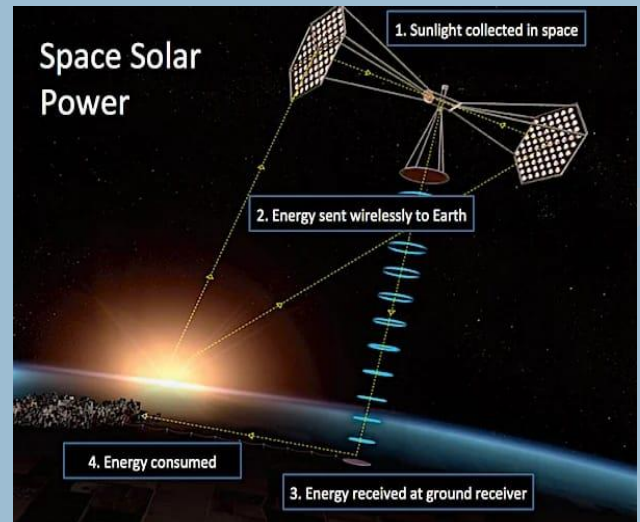
## *Transmitting solar power wirelessly from space*

The Japanese Space Agency (JAXA)'s Space Solar Power Systems (SSPS) aims at transmitting energy from orbiting solar panels by 2030. On 12 March, Mitsubishi Heavy Industries Ltd (MHI) successfully conducted a ground demonstration test of "wireless

power transmission", a technology that will serve as the basis for the SSPS. In the test, 10kW of electricity was successfully transmitted via a microwave unit. Power reception was confirmed at a receiver located 500 metres away. LED lights on the receiver confirmed

the transmission. This marks a new milestone in transmission distance and power load (enough to power a set of conventional kitchen appliances). Potentially, a solar battery in orbit (36,000km above earth) could generate power that would then be transmitted to earth via microwave/laser, without relying on cables. JAXA anticipates that this new technology could become a mainstay energy source that will simultaneously solve both environmental and energy issues on earth. The estimated lifecycle carbon dioxide emission for the operational SSPS indicates that it is almost the same as from nuclear power system and much less than fossil fuel power system,

JAXA claims on its website. Countries such as India, China and Japan are investing heavily in these technologies right now.



- Jagadeeshwaran S (19E117)

## ***Flying Wind Turbines' 'High' Energy Potential***

An airborne wind turbine is a design concept for a wind turbine with a rotor supported in the air without a tower, thus benefiting from the higher velocity and persistence of wind at high altitudes, while avoiding the expense of tower construction, or the need for slip rings or yaw mechanism. An electrical generator may be on the ground or airborne. Challenges include safely suspending and maintaining turbines hundreds of meters off the ground in high winds and storms, transferring the harvested and/or generated power back to earth, and interference with aviation.

### **Kiwee One: an airborne wind turbine**

Airborne wind turbines may operate in low or high altitudes; they are part of a wider class of Airborne Wind Energy Systems (AWES) addressed by high-altitude wind power and crosswind kite power. When the generator is on the ground,[4] then the

tethered aircraft need not carry the generator mass or have a conductive tether. When the generator is aloft, then a conductive tether would be used to transmit energy to the ground or used aloft or beamed to receivers using microwave or laser. Kites and helicopters come down when there is insufficient wind; kytoons and blimps may resolve the matter with other disadvantages. Also, bad weather such as lightning or thunderstorms, could temporarily



suspend use of the machines, probably requiring

them to be brought back down to the ground and covered. Some schemes require a long power cable and, if the turbine is high enough, a prohibited airspace zone. As of 2022, few commercial airborne

wind turbines are in regular operation.

- *Vasanth M (19E136)*

## *Transparent Solar wind*

Transparent solar panel is essentially a counterintuitive idea because solar cells must absorb sunlight (photons) and convert them into power (electrons). When a solar glass is transparent, the sunlight will pass through the medium and defeat the purpose of utilizing sunlight. However, this new solar panel technology is changing the way solar cells absorb light. The cell selectively harnesses a portion of the solar spectrum that is invisible to the naked eye, while allowing the normal visible light to pass through. To achieve this technological wonder, the researchers have developed the transparent luminescent solar concentrator (TLSC) rather than trying to do the impossible by creating a transparent photovoltaic glass cell. Solar panel blinds are cleverly combining these two divergent functions. An innovative startup called Solar Gaps has introduced solar panel blinds, which it claims can cut down energy costs by up to 70 percent. For every 10 sq. ft. of window space, these solar

window blinds can generate 100 watts of power (you could roughly power three laptops with this much electricity). These solar blinds can be installed either inside or outside, and you can control their angle and positioning using an app that will also inform you of



the energy generation figures. It includes a setting to automatically optimize the angle of the blinds according to the position of the sun.

- *Vikram S (19E137)*

## *What is Solar 3.0 and why is it important?*

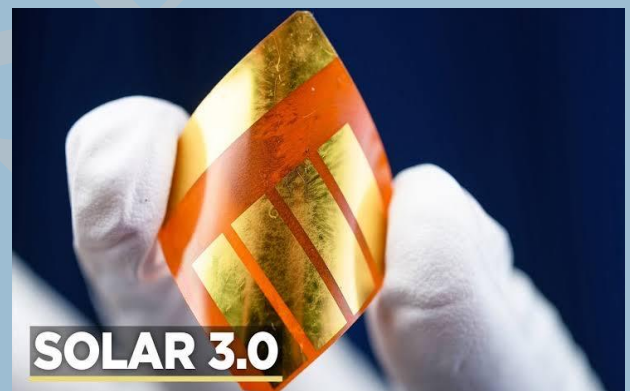
We as First Solar are thinking about the evolution of solar energy in three phases. Currently we see ourselves in the first stage what we call solar 1.0, which is defined by energy only contracts on the offtake side. We are just exporting energy into the grid, which has some challenges in matching between load and generation capacity and creates a debate about

solar. This energy only pumping into the grid is limiting the penetration of solar pv to about 15 to 20 per cent of the total generation capacity. So if we want to meet the European target and the global target and want to go to 100 percent renewables we should think of the next phase, solar 2.0, which is the pv power plant combined with advanced plant control. Here in

Europe, especially in Germany, several of the power plants are already controlled on a regular basis, but this is just curtailment – shutting the power plant down to maintain stability. So we are thinking about solar 2.0 and how the power plant can be strategically managed for the output and provide frequency control or other grid services to support the grid and provide higher value energy to the grid. These grid reliability services would provide significant value to grid operators and if this is fully understood and implemented with this advanced control we could go up to approximately 40 percent. That is the stage we are preparing and we are coming along with pretty soon. Solar energy 3.0 is a fully dispatchable solar pv power plant – we are talking about utility scale plants – using battery storage or another storage unit to allow time shifting, providing more or less energy to the grid as it is demanded. With this the industry Challenges in the market dynamics and economics around the world.

Here are challenges in the market dynamics and economics around the world. With the focus on auction processes, pricing is on a downturn, and that is really great, but ultimately, we as an industry still all need to be focusing on delivering a quality product. The industry is very innovative and resilient, and I see the 80 percent penetration for renewables is doable within the next 20-30 years. Between economics,

market and demand we need to be clear that we are all working in regulated market. Energy is basically regulated all over the world, we need to work closely with the grid operator etc. to archive the 80 per cent of solar penetration and 100 per cent of renewables in the next decades, the industry is definitively well positioned to do that cleverly and produce reliable and cost effective products should be able to support a pv penetration of up to 80 per cent. This is pretty similar to what the conventional generators are providing today. This is the basis for us to support our long term climate ambitions, the decarbonization of energy, mobility etc. We see ourselves as a kind of thought leader. Who is today, combining the segments of pv, storage and the political stake holders.



*-Abisiddhu M S (19E102)*

## *Wireless Wearable*

Last year, at the recent Apple event, Tim Cook shared a couple of videos he had received from several apple watch users. These customers appreciated how the apple watch had detected their health conditions (such as Atrial Fibrillation) and encouraged them to visit a doctor—ultimately saving their lives. Well, this is the same case with wearables in electrical engineering: they are literally all built with temperature sensing,

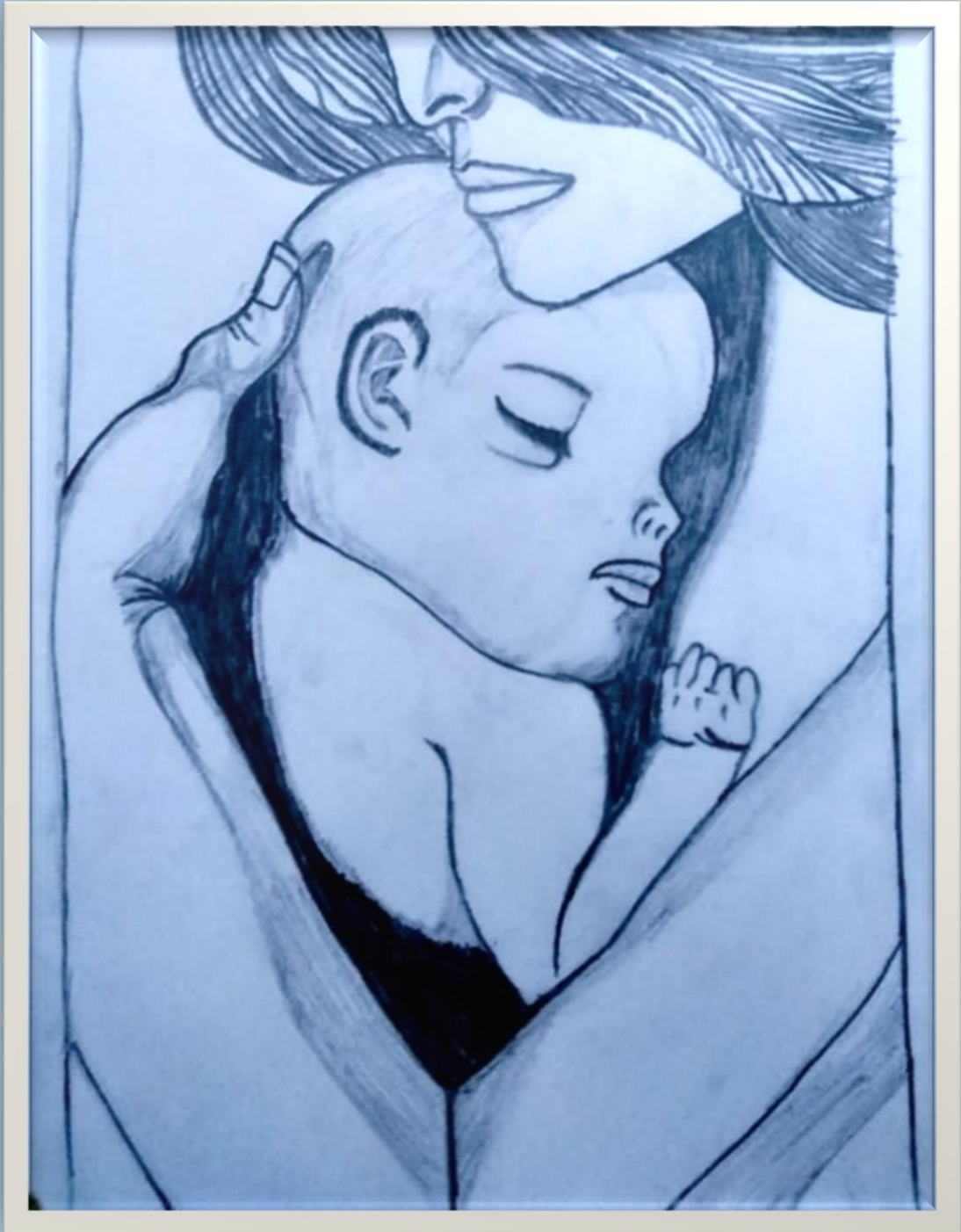
lighting, cloud connectivity, and GPS to provide a warning for overheating, proximity to danger, and falls. Furthermore, wearable devices are being developed to authenticate access to electrical machinery, provide communications information without the use of mobile phones. This significantly improves the overall safety of electrical engineers.

*-Jayaprakash.S (19E118)*



# *Drawing*

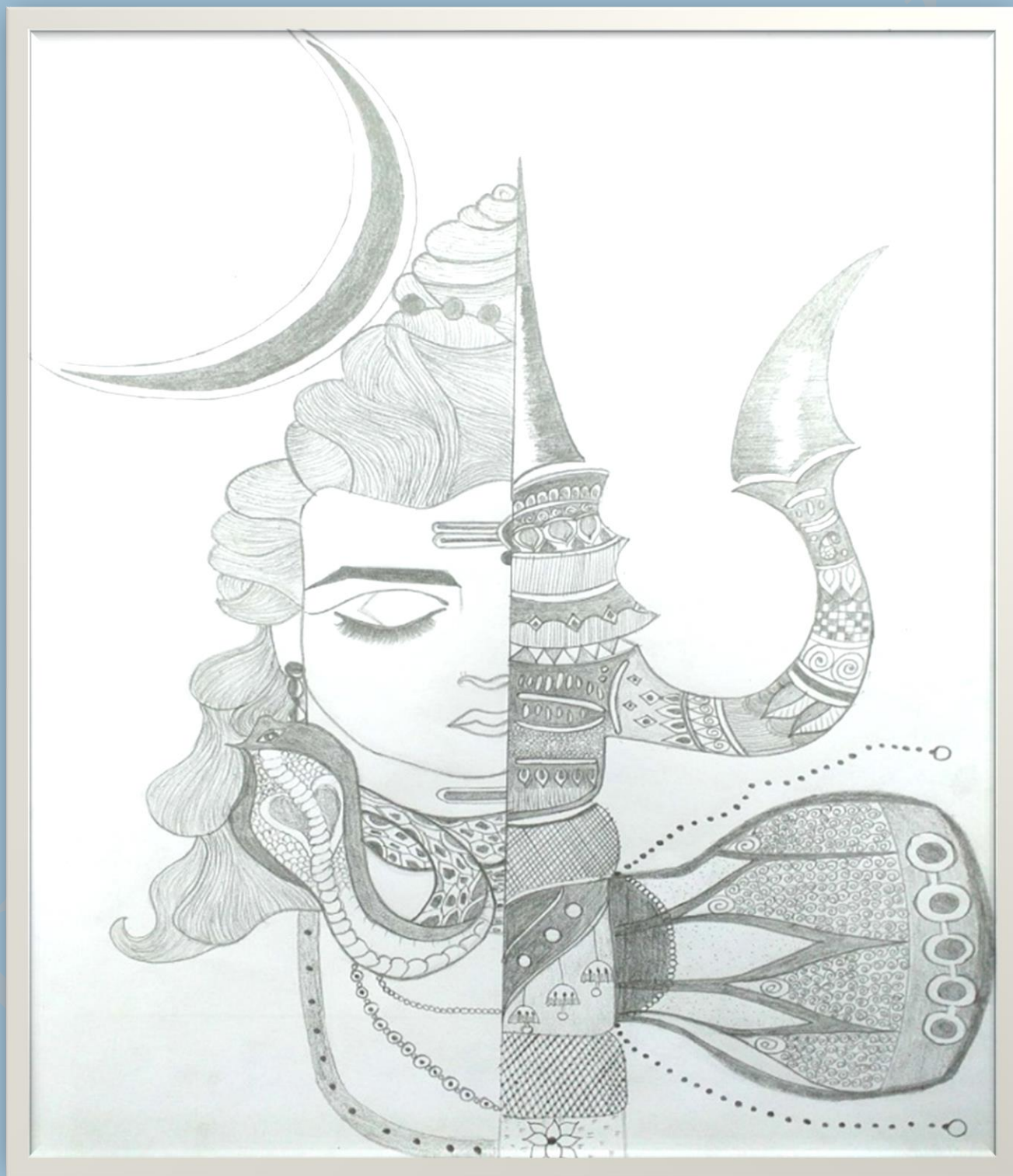
**KAVEYAN 18E213**



**KAVEYAN 18E213**

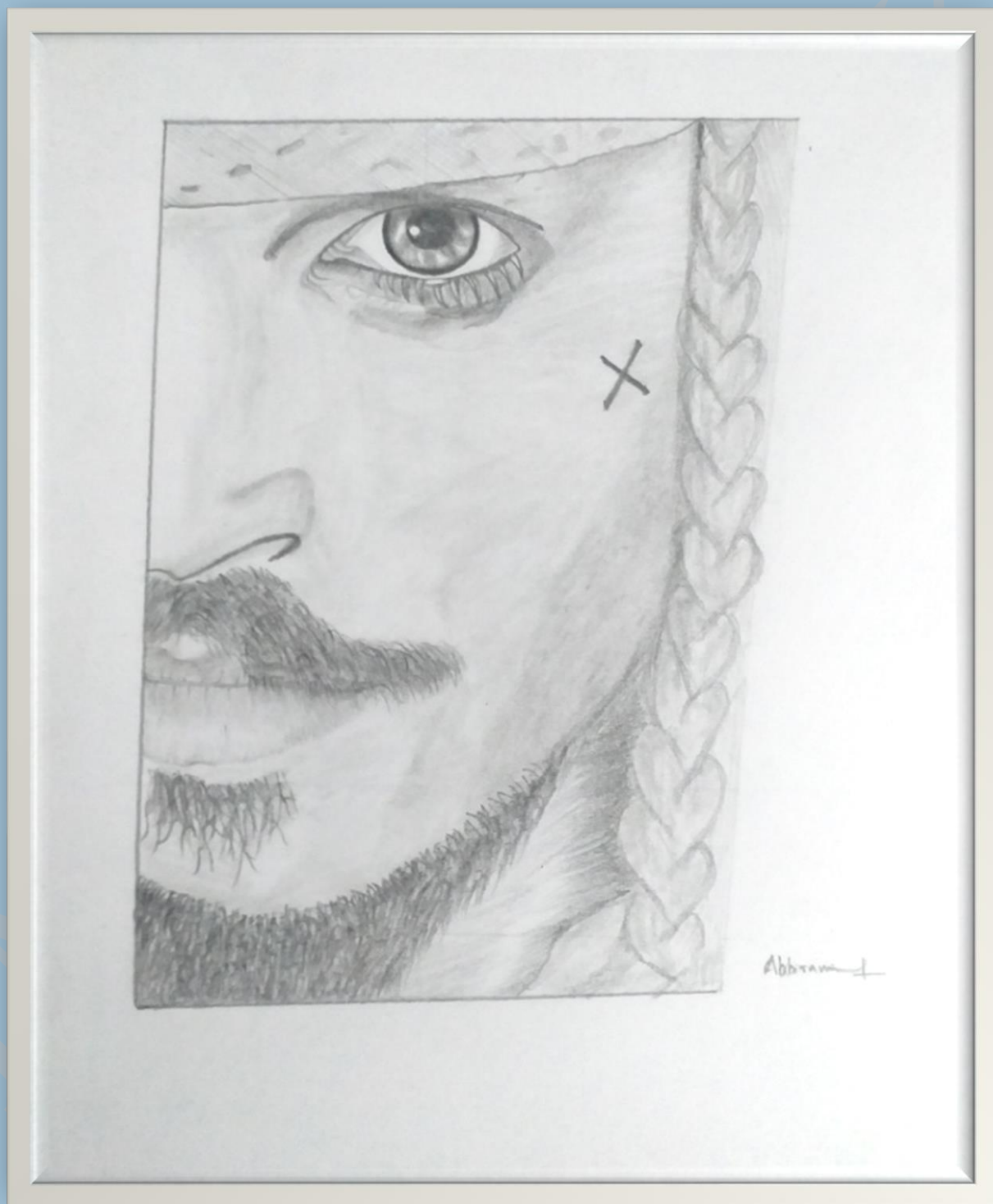


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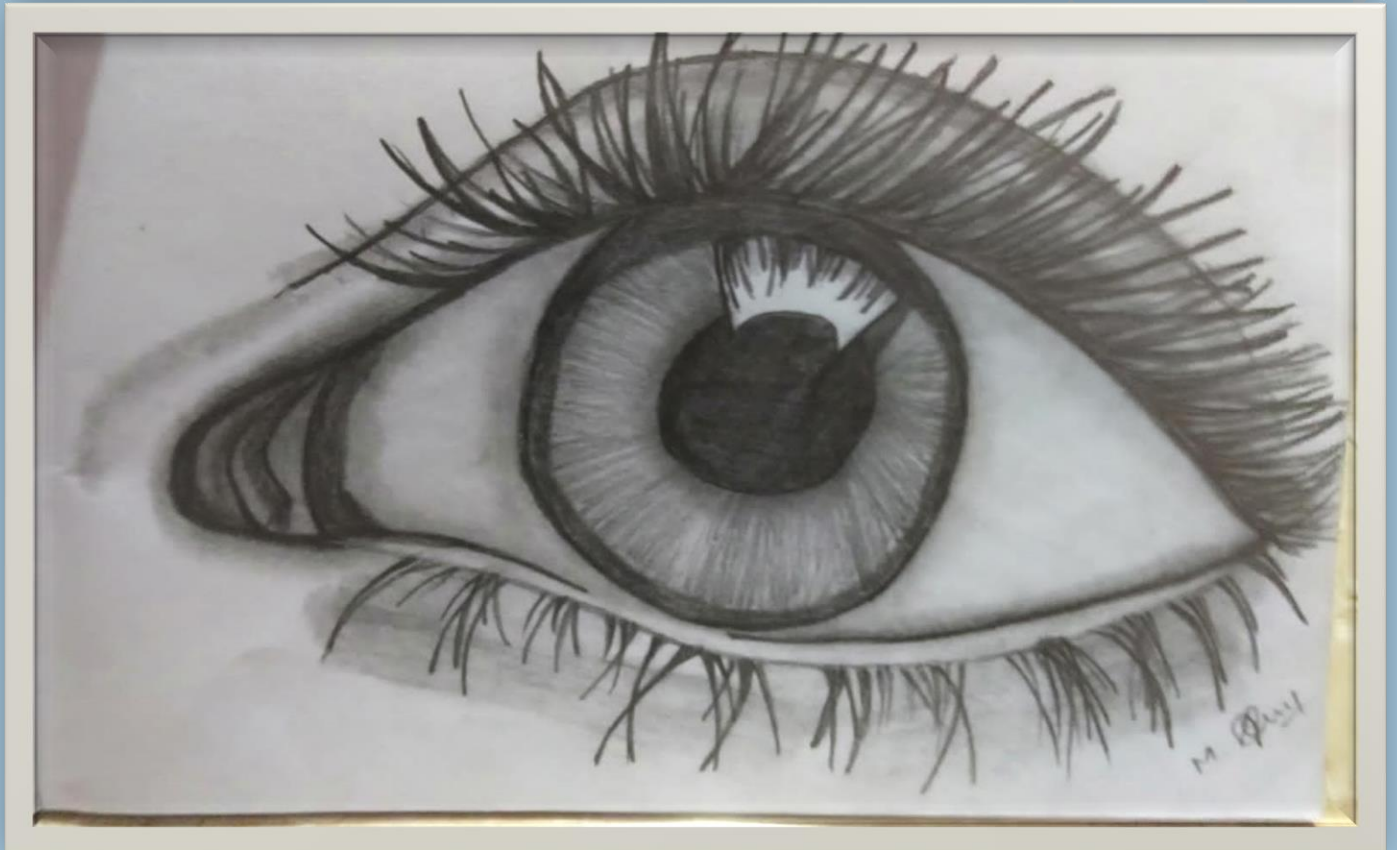




## Abirami A 18E102



**Suji M 18E237**



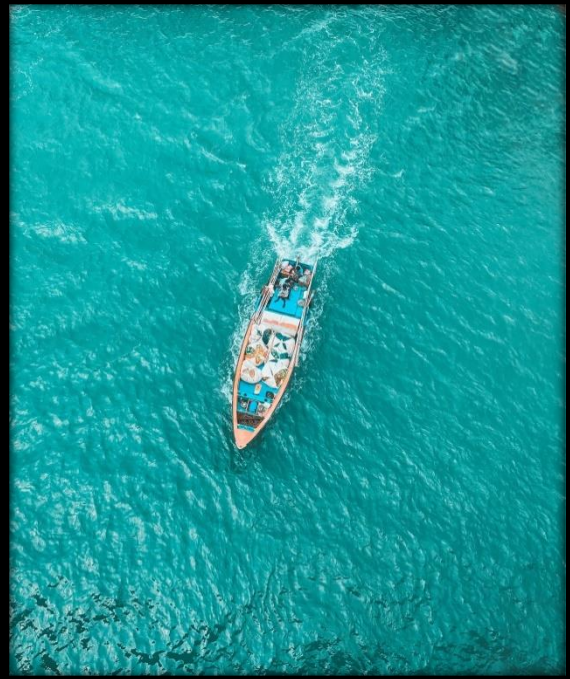
# *Photo gallery*

**CLICKS OF NAGAVIGNESH N 18E124**





## CLICKS OF ABISIDDHU M S (19E102)



# Poem

Ramkumar K 18E226

வழித்துணை நீயாக  
இருக்கையில்,  
போகும் தூரத்தில்  
சலிப்பில்லை,  
செல்லுமிடம் பற்றிய  
கவலையில்லை,  
முட்கள் வருடினாலும்  
வலியில்லை,  
எந்தன் காதலுக்கும்  
எல்லையில்லை!!!

- ராம்குமார் :)

**Meenakshi Sundaram 18E123**

**கருமலர் உன்னை, கருவிலிருந்து  
பூத்தவளை;**

**கருவிழியால் கண்டேன், கருங்கொடி  
ஏற;**

**கருநிலவு ஐயோடி, கண்டதென்ன  
மெய்யோடி!**

**- மீனாட்சி சுந்தரம்**

## *Did You Know?*

### *Did you know 3 US Presidents have won Grammys?*

Former President Jimmy Carter has won three Grammy Awards in the Best-Spoken Word Album category. The first one was for *Our Endangered Values: America's Moral Crisis* in 2007. Next came, *A Full Life: Reflections at Ninety* in 2016. Finally *Faith: A Journey For All* in 2019.

In 2004, Bill Clinton won Best Spoken Word Album for *My Life*. Just a year prior in 2003, he won the Best-Spoken Word Album for Children with Prokofiev: *Peter and The Wolf/Beintus: Wolf Tracks*.

Finally, Barack Obama has won a couple of golden megaphones of his own. He won Best Spoken Word Album in 2006 for the narration of his book, *Dreams from My Father* audiobook. In 2008, he took home another one when he took home the Grammy for Best Spoken Word Album for the audiobook version of *The Audacity of Hope*.

### *Did you know "strengths" is the longest word in the English language with one vowel?*

According to the Guinness Book of World Records, "strengths" is the longest word in the English language with one vowel. The word contains nine letters, eight of them being consonants.

### *Did you know there's a planet that's shaped like a potato?*

About the same size as Pluto, the dwarf planet Haumea orbits the sun beyond Neptune

and has rings that are similar to Jupiter. But what makes this object even more interesting is that it's shaped like a potato!

### *Did you know the Twitter bird has a name?*

It's Larry! The infamous bluebird of social media was named after former NBA player Larry Bird, who used to play for Twitter co-founder Biz Stone's home-state team, the Boston Celtics.

### *Did you know goosebumps are caused by a muscle?*

At the base of every hair follicle are tiny fan-shaped muscles called Arrector pili. These muscles contract when the body is cold in an effort to warm the body up and cause a person's hair to "stand up straight" on their skin aka goosebumps.

- Sriramkarthick S (19E133)



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*Thank You*