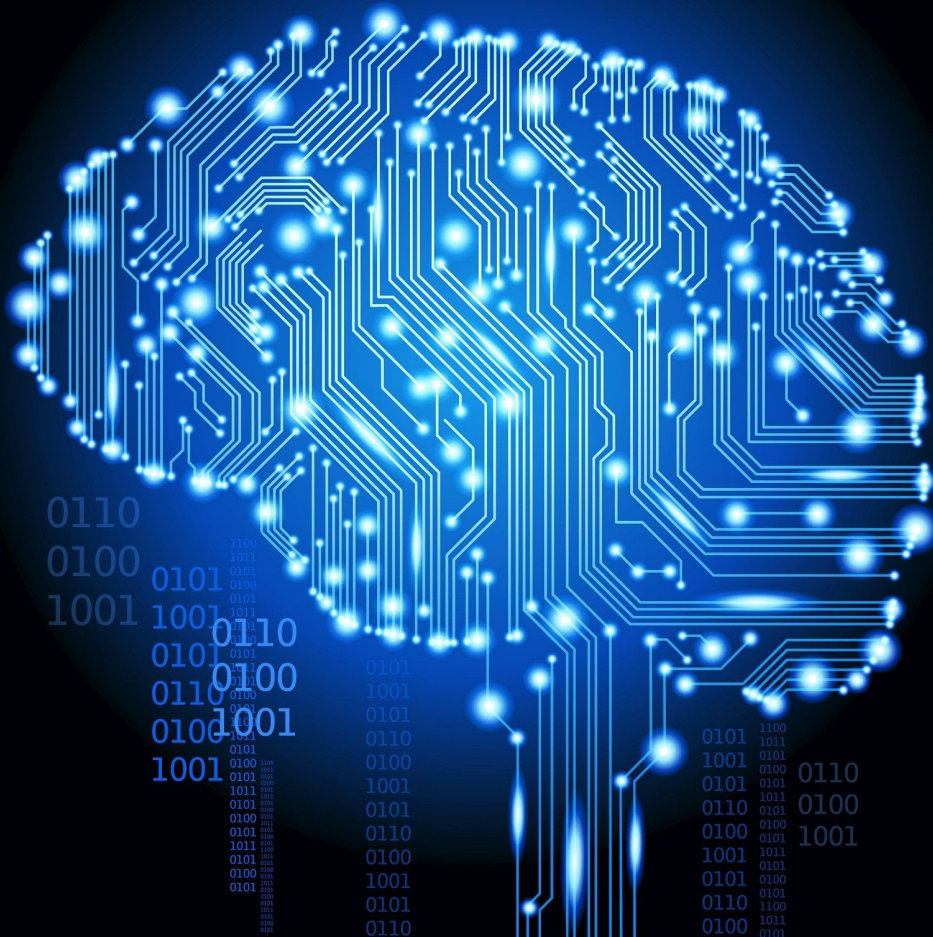


# ICERYX



Department of Instrumentation and  
Control Engineering

**SARANATHAN COLLEGE OF  
ENGINEERING**



**EDITORIAL**  
**SEPT-DEC 2020**



# FOREWARD

In this Pandemic Situation, our Education has changed to Online Platform. Walls of the Classroom are changed into Screens, ID card has changed into ID names, Notebooks has changed into Pdfs, Yet we never stopped learning. Before thanking the Internet and Social media, We need to thank our Staffs/Professors who has been a Greatest Support to students and the department. Thank You , Hope we recover soon from this.

## FROM THE EDITORS DESK

**Dear readers,**

It's our pleasure to provide you with interesting articles. From this edition, the magazine of ICERYX is getting its new form. Hope you would like to read it this way. Many new measures have been taken to bring in more fervent readers for our magazine. From the Public Relations team, we express gratitude to everyone who supported us in this endeavor. Stay tuned on to update yourself with the deeds of our department as well as the outside world. Happy reading!



# **PR TEAM MEMBERS**

## **1st YEARS**

**MUKESH.P  
VIGNESH.S  
SHERENE.G**

**SHARAN. R  
HARI VARSHINI.S**

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## **2nd YEARS**

**REGENA ARSHINI  
MOHAMED YAHYA  
BHARATH SAMUEL  
SHARLENE**

---

## **3rd YEARS**

**HARIHARAN.T  
VASUNDRA.R  
SHIVA SHANKAR.A**

**SURYA PRAKASH.D  
PRANAV KUMAR.S  
SWETHA.R**

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## **4th YEARS**

**MAHALAKSHMI.S.P  
SHARVIN SHAKESH.P  
AKASH SAMI. R  
SURYA.S**

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## ARTICLE

1. Wireless device makes clean fuel from sunlight, carbon dioxide and water.  
- MUKESH.P , 1st, ICE.

2. Un-hackable internet.  
- REGENA ARSHINI, 2nd yr, ICE.  
3. Researchers expose vulnerabilities of password managers.  
- SURYA PRAKASH.D, 3rd yr, ICE

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## FACULTY CORNER

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## APTITUDE

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Hariharan .T, 3rd yr, ICE

## ANALYTICAL REASONING

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Mohamed Yahya, 2nd yr, ICE

## DID YOU KNOW?

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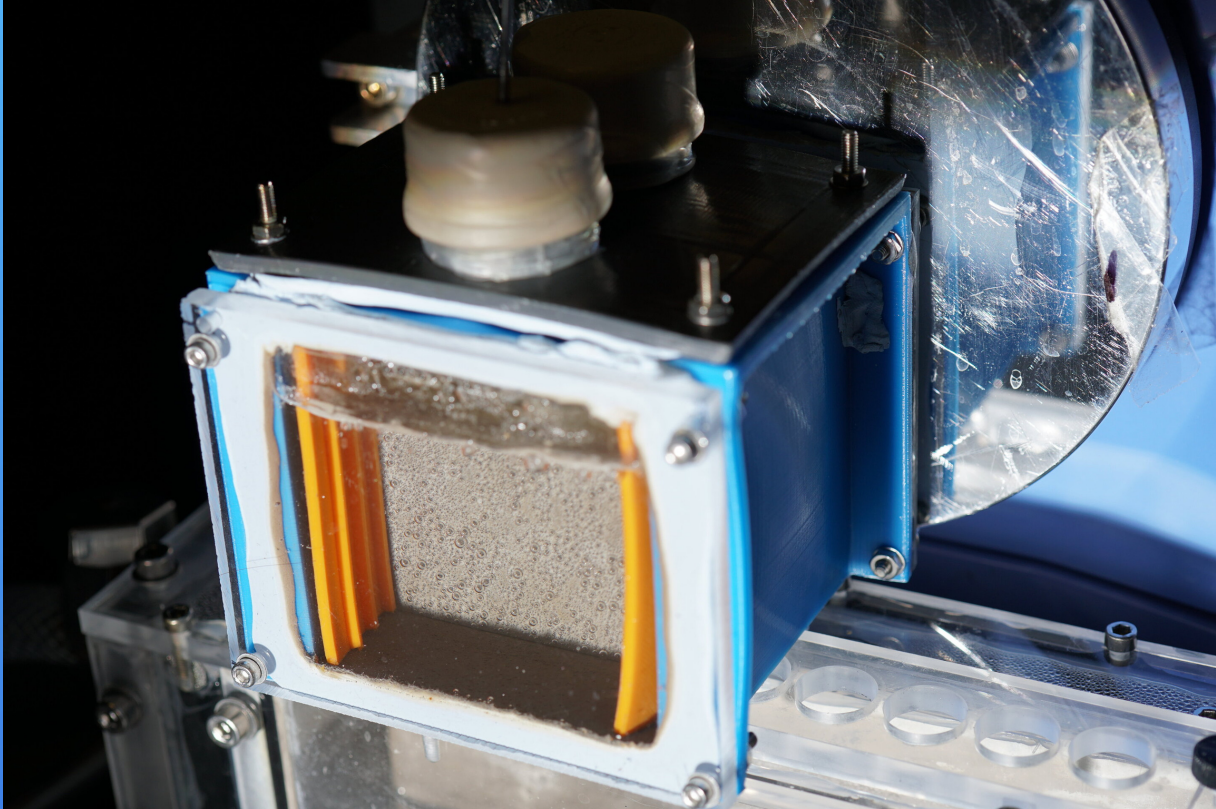
Sherene, 1st yr, ICE

## ART & PHOTOGRAPHY





# Wireless device makes clean fuel from sunlight, carbon dioxide and water



Researchers have developed a standalone device that converts sunlight, carbon dioxide and water into a carbon-neutral fuel, without requiring any additional components or electricity.

The device, developed by a team from the University of Cambridge, is a significant step toward achieving artificial photosynthesis—a process mimicking the ability of plants to convert sunlight into energy. It is based on an advanced 'photo sheet' technology and converts sunlight, carbon dioxide and water into oxygen and formic acid—a storable fuel that can be either be used directly or be converted into hydrogen.

- The results, reported in the journal Nature Energy, represent a new method for the conversion of carbon dioxide into clean fuels. The wireless device could be scaled up and used on energy 'farms' similar to solar farms, producing clean fuel using sunlight and water.

- Harvesting solar energy to convert carbon dioxide into fuel is a promising way to reduce carbon emissions and transition away from fossil fuels. However, it is challenging to produce these clean fuels without unwanted by-products.

- In 2019, researchers from Reisner's group developed a solar reactor based on an 'artificial leaf' design, which also uses sunlight, carbon dioxide and water to produce a fuel, known as syngas.



While the artificial leaf used components from solar cells, the new device doesn't require these components and relies solely on photocatalysts embedded on a sheet to produce a so-called photocatalyst sheet. The sheets are made up of semiconductor powders, which can be prepared in large quantities easily and cost-effectively.

In addition, this new technology is more robust and produces clean fuel that is easier to store and shows potential for producing fuel products at scale. The test unit is 20 square centimeters in size, but the researchers say that it should be relatively straightforward to scale it up to several square meters. In addition, the formic acid can be accumulated in solution, and be chemically converted into different types of fuel.

The carbon-dioxide converting cobalt-based catalyst is easy to make and relatively stable. While this technology will be easier to scale up than the artificial leaf, the efficiencies still need to be improved before any commercial deployment can be considered. The researchers are experimenting with a range of different catalysts to improve both stability and efficiency.

The current results were obtained in collaboration with the team of Professor Kazunari Domen from the University of Tokyo, a co-author of the study.

The researchers are now working to further optimize the system and improve efficiency. Additionally, they are exploring other catalysts for using on the device to get different solar fuels.







## Unhackable internet

An internet based on quantum physics will soon enable inherently secure communication. A team led by Stephanie Wehner, at Delft University of Technology, is building a network connecting four cities in the Netherlands entirely by means of quantum technology. Messages sent over this network will be unhackable.

In the last few years, scientists have learned to transmit pairs of photons across fiber-optic cables in a way that absolutely protects the information encoded in them. A team in China used a form of the technology to construct a 2,000-kilometer network backbone between Beijing and Shanghai—but that project relies partly on classical components that periodically break the quantum link before establishing a new one, introducing the risk of hacking.

The Delft network, in contrast, will be the first to transmit information between cities using quantum techniques from end to end.

The technology relies on a quantum behavior of atomic particles called entanglement. Entangled photons can't be covertly read without disrupting their content.

But entangled particles are difficult to create, and harder still to transmit over long distances. Wehner's team has demonstrated it can send them more than 1.5 kilometers (0.93 miles), and they are confident they can set up a quantum link between Delft and the Hague by around the end of this year. Ensuring an unbroken connection over greater distances will require quantum repeaters that extend the network.

Such repeaters are currently in design at Delft and elsewhere. The first should be completed in the next five to six years, says Wehner, with a global quantum network following by the end of the decade.



# Researchers expose vulnerabilities of password managers



Some commercial password managers may be vulnerable to cyber-attack by fake apps, new research suggests.

Security experts recommend using a complex, random and unique password for every online account, but remembering them all would be a challenging task. That's where password managers come in handy.

Encrypted vaults accessed by a single master password or PIN, they store and autofill credentials for the user and come highly recommended by the UK's National Cyber Security Centre.

However, researchers at the University of York have shown that some commercial password managers may not be a watertight way to ensure cyber security.

After creating a malicious app to impersonate a legitimate Google app, they were able to fool two out of five of the password managers they tested into giving away a password.

The research team found that some of the password managers used weak criteria for identifying an app and which username and password to suggest for autofill. This weakness allowed the researchers to impersonate a legitimate app simply by creating a rogue app with an identical name.

Senior author of the study, Dr. Siamak Shahandashti from the Department of Computer Science at the University of York, said: "Vulnerabilities in password managers provide opportunities for hackers to extract credentials, compromising commercial information or violating employee information. Because they are gatekeepers to a lot of sensitive information, rigorous security analysis of password managers is crucial.

"Our study shows that a phishing attack from a malicious app is highly feasible—if a victim is tricked into installing a malicious app it will be able to present itself as a legitimate option on the autofill prompt and have a high chance of success."

"In light of the vulnerabilities in some commercial password managers our study has exposed, we suggest they need to apply stricter matching criteria that is not merely based on an app's purported package name."

The researchers also discovered some password managers did not have a limit on the number of times a master PIN or password could be entered. This means that if hackers had access to an individual's device they could launch a "brute force" attack, guessing a four digit PIN in around 2.5 hours.

As well as these new vulnerabilities, the researchers also drew up a list of previously disclosed vulnerabilities identified in a previous study and tested whether they had been resolved.

They found that while the most serious of these issues had been fixed, many had not been addressed.

The researchers disclosed these vulnerabilities to the password managers.

Lead author of the study, Michael Carr, who carried out the research while studying for his MSc in Cyber Security at the Department of Computer Science, University of York, said: "New vulnerabilities were found through extensive testing and responsibly disclosed to the vendors. Some were fixed immediately while others were deemed low priority.

Revisiting Security Vulnerabilities in Commercial Password Managers will be presented at the 35th International Conference on ICT Systems Security and Privacy Protection (IFIP SEC 2020) in September, 2020.



# **FACULTY CORNER**

**Faculty of Department of  
Instrumentation and Control Engineering  
has certified in NPTEL course organized by IIT.**

S No.	Name	Course name	Course duration	Certification &Organized by
1	Dr P.Aravind	Chemical process control	8 Weeks	IIT bombay
2	P.Thirumurugan	Biomedical technology &nano	4weeks	IIT Roorkie
3	S.vigneshwaran	Power electronics	12 weeks	IIT Madras
4	T.Tamilarasan	Introduction to Smart Grid	8weeks	IIT
5	K.Ezhilarasi	Biomedical nanotechnology	4weeks	IIT Roorkie
6.	P.seetharaman	Automation in Manufacturing	8Weeks	IIT





# **FACULTY CORNER**

## **Dr. P Aravind, M.E., Ph.D**

1. "NPTEL" organized by IIT Bombay at Bombay from 14-09-2020 - 11-11-2020, Certified and ranked in top 14 among around 1000 candidates.
2. "Attended the webinar on Guidelines for Writing a Research Paper, Organised by Research Committee, Arasu Engineering College, Kumbakonam".

## **Mr. P Thirumurugan M.Tech.,**

1. "Resent trends in computational intelligence for healthcare monitoring systems-III" organized by BIT at Sathyamangalam from 14-12-2020 - 19-12-2020
2. "Cyber security in IoT enabled smart grid-online series-2" organized by EEE, TCE at Madurai from 14-12-2020 - 19-12-2020.

## **Mr. S Vigneshwaran M.E**

1. "Three day online FDP - Research proposal: writing and opportunities" organized by Goverment college of Technology at Webinar.
2. "Recent trends in power management statergies for optimal operation of distributed energy resources in micro grids" organized by Mahatma Gandhi Institute of Technology at webinar.

## **Mr. R Seetharaman M.Tech.,**

1. "Latest Innovative Techniques in Engineering" organized by Department of Instrumentation and Control Engineering at SARANATHAN COLLEGE OF ENGINEERING
2. "5 days Online Industrial Training Program on Artificial Intelligence" organized by AGIMUS Technology at Bangalore.

## **Ms. K Ezhilarasi M.Tech**

1. "Elearning Program-PLC"
2. "Elearning Program-Transformer"
3. "Elearning Program-software testing for beginners"

## **Mr. T Tamilarasan M.E**

1. "FDP on Research Opportunities, Challenges in Power Electronics for EV and Its Impact on Smart Grid" organized by NIT at Tiruchirappalli from 14-12-2020 - 20-12-2020.
2. "Workshop on Industrial Practices & Learning of State-of-Art LV and HV Switchgear" organized by Department of Electrical and Electronics Engineering, Switchgear Lab.



# APTITUDE

- The ratio of length to width of a rectangle sheet of paper is 5 : 3. If the width of the sheet is 18 cm, find its length?  
a. 90cm    b. 30cm    c. 54cm    d. 15cm
- If  $(a + b) : (a - b) = 15 : 1$ , then the value of  $a^2 - b^2$  is?  
a. 56    b. 15    c. 112    d. 8
- Rs. 3960 are divided among A, B and C so that half of A's part, one third of B's part and one sixth of C's part are equal. Then C's part is:  
a. 720    b. 810    c. 2160    d. 1080
- In a mixture of 120 litres, the ratio of milk and water is 2 : 1. If the ratio of milk and water is 1 : 2, then the amount of water required to be added is?  
a. 20    b. 40    c. 80    d. 120
- Ajay and Rohit who purchased the shares for the cost of their basic salaries which are in the ratio 5 : 6 later on the company gave them 40 additional shares salary to each, due to which the ratio changed to 7 : 8. If the worth of each share is Rs.75, what is the basic salary of the person who got less shares?  
a. Rs. 10500    c. Rs. 8500  
b. Rs. 7500    d. Rs. 9000
- One day in summer I wanted to chill me out, I went to a cool corner. I gave him a note of Rs. 10 and asked for a coke costing Rs. 5 per jar and he did so, but he returned me Rs. 5 in the denomination of Rs. 1, 50 paise and 25 paise. What would be the ratio of number of coins of each denomination respectively?  
a. 2 : 3 : 1    c. 6 : 1 : 3  
b. 1 : 7 : 2    d. 2 : 1 : 2
- Five numbers a, b, c, d and e are in the ratio 2 : 3 : 5 : 8 : 9 and their sum is 162. Find the average of all those numbers?  
a. 32.4    b. 30    c. 27    d. can't be determined
- Equal Quantities of three mixtures of milk and water are mixed in the ratio 1 : 2, 2 : 3 and 3 : 4. The ratio of water and milk in the mixture is?  
a. 193 : 122    c. 61 : 97  
b. 122 : 193    d. 137 : 178
- The ratio of ages of Rahul and Deepak is 3 : 5. 10 years later this ratio becomes 5 : 7. What is the present age of Deepak?  
a. 20    b. 50    c. 25    d. 40
- The ratio of Varun's age and his mother's age is 5 : 11. The difference of their ages is 18 years. The ratio of their ages after 5 years will be:  
a. 19 : 59    c. 37 : 75  
b. 2 : 3    d. 10 : 19
- Three bells in the Amarnath temple toll at the interval of 48, 72 and 108 second individually. If they have tolled all together at 6: 00 AM then at what time will they toll together after 6 : 00 AM and how many times these bells will toll together till the 6 : 00 PM on the same day?  
a. 6:07:12 AM, 101 times    c. 6:08AM, 101  
b. 6:09:11 AM, 100 times    d. 6:07:12AM, 100
- The least possible number of 3 digits when successively divided by 2, 5, 4, 3 gives respective remainders of 1, 1, 3, 1 is?  
a. 372    b. 275    c. 273    d. 193
- Find the HCF of  $(2^{315} - 1)$  and  $(2^{25} - 1)$  is?  
a. 5    b. 2    c. 31    d. none of these
- If  $n! = \frac{(n+4)!}{(n+1)!}$ , then the value of n is:  
a. 5    b. 18    c. 6    d. 9
- Number of zeros at the end of the following expression  $(5!)^{5!} + (10!)^{10!} + (50!)^{50!} + (100!)^{100!}$  is?  
a. 165    b. 120    c. 125    d. none of these



# Analytical Reasoning

**Directions:** Study the information given below to answer these questions:

- Eight persons – A, B, C, D, E, F, G and H are sitting around a circular table facing the centre with equal distances between each other (but not necessarily in the same order). Each one of them is also related to F in some way or the other.
- Only three persons sit between B and F. Only one person sits between F and H. F's father sits to immediate right of H.
- F's sister sits third to the right of F's father. Only one person sits between F's sister and F's son. E sits third to the left of F's son.
- Only three persons sit between E and F's husband. A sits second to the right of F's husband. F's mother sits to the immediate right of C. C is not the husband of F.
- F's daughter sits third to the right of H. D sits to the immediate left of F's brother.

1. Who amongst the following is the son of F?  
a. H                      c. D  
b. B                      d. C                      e. G
2. Who sits to the immediate left of H?  
a. B                      c. F's sister  
b. E                      d. F's husband                      e. A
3. How many persons sit between H and F, when counted from the left of F?  
a. 1                      c. 5  
b. 3                      d. 2                      e. None
4. How is B related to A?  
a. Grandmother      c. Grandson  
b. Son-in-law      d. Uncle                      e. Wife

**Directions:** Study the information given below to answer these questions:

Seven persons Paul, Queen, Rax, Sam, Tom, Unif and Vali are sitting in a row facing us.

Rax and Sam sit next to each other. There must be exactly four persons between Queen and Vali.

Sam sits to the immediate right of Queen.

1. If Paul and Tom are separated exactly by two persons, then who sits to the immediate left of Vali?  
a. Paul                      c. Unif  
b. Tom                      d. Rax
2. If Queen is not sitting at either extreme of the row, then who among the following has as many persons on his left as on his right?  
a. Sam                      c. Rax  
b. Unif                      d. Vali
3. If Queen sits at one extreme, then who is at the other extreme?  
a. Paul                      c. Vali  
b. Tom                      d. Cannot be determined
4. Tom sits to the right of Queen, and Paul is separated from Tom by exactly three persons. Then, who is sitting to the immediate left of Vali?  
a. Unif                      c. Tom  
b. Paul                      d. Rax

**Directions:** A cube is painted blue on all faces and is then cut in to 125 cubes of equal size. Answer the following questions based on this arrangement.

1. How many cubes are not painted on any face?  
a. 8                      c. 27  
b. 16                      d. 36                      e. 54
2. How many cubes are painted on one face only?  
a. 16                      c. 48  
b. 32                      d. 54                      e. 72
3. How many cubes are painted on 3 faces?  
a. 6                      c. 10  
b. 8                      d. 12                      e. 4
4. How many cubes are painted on two sides?  
a. 24                      c. 12  
b. 30                      d. 18                      e. 36





# DID YOU KNOW?

1. Over 6,000 new computer viruses are created and released every month. 90% of emails contain some form of malware!
2. The Firefox logo isn't a fox... it's a red panda!
3. Samsung is 38 years and 1 month older than Apple.
4. One Petabyte (PB) = 1024 (TB). To put this in perspective, a 50PB hard drive could hold the entire written works of mankind from the beginning of recorded history in all languages.
5. Alexa is always listening to your conversations. Alexa stores all of your dialogue history in the cloud to improve the Alexa experience.
6. On average, people read 10% slower from a screen than from paper.
7. The first computer mouse was made in 1964 by Doug Engelbart. It was rectangular and made from wood!
8. On average, there is only one reply per 12 million spam emails sent.
9. Surgeons that grew up playing video games more than three hours per week make 37% fewer errors and have a 42% faster completion rate when performing laparoscopic surgery and suturing.
10. NASA's internet speed is 91 GB per second.
11. Until 2010, carrier pigeons were faster than the internet.
12. In 1971, the first ever computer virus was developed. Named Creeper, it was made as an experiment just to see how it spread between computers. The virus simply displayed the message: "I'm the creeper, catch me if you can!"

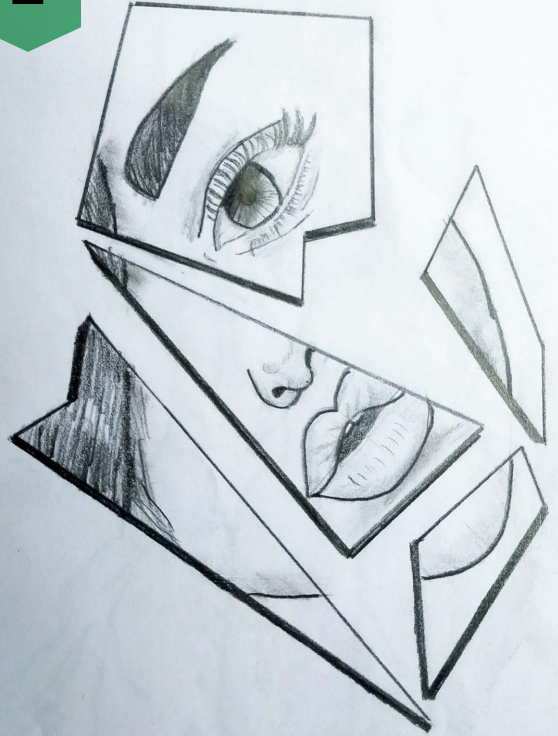


# ART & PHOTOGRAPHY

1



2



## ART

1. SWETHA .R ,3RD YEAR

2. VIGNESH .S,1ST YEAR

3. SHARLENE .A , 2ND YEAR

## DIGITAL PHOTOSHOP

4. KAVIN ,1ST YEAR

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3

