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# MECHZINE

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# GEETHANJALI

INSTITUTE OF SCIENCE AND TECHNOLOGY

**3rd Mile,Bombay Highway,Gangavaram(V),Kovur(Md),S.P.S.R Nellore(Dt)**

**www.gist.edu.in**

# Editorial Message

Hailed as the first draft of creativity and innovation, a magazine presents a social and tasteful conversation of a powerful organization, where the refined imaginative sensibilities and abilities of its young personalities go to the front. It holds mirror to the bunch exercises and activities embraced by the foundation to etch the multifaceted characters of adolescents besides being a media platform. On this earth shattering event of drawing out the magazine, we, the publication group, appreciatively recognize the unmistakable assortment of commitments made by the students and the staff.

"All progress comes beyond comfort zone"

# Editorial Board

# VISION-MISSION

## Vision

To evolve as a prospective learnig centre for producing quality human resourses.

## Mission

**$DM_1$:** Impart Technical knowledge through effective teaching-learning practices

**$DM_2$:** Provide congenial academic environment for honing technical skills

**$DM_3$:** Develop professional and entrepreneurial skills through collaborations

**$DM_4$:** Promote leadership skills along with social and ethical values

## PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

Graduates of B.Tech in Mechanical Engineering program shall able to

**PEO1:** Analyze Mechanical Engineering problems and provide sustainable solutions.

**PEO2:** Pursue successful professional career in industry, academia or research.

**PEO3:** Engage in continuous learning to keep abreast with emerging technologies with the sense of professional ethics.

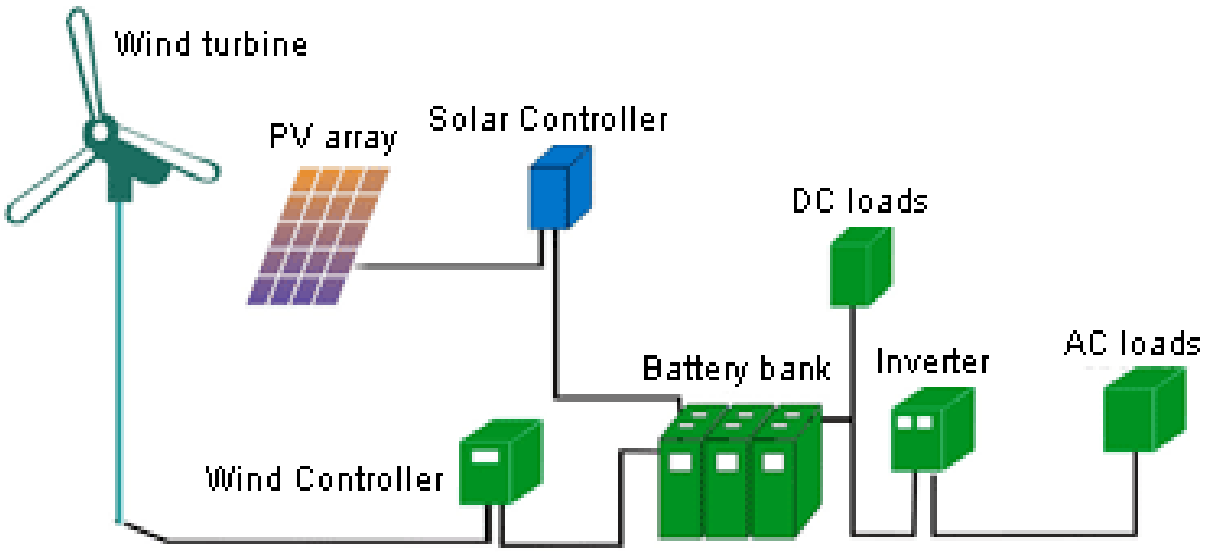
**PEO4:** Contribute in multi-disciplinary teams through effective inter personal skills.

# Small Wind Energy and Hybrid Systems Programme

## Introduction

The combination of renewable energy sources, wind & solar are used for generating power called as wind solar hybrid system. This system is designed using the solar panels and small wind turbines generators for generating electricity.

To better understand the working of solar wind hybrid system, we must know the working of solar energy system and wind energy system. Solar power system can be defined as the system that uses solar energy for power generation with solar panels. The block diagram of solar wind hybrid system is shown in the figure in which the solar panels and wind turbine are used for power generation.




Wind energy is also one of the renewable energy resources that can be used for generating electrical energy with wind turbines coupled with generators.

Wind turbine can be defined as a fan consisting of 2 or 3 blades that rotate due to blowing wind such that the axis of rotation must be aligned with the direction of blowing wind. A gear box is used for converting energy from one device to another device using mechanical method; hence it is termed as a high-precision mechanical system. There are different types of wind turbines, but the frequently used wind turbines are horizontal axis turbines and vertical axis turbines.

Solar Power system consists of three major blocks namely solar panels, solar photovoltaic cells, and batteries for storing energy. The electrical energy (DC power) generated using solar panels can be stored in batteries or can be used for supplying DC loads or can be used for inverter to feed AC loads. Solar Energy is available only during the day time whereas wind energy is available through out the day depending upon the atmospheric conditions.

Wind and solar energy are complementary to each other, which makes the system to generate electricity almost throughout the year. The main components of the Wind Solar Hybrid System are wind aero generator and tower, solar photovoltaic panels, batteries, cables, charge controller and inverter. The Wind - Solar Hybrid System generates electricity that can be used for charging batteries and with the use of inverter we can run AC appliances. Wind aero-generator is installed on a tower having a minimum height of 18 mtrs. from the ground level. Because of the height, the aero-generator gets wind at higher speed and thereby generates more power.

**D. JAGADEESH(162U1A0309) , IV ME**

# ATMOSPHERIC WATER GENERATOR (AWG)

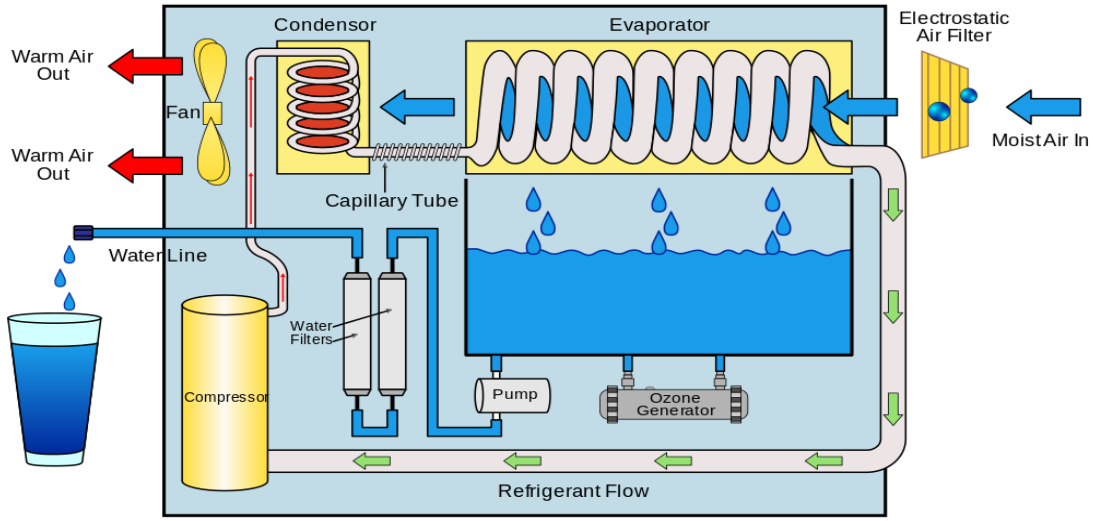
An **atmospheric water generator** (**AWG**) is a device that extracts water from humid ambient air. Water vapor in the air can be extracted by condensation - cooling the air below its dew point, exposing the air to desiccants, or pressurizing the air. Unlike a dehumidifier, an AWG is designed to render the water potable. AWGs are useful where pure drinking water is difficult or impossible to obtain, because there is almost always a small amount of water in the air that can be extracted. The two primary techniques in use are cooling and desiccants.

The extraction of atmospheric water may require a significant input of energy. Some AWG methods are completely passive, relying on natural temperature differences, and requiring no external energy source. Biomimicry studies have shown the beetle Stenocara gracilipes has the natural ability to perform this task.

Many atmospheric water generators operate in a manner very similar to that of a dehumidifier, air is moved over a cooled coil, causing water to condense. The rate of water production depends on the ambient temperature, humidity, the volume of air passing over the coil, and the machine's capacity to cool the coil. These systems decrease air temperature, which in turn reduces the air's capacity to carry water vapor. This is the most common technology in use, but when powered by coal-based electricity it has one of the worst carbon footprints of any water source (exceeding reverse osmosis seawater desalination by three orders of magnitude) and it demands more than four times as much water up the supply chain than it delivers to the user.

An alternative available technology uses liquid, or "wet" desiccants such as lithium chloride or lithium bromide to pull water from the air via hygroscopic processes. A proposed similar technique combines the use of solid desiccants, such as silica gel, Metal–organic framework and zeolite, with pressure condensation. Direct drinking quality water generating devices using sunlight is also under development.

It is said to take 310 Wh to make 1 liter of water.




**Cooling condensation**

In a cooling condensation type atmospheric water generator, a compressor circulates refrigerant through a condenser and then an evaporator coil which cools the air surrounding it. This lowers the air temperature to its dew point, causing water to condense. A controlled-speed fan pushes filtered air over the coil. The resulting water is then passed into a holding tank with a purification and filtration system to help keep the water pure and reduce the risk posed by viruses and bacteria which may be collected from the ambient air on the evaporator coil by the condensing water.

The rate at which water can be produced depends on relative humidity and ambient air temperature and the size of the compressor. Atmospheric water generators become more effective as relative humidity and air temperature increase. As a rule of thumb, cooling condensation atmospheric water generators do not work efficiently when the temperature falls below 18.3°C (65°F) or the relative humidity drops below 30%. This means they are relatively inefficient when located inside air-conditioned offices. The cost-effectiveness of an AWG depends on the capacity of the machine, local humidity and temperature conditions, and the cost to power the unit.

Recent efforts have been made attempting to utilize the Peltier effect of semiconducting materials in which one side of the semi-conducting material heats while the other side cools. In this application, the air is forced over the cooling fans on the side that cools which lowers the temperature of the air to its dew point, causing water to condense, the resulting water is then collected. Due to the solid-state nature of the semiconducting material, they are attractive for portable units although the low efficiency of condensing water at commonly experienced humidity is compounded by the high power consumption of Peltier coolers.

The drinking water generation capacity can be enhanced in low humidity ambient air conditions, first by using the evaporative cooler with a brackish water supply to increase the air humidity near to dew point condition. Thus drinking water is generated using brackish water without depending on ambient air humidity by the water generator.

**Wet desiccation**

One form of wet desiccant water generation involves the use of salt in a concentrated brine solution to absorb the ambient humidity. These systems then extract the water from the solution and purify it for consumption. A version of this technology was developed as portable devices that run on generators. Large versions, mounted on trailers, are said to produce up to 1,200 US gallons (4,500 l) of water per day, at a ratio of up to 5 gallons of water per gallon of fuel.[8] This technology was contracted for use by the US Army and the US Navy from Terralab and the Federal Emergency Management Agency (FEMA).

A variation of this technology has been developed to be more environmentally friendly, primarily through the use of passive solar energy and gravity. Brine is streamed down the outside of towers, where it absorbs water from the air. The brine then enters a chamber and is subjected to a partial vacuum and heated. The water vapor is condensed and the liquid water collected, while the renewed brine is recirculated through the system. As the condensed water is removed from the system using gravity, it creates a vacuum which lowers the boiling point of the brine.

Systems combining adsorption, refrigeration and condensation are also being developed

**In air conditioners**

In dehumidification type air conditioners, wastewater is a by-product, caused by air cooling and condensation, like an atmospheric water generator (AWG). The water, in this case, is not purified. Refrigeration air conditioning equipment usually reduces the absolute humidity of the air processed by the system. The relatively cold (below the dewpoint) evaporator coil condenses water vapor from the processed air, much like an ice-cold drink will condense water on the outside of a glass. Therefore, water vapor is removed from the cooled air and the relative humidity in the room is lowered. The water is usually sent to a drain or may simply drip onto the ground outdoors. The heat is rejected by the condenser which is located outside of the room to be cooled.

**In fuel cell car**

A hydrogen fuel cell car generates one liter of drinking quality water for every 8 miles (12.87 kilometers) ride which is of significance in desert conditions.

**V. RAKESH (182U1A0356) , II ME**

# WISE WORDS

**1**.

Imagination is very necessary part of your life,It
always leads to the edge of success,
But over imagination hurts your expectations,And it
leads to the edge of destruction,

Be satisfied with life. But, unsatisfied with The
results you produce. That's the best way
to keep growing and discover your hidden potential!Life is
in constant conflict between love ego.
love always wants to say sorry butEgo
always wants to hear it.!
Unbelievable fact our body is full of water but
Wherever it hurts, blood comes out.
Our heart is full of blood but whenever it hurts,tears
come out.
If you have a "Magnetic" personality andyet
people don't get attracted to you
it's not your fault. They have "Iron" deficiency intheir
bodies.

The best relationship is not the one that brings together
perfect people. But when each individual learns to live
with the imperfections ofothers and can admire the
other person's good qualities

**G. KIRAN(192U1A0304) , I ME**

**2.**

1. The average human life is relatively short.
2. You will only ever live the life you create for yourself.
3. Being busy does NOT mean being productive.
4. Some kind of failure always occurs before success.
5. Thinking and doing are two very different things. Success never comes to look for you while you waitaround thinking about it
6. You don't have to wait for an apology to forgive.
7. Some people are simply the wrong match for you.
8. It's not other people's job to love you; it's yours.
9. What you own is not who YOU are.
10. Everything changes, every second.

K. BHARGAV(182U1A0322) , II ME

# 1. My Trip in a Time Machine :

Wow! Yeah! Yeah! I found time machine. I can't believe this. This is incredulous! I want to test whether it really works or I am dreaming! Hmm, I would like to go to the time when dinosaurs used to live on land but they must be herbivores! I want to know about different breeds of dinosaurs and I will observe their way of living and after that I will try to knowhow the dinosaurs species were extinct from the earth. I will return to my past place then after I will go the century, where the industrial revolution first took place and then I will meet the world renowed scientists, philosphists, doctors, mathematicians and the experiments that are done to prove their theories that made the world awe-struck and changed the shape of the world. I would like to visit the holy temples ,mosques ,churches ,Buddhist and jainist temples and how the great persons(god) give their spiritual speeches to enhance the reality to the people and I would like to meet the main persons who are responsible for war and made them realize how the people will suffer. It may be impossible to stop them but I will try. I would like to visit the most serene and beautiful natural place which have a beautiful flower garden and a small stream of water falls and the chirping of birds with a pleasant and fresh air.

I would like to go to my ancestors period and want to know how hard they struggled for the family and also want to know traditions and rituals of my own family. It's a prodigious and everlasting moment in my life. I would like to go to the future and want to know how the environment and technology has changed.By that I can save my present and future generations by informing the malice effects that we people going to face in future.

**My trip in a time machine**

Can definitely help to construct a barrier that can Change our earth's past and Future in a better way!!!

**P. THARUN KUMAR(172U1A0326), III ME**

# *Poems*

**Law Of Success**

There is no more dangerous person dangerous to himself and to others thanthe person who passes judgment pretending to know facts.

To love praise, but not worship it, and fearcondemnation but not go down under it,
is evidence of a well balanced personality.

The person who sows a single beautifulthought in the mind of another,
renders the world a greater service than that rendered by all the faultfinders combined. There is no lazy man. What may appear to bea lazy man is only an unfortunate person who has not found the work for which
he is best suited.

Congratulate yourself when you reach thatdegree of wisdom which prompts
you to see less of the weakness of others andmore of your own, for you will then be walking into the future of really great.

**G. TARUN TEJA (172U1A0309), III ME**

## Rising Heart

We'll shine like the Sun
We dream to touch the sky
to touch the sky
We'll gather drop by drop
and flow away with the sea
away with the seawe're here right now
but we want to be beyond now
Don’t think we Can't
were determined and obsessed tooSay it out loud
I've one life and a hundred desiresI will fulfil their one by one Nothing can stop us now
"The right is amazing" Happiness is miles away
My eyes looking for the light in the darkHope is what dwells in my heart
I'm not giving up- no matter what theWorld Says.

**M. PREM KUMAR(172U1A0318), III ME**

## A Poem For Mom

You are the sunlight in my day, You are the moon I see far away.You are the tree I lean upon,
You are the one that makes troubles be gone.You are the one who taught me life,
How not to fight, and what is right.

You are the words inside my song, You are my love, my life, my mom.You are the one who cares for me, You are the eyes that help me see.

You are the one who knows me best,
When it's time to have fun and time to rest. You are the one who has helped me to dream,You hear my heart and you hear my screams.Afraid of life but looking for love,
I'm blessed for God sent you from above.

You are my friend, my heart, and my soul.You are the greatest friend I know.

You are the words inside my song, You are my love, my life, my Mom

**N. KARTHIK (192U1A0311) , I ME**

# నా కోరిక

1. చ్చటి ఉనన ఈ ిపపంచానిన చూస్న నీ కళ్ళ కి నేనే ిపపంచం అవాా లని నా కోరిక

ముద్దుల మందులాగా మాట్లడే నీ పెదవులకి నా పేరే జపమాల అవాా లని నా కోరిక

కలమ షం లేకుండా ిపేమ్తో నిండిన నీ మ్నసుకి నేనే గండెచపుప ుడ అవాా లని నా కోరిక

2. నినున చూసిన క్షణమున మారాను ఓ శిలలా
తెలియ్దు నాకు ఎందుకు నా గండె ఎగిసిపడుతుందో ఓ అలలా !
నీతో ఉంటే విశ్ం అంతా అందంగా ఒక వింతలా
నా ిపేమ్ను ఒపుప కుంటే జీవితాంతం తోడు ఉంట్ల నీ నడలా !!

**N. NAGA PRASAD(182U1A0332) , II ME**

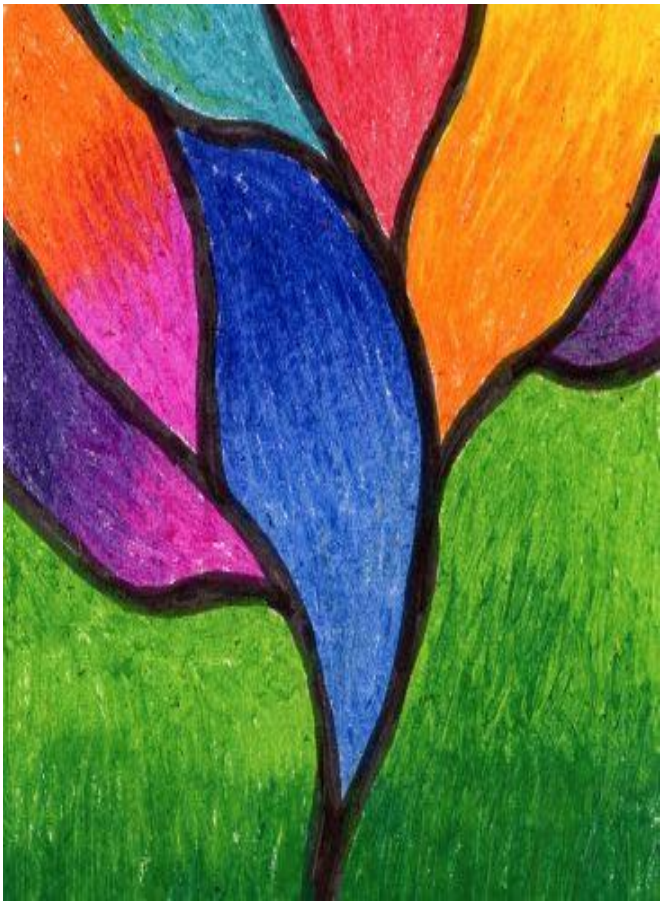
**SK. SHOUKATH(192U1A0324), I ME**

**G. UDAY KUMAR(182U1A0317),II ME**

**A. Yuvakumar(192U1A0301), I ME**

**K.VENKATESWARLU(172U1A0315), III ME**

D. PRAVEEN(182U1A0312) , II ME



B. PAVAN(172U1A0302) III ME

**D. SHIVA KARTHIK(182U1A0314) , II ME**

# *Stories*

## ORT STORY (Facing Adversities wisely)

A 12 years old girl, Asha entering into home very sadly. Her dad asked," baby, why are you so sad today?" then she replied-dad, I got very low marks in my favorite subject even I worked hard for these exams. Father says, "Don't worry! May be either your efforts were not sufficient or something happened wrong. Everything will be fine, you keeping working hard and honestly and one day you will get success" Then she convinced and smiled.

Another day she was playing with her friends outside of the house. She loses the game 4 times continuously then her friends were ridiculed her badly. She ran away from there and inform to her father. The he consoled her by saying "failure is stepping stone to success", do not worry baby. Then she smiled and played with her friends again with confidence and more concentration and she won the game.

After a week, she came to her dad and said that "dad, today I felt so sad because my friends were joking at my personal appearance" and she cried. Then father decided to teach a lesson to his daughter, which will make her strong to face these type of problems in her bright future. Father hold her hand and take her into the kitchen.

Asha's father placed an egg, a potato, and some tea leaves in three separate vessels with boiling water. He asked Asha to keep an eye on the vessels for ten minutes. Once these ten minutes were over, he asked Asha to peel the potato, peel the egg and strain the tealeaves. Asha was left puzzled.

Her father explained, „each of these items was but in the same circumstance of being in a pot of boiling water. See how they have responded differently. The potato is now soft, the egg is now hard, and the tea has changed the water itself. We are all like these items. When adversity calls, we respond in exactly the way they have. Now are you a potato, an egg or areyour tea leaves?"

**Moral of the Story:** We have to choose the solution for the problem and solve them wisely instead of losing hope.

**P. SPURGEON(172U1A0333), III ME**

## చెడు అలవాటు మొగ్గలోనే తుంచేయాలి

ఒక ధనికుడర తన పిలల వాడి చెడర అలవాట్ల ని చూసి చాలా విచారించాడర. ఒక వివేకమైన సలహాదార్ుడిని ఈ విష్యం కోసం నియమించాడర. ఆ పెదు మనిషి ఆ పిలల వాడిని తనతో విహారానికి తీసుకెళ్ల డీడర. అడవి దారిలో పిలల వాడికి చినన చినన మొకకొలు చూపి, వాట్టని పీకమ్మానడర. పిలాడర చాలా సులువుగా తీసనస్ాడర.

ఇంకా కొంత మర్ుందుకెళ్ల డీక, కొంచం పెరిగిన మొకకొలనిి చూపి, "పీకగలవా?" అనానడర. వెంట్నే, ఉతాసహంగా పీకి చూపించాడర. ఇంకా మర్ుందుకి వెళ్డీడిక, ఈ దనిి మొట్ి పెరికించగలవా? అనిి అడిగాడర. కొంచం కష్ిపడి అది కూడా ఎలాగ పెరికించాడర.

ఇంకా పెదు చెట్ు చూపి, దానిని పీకగలవా అని అడిగాడర. "నా వలల కాదనానడర." "చూస్ావా మ్ి? మ్న అలవాట్ు ఇలాగే పాతుకుపో యక్ాక పీకలేమర్ు. లేతగా ఉననపుపడే చెడడ అలవాట్ల ని వదిలలయర్ాలి. మంచి అలవాట్ల ని నాట్ుకోవాలి, పెంచుకోవాలి" అని ఉపదేశించాడర.

**నీతి:** చెడడ అలవాట్ల ని వదిలించుకోవట్ం కష్ిం. మొదట్ునే వాట్టని వదిలిపెట్ాలి.

**D. YASWANTH SAI(182U1A0315), II ME**

# AMAZING FACTS

1. The basic colours to eye are - red , yellow, blue.
2. The size of human eyes remain constant through out the life.
3. Squirrels forget where they hide their nuts.
4. The No.of dents on a golf ball are 336.
5. The longest word in English without vowel is Rhythm.
6. Euouae, a musical candence taken from the vowels is the longest English word spelled withoutany consonant.
7. The term "astronaut" comes from Greek words that mean "star" & "sailor".
8. The world's second largest English speaking country in India.
9. Humming bird's wings can beat 200 times a second.
10. A group of jelly fish is smack.
11. Corn is grown on every continent except Antarctica.
12. Hearing is the fastest human sense.
13. A cricket tournament, played as part of the 1900 summer Olympics.
14. India has the largest postal network in the world.
15. Shampoo was invented in India.
16. Rabindranath Tagore also wrote the national anthem for Bangladesh.

**P. THARUN KUMAR(172U1A0326), III ME**

# *RIDDLES AND SILLY QUESTIONS*

1. What has two heads, four eyes, six legs and a tail?

2. What is as big as a horse but doesn't weigh anything?

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

4. What did zero say to eight?

5. Do you know why birds fly to south in the winter?

6. Which letters do Tuesday, Thursday, Friday and Saturday have in common?

7. Which room has no doors, no windows?

8. What gets wetter as it dries?

9. Why are baseball stadiums so cool?

10. What do you call a fish without an eye?

11. What has thirteen hearts but no body and no soul?

12. What do you call a fish that only cares about himself?

13. Why couldn't Mozart find his teacher?

14. What's a minimum?

15. Why can't a bicycle stand on its own?

**S. YASH JAIN(162U1A0339) , IV ME**

## PROGRAM OUTCOMES (POs)

Engineering Graduates will be able to:

PO1. **Engineering Knowledge :** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem Analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7 **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8 **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9 **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10 **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions

PO11 **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12 **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

## PROGRAM SPECIFIC OUTCOMES

At the time of graduation student of B. Tech in Mechanical Engineering will be able to

**PSO1: Professional Skills:** Utilize the knowledge of materials and manufacturing principles to plan, design and monitor the production operations of an Industry.

**PSO2: Design Skills:** Employ the governing laws of thermodynamics, heat transfer and refrigeration & air-conditioning to design and develop thermo-fluid system.