

Equations & Emotions

(A Bi-annual Magazine of the Science and Literary Club, *The Quest*)

(B.A.College of Engineering & Technology, Jamshedpur)

(Vol.1, No.1, January-June,2020)



EQUATIONS & EMOTIONS

(A Bi-annual Magazine of the Science and Literary Club, The Quest)

(B.A.College of Engineering & Technology, Jamshedpur)

(Vol.1, No.1, January-June,2020)

Editorial Board

Dr. Dolly Chakroborty

Mr. Ratan Kumar Sharma

Mr. Debkumar Ray

Executive Editor

Dr. Ishita Ghosh



The Science and Literary Club, *The Quest*
BACET, Jamshedpur

EQUATIONS & EMOTIONS

(A Bi-annual Magazine of the Science and Literary Club of BACET, *The Quest*)

Advisory Board:

Dr. Shio Kumar Singh (Chairman, BoG, BACET)

Mr. Randhir Prasad Singh Director (I/c), BACET

Dr. Umesh Chandra Singh (Principal, BACET)

Published by:

B. A. College of Engineering & Technology (BACET), Jamshedpur

Administrative Assistance by:

Bimal Ojha/P. Ramdas/Mithilesh Kumar Shahi

Typesetting/Desinging & Printed at:

Tabrez Iqubal

Singhbhum Art Printers

The magazine is to be distributed among the Science & Literary Club Members of BACET, the contributing authors, the faculties, staff and students of BACET. Not for Sale.

Contact:

Department of Basic Sciences & Humanities,

B. A. College of Engineering & Technology (BACET), Jamshedpur

Email Id: hodbs@bacet.ac.in, thequest431@gmail.com

The editorship is honorary and the authors are solely responsible for their content.



MESSAGE

I am pleased to know that Basic Science & Humanities department of B. A. College of Engineering & Technology (BACET) is coming out with an inaugural volume of their Bi-Annual Club Magazine "Equations and Emotions" to be released on National Science Day this year.

As we all know that National Science Day is celebrated in India on 28 February each year to mark the discovery of the Raman Effect by Indian physicist Sir C. V. Raman on 28th February 1928. For his discovery, Sir C.V. Raman was awarded the Nobel Prize in Physics in 1930.

The main objectives of celebrating National Science Day every year are to

- widely spread a message about the Importance of science used in the daily life of the people
- display all the activities, efforts and achievements in the field of science for human welfare
- discuss all the issues and implement new technologies for the development in the field of science
- encourage the people as well as popularize the science and technology in the country.

As we know, most of the mathematics depend on equations, these are the main tool we have used to understand the world around us. In the same way, it would be difficult to think of any technological development done outside mathematics, which are used all the time to solve a variety of real-life problems.

Today's computer chips embedded in all the machines we use in daily routine, e.g., washers, dryers, cars, backs, etc., are based on mathematical equations and algorithms. Mathematical equations are also used in traffic control, aircraft, space program and medicine and so on. So we should always remember that any math equation result has the potential to change the world. That is the reason all mathematical equations are important in our life.

I congratulate faculties and students of Basic Science & Humanity department for bringing out this informative Bi-Annual magazine, which I am sure, will provide both qualitative and quantitative information to the readers.

Dr Shio Kumar Singh
Chairman Board of Governors (BOG)
BA College of Engineering & Technology (BACET)
Jamshedpur

Editorial

It's a moment of satisfaction and pleasure that finally it has seen the light of the day. It is a collection of thoughts, ideas, introspections, views, opinions, sentiments and beliefs. It is called "*EQUATIONS & EMOTIONS*"; the brainchild of "*The Quest*". The Science and Literary club has given highest priority to indulge the students society in a sensible and responsible thought process. Mankind has got the unique ability to think, reason, comprehend, analyse and judge the environment around it. Nature revolves around science, science revolves around mankind and mankind revolves around emotions. It is the responsibility of the educated minds to broaden the perspective and enlighten and enrich our beautiful planet.

Let us come forward to detoxify our mother nature and let her spread its calm, serene and enchanting tranquillity far and wide. Science with a perfect blend of equations and emotions can create the magic. The enthusiasm of science and the concern for nature need amalgamation for a greener globe and a broader smile. We need to comprehend each of the minor sensibilities and major responsibilities and execute them in unison with one and all to achieve the quest; the quest for a beautiful place to reside peacefully.

One of our best and trusted companion are surely books; the books whose presence can navigate us through anger, sorrow, joy, loneliness and hatred. They silently go down into our thoughts and help us to unravel the better version of oneself. It is an earnest hope that the readers and the contributors will enliven and communicate the urge for a safer and secure planet in general and "*Equations and Emotions*" in particular.

Dr. Ishita Ghosh

CONTENTS

Chairman's Message

Editorial

1. Cool-off !!... Enough of Global Warming
Mr. Randhir Prasad Singh
2. Books are here to stay.. Love the library of books
Dr. Umesh Chandra Singh
3. Toxic Effects of Heavy Metals in Plants –An Overview
Dr. Dolly Chakraborty
4. Fractional Derivative: An Introduction
Mr. Ratan Kumar Sharma
5. An Enduring Affair!!
Ms. Soma Ghosh
6. Library: An Information center
Ms. Kulwinder Kour
7. Life without friends
Mr. Deb KumarRay
8. On Literature: A Few Words
Dr. Manoj Kumar Pathak
9. जलधारा न बनें अश्रुधारा
डॉ ईशिता घोष
10. New Born Girl Wishes In This Kalyuga
Ms. Ruchi Kumari
11. Side effects of an invigilation duty!!
Dr. Ishita Ghosh
12. Science & Technology can improve lives of the specially-abled
Ritika Tiwary
13. Role of Engineering in Transforming Society and their Professional Responsibility
Abhisek Thakur
14. Waste Plastic-to-road Technology
Durgesh Sahu
15. A few interesting facts
Ritika Tiwary
16. कुछ विचार जिंदगी पर
17. Discoveries/Inventions at a glance
Ritika Tiwary
18. Some eminent scientists of India

EQUATIONS & EMOTIONS

Cool off! ... Enough of Global warming!!

Prof. Randhir Prasad Singh

(Director(I/c), B.A. College of Engineering and Technology, Jamshedpur)

An ideal human being is known to be fond of warmth in relationship from ages. But does he like a warmer globe as his habitat? Certainly not!! In spite of this, the globe is heating up to attain uncomfortable proportions. The lands and oceans are warming up around the globe and the temperature is continually ticking up. This phenomenon of temperature rise can be termed as global warming. Global warming is gauged by the increase in the average global temperature of the Earth. Along with our currently increasing average global temperature, some parts of the Earth may actually get colder while other parts get warmer—hence the idea of average global temperature.



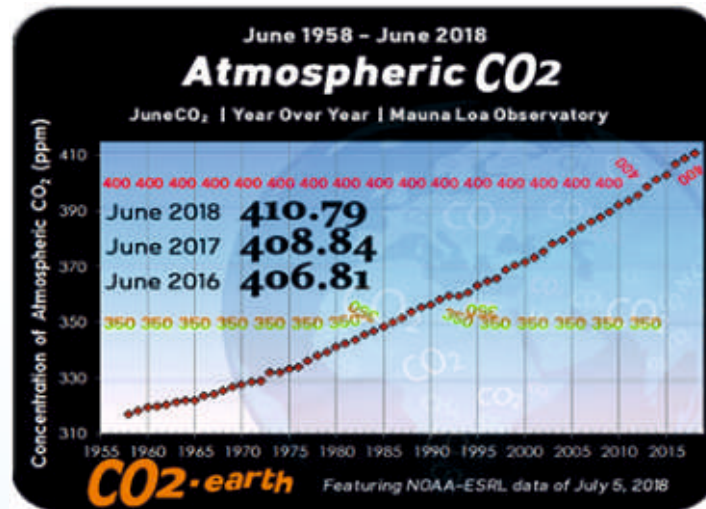
If you are someone who believes in figures, here is some food for your thought. According to the National Oceanic and Atmospheric Administration (NOAA), average surface temperatures rose a total of 1.71 degrees Fahrenheit (0.95 degrees Celsius) between 1880 and 2016. The pace of change has been an additional 0.13 degrees F (0.07 degrees C) per decade, with the land surface warming faster than the ocean surface — 0.18 degrees F (0.10 degrees C) versus 0.11 degrees F (0.06 degrees C) per decade, respectively.

The global warming and its reasons

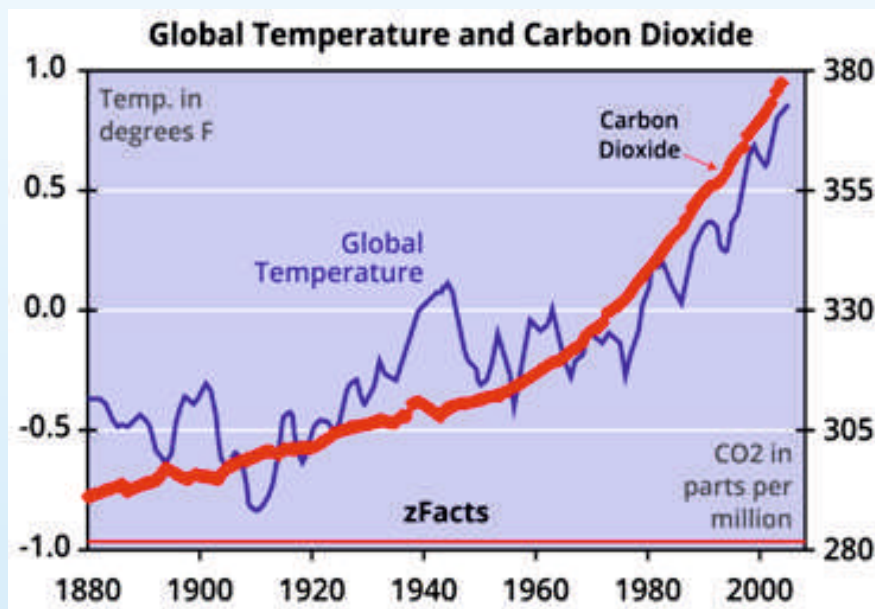
With this fact in hand, let us have a look on how we have managed to warm up the globe. Scientists are generally of the view that nearly all of global warming is caused by increasing concentrations of greenhouse gases (GHGs) and other human-caused emissions. Within the earth's atmosphere, accumulating greenhouse gases like water vapour, carbon dioxide, methane, nitrous oxide, and ozone are the gases that absorb and emit heat radiation. Increasing or decreasing amounts of greenhouse gases within the atmosphere act to either hold in or release more of the heat from the sun. Our atmosphere is getting warmer due to the heat-trapping greenhouse gases within the upper layers of our atmosphere. With the increase of carbon, methane, or other greenhouse gas levels in the atmosphere, our local weather and global climate is getting further agitated and disturbed. The concentration of the human-caused carbon pollution of our atmosphere has nearly doubled in 60 years—and it is continuing to escalate at faster and faster rates. Carbon in the atmosphere from fossil fuel burning isn't our only problem. A sample graph shows the escalating levels of CO₂ in the atmosphere in the past few years.

The future belongs to those who believe in the beauty of their dreams- Eleanor Roosevelt


EQUATIONS & EMOTIONS



The carbon content in the form of carbon dioxide has been rising in the atmosphere long before 1960. With the introduction of fossil fuels, it began rising at the beginning of the Industrial Revolution around 1880. The graph below shows the curve of carbon increasing in the atmosphere proceeds from about 1880 to 1950 in a gradual linear progression. From 1950 to 2000 and beyond, carbon increase in the atmosphere is a far steeper, more exponential curve.



Carbon dioxide is currently the most important greenhouse gas related to global warming. For a long time, our scientists believed that once in the atmosphere, carbon dioxide remains there for about 100 years. New research shows that is not true. 75% of that carbon will not disappear for centuries to thousands of years. The other 25% stays forever. We are creating a serious global warming crisis that will last far longer than we ever thought it as possible.



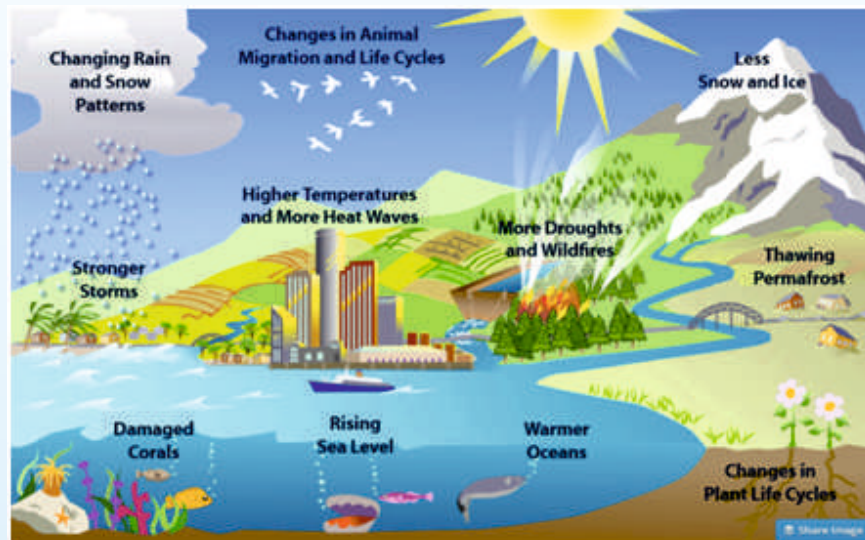
I have no special talent. I am only passionately curious—Albert Einstein

EQUATIONS & EMOTIONS

Effects of global warming:

Our global climate has held many different, relatively stable states over its 4.5-billion-year history. For hundreds of thousands of years, our planet's climate has moved within a fairly stable range of dynamic equilibrium, known as the cycle of Ice Ages. This is an alternating pattern of an Ice Age, followed by a period of receding ice.

Humanity has flourished since the last Ice Age because of the warmer, agriculture-friendly temperatures and lack of glacial ice cover. As our current global climate moves into a human-caused destabilization period, many rapid changes are occurring. These changes are characterized, by droughts, floods, wildfires, super-cyclones and the disturbance of previously established seasonal weather patterns. These changes are now also occurring with increasing unpredictability as well as with greater magnitude and frequency because of our continually escalating temperature.



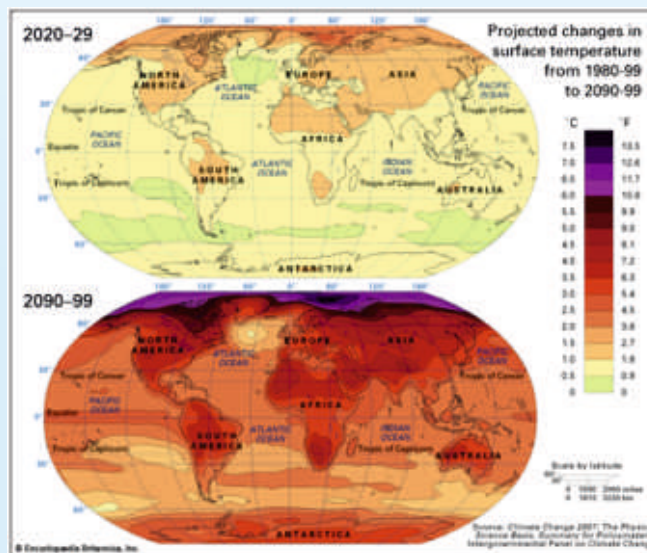
We are already experiencing major changes in rainfall and snowfall, with either too much or too little at one time. These transitional conditions will remain unstable or worsen until we have completed the transition to a new, more stable, climate temperature equilibrium and range. Greenhouse gas-caused atmospheric heating and agitation also increase the unpredictability of the weather and climate and dramatically increase the severity, scale, and frequency of storms, droughts, wildfires, and extreme temperatures.

Global warming can reach levels of irreversibility as it has now, and increasing levels of global warming can eventually reach an extinction level where humanity and all life on earth will end. Irreversible global warming can be defined as a continuum of increasing temperature that causes the global climate to rapidly change until those higher temperatures becomes irreversible on practical human time scales.

EQUATIONS & EMOTIONS

A few broader conclusions:

- On average, Earth will become warmer. Some regions may have warmer temperatures, while others may not.
- Warmer conditions will probably lead to more evaporation and precipitation on the average, but individual regions will vary, some becoming wetter and others drier.
- A stronger greenhouse effect will warm the oceans; partially melt glaciers and other ice and increase sea level. Ocean water also will expand if it warms, contributing further to sea level rise.
- Some crops and other plants may respond favourably to increased atmospheric CO₂, growing more vigorously and using water more efficiently. At the same time, higher temperatures and shifting climate patterns may change the areas where crops grow best and affect the makeup of natural plant communities.
- Today's global warming emergency is not a natural disaster. It is a human-made disaster.
- A small increase in average global temperature will eventually create catastrophic change in the world.
- If global warming and climate destabilization continue, our local and national weather, as well as our global climate, will become much more unpredictable. Storms, droughts, floods, sea level rise, and wildfires are going to become more severe, frequent, and occur at larger scales.
- As the global climate continues to destabilize, most people are not realizing that their lives are also destabilizing.
- A continually destabilizing climate due to escalating global warming will be the greatest disruptor of normal life even more than our greatest world wars.



I'm only responsible for what I say not for what you understand.

EQUATIONS & EMOTIONS

Books are here to stay.. Love the library of books

Dr. Umesh Chandra Singh

(Principal, B.A. College of Engineering & Technology, Jamshedpur)

Here are some points to ponder and understand the reasons to love books. e-books cannot win the race. e-books are just a replacement. They cannot create the nostalgia, passion or the obsession as the physical books can. So, love the books...live with the books...



- ✓ When the electricity is unavailable and the internet is down, books will still work for you.
- ✓ e-books are designed to distract you with links and “helps.” Books are designed for focus.
- ✓ You can physically feel your progress through a book as the upcoming pages get fewer and fewer. Not so with e-books.
- ✓ In reading a book you are dealing with a real thing and not just digital wind, so it feels like something to take more seriously, respect more, and value greater than an e-book.
- ✓ e-books are designed for speed with skimming, scrolling, and linking. But physical books are designed for slow processing, with larger pages, no links, and concentrated singular lines of thought. The effect is slowness and patience instead of frenetic haste.
- ✓ With real books, you can hold multiple places at once and flip back and forth between them in split seconds without losing your original place. Moreover, since the text never changes locations in a real book, it's easier to find your place in the book.
- ✓ Real books have a used-book market, which means you have access to tons of cheap books. This also leads to endless recycling of old books for new people and new shelves.
- ✓ Books aren't just for reading, they also decorate your walls and stands. Even as decoration, books breathe an air of intelligence into the room.
- ✓ e-books are hard on the eyes, at least when read from tablets, phones, or conventional computer screens. Regular books don't cause the eye-strain that e-books do. Even these are hard to read in direct sunlight. With regular books, that's not a problem.
- ✓ If you are in the thick of a research paper and you need to have five different books open at once, physical books afford that option. But your E-Reader or your phone does not. On a tablet or computer screen, you can keep separate “tabs” for different books, provided they are all on different sites. But the more tabs you have open, the slower your computer will run, and the more likely it will crash. Physical books will never crash.

The secret of getting ahead is getting started.--- Mark Twain

EQUATIONS & EMOTIONS

- ✓ Books have a feel to them, with texture, thickness, and weight. There's more interactivity with the physicality of the book than there is with an E-Reader. Many people find the “feel” of books more satisfying and nostalgic than with e-books.
- ✓ Related to the deep reading, the physicality of books invites a physical person-to-object relation, lending more “realness” to the characters and stories. The effect is that books enable emotional connectivity where e-books do not.
- ✓ Moving from a serious note to a trivial note, physical books are great storage for old letters, receipts, notes, lists, pressed flowers, leaves, or similar thin things. A well-worn book can be veritable storehouse of old memories.

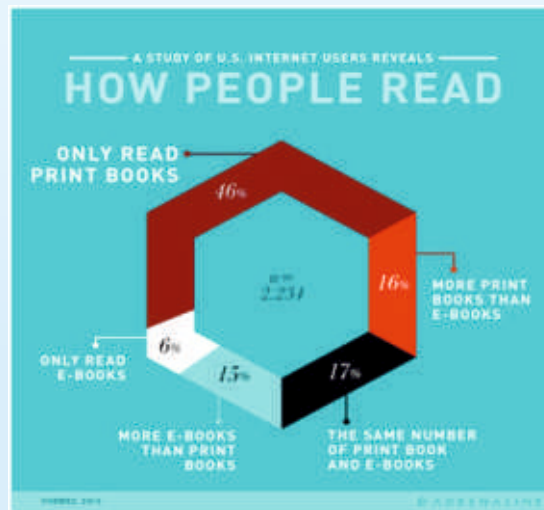


- ✓ Books keep the text stationary; the paragraph on page seven is always on page seven; it will not shift to page eight or page six when you turn your book sideways. Ebooks ruin this verbal stability by moving the text all around depending on the orientation of the phone, keyword searches, font-size, and which device you are reading it from.
- ✓ The stationary text is an advantage in its own right, but it has the added benefit of serving spatial memory. A great deal of our memory and comprehension in reading involves visual-spatial memory. We can find quotes, or remember lines, or retrace a course of thought on the basis of where those words were on the page.
- ✓ Books work just fine without batteries.
- ✓ Books don't need a charger, a plug, or an outlet.
- ✓ Books work fine without a WiFi password, and no one in a foreign country can hack your book and steal whatever you wrote in your book. They'd have to steal the book, and that's just not that likely.
- ✓ Most books aren't interesting to thieves!! You can leave your book at your table and go pick up your coffee from the counter, and no one will snatch it like they would with a laptop, tablet, or phone. Fancy electronics are a liability.
- ✓ Each book you read is a new physical experience while e-books are all just new ways to experience the same old cell-phone (or E-Reader, or tablet).
- ✓ You just cannot have a nice long reading session, with your ebook, from a lounge chair on a sunny beach.

The secret of change is to focus all of your energy, not on fighting the old, but on building the new.—Socrates.

EQUATIONS & EMOTIONS

- ✓ Books can be personalized in a way that e-books cannot. You can draw pictures, add book-covers, create flip-books in the bottom corner. You can't do this with ebook.
- ✓ You never really own an ebook. You are only renting them permanently. A digital library owns the book, doesn't charge late fees, and then reclaims it whenever you die (or whenever you forget the password on your device. With physical books, you have real genuine ownership to go along with your personalization.
- ✓ You will never have to download an update to your book. When you open it up, the text is there to read. It's not hidden behind some screen saying "Update Now or you'll never see your precious little story again."
- ✓ Almost everything digital cultivates short-attention spans and multi-tasking distraction. On the average E-Reader or ebook app on your phone, there are scroll-down lists, alerts, and call-outs which are designed to make you look at something else.
- ✓ Books are also low risk in other ways. What happens if you drop it on the street? With a physical book, you just pick it back up again. If you drop your costly gadget on the street, its just over!
- ✓ Rarely do people get addicted to physical books or rather this addiction is nice. Meanwhile, digital addiction is the most pervasive and growing epidemic of our day.
- ✓ Books are three dimensional physical objects with length, width, height, weight, texture, and smell. They carry information in a physical way, enabling you, the reader, to create a mental map of their stories and ideas. Our minds gravitate towards physical illustrations, mnemonic devices, and memory cues when we try to formulate a comprehensive understanding of something.
- ✓ It is related to mental mapping, the fact that book texts are stationary allows your memory to seize upon that object permanence and remember lines, ideas, names, and dates with great ease. They have a reliable physical location on a given page. That location will not change in the book.



- ✓ Readers are often hampered by touch-sensitive features. They are supposed to be convenient, but what if your hands are cold and shaky? Or the screen display is wonky and won't let you touch the corner you want to highlight? Or what if your fingers are too fat for the tiny little keys on the screen? Books won't give you a hard time.

EQUATIONS & EMOTIONS

- ✓ Physical books are exchangeable. You can gift them to friends. You can pass out copies of books you've read and don't want anymore. You can donate them to charity. e-books are stuck in your device and can't be recirculated into the community, the economy, or the rest of the world.
- ✓ Reading a good book on a porch swing, or on a train, or at a coffee shop or bookstore that's an iconic setting for meaningful human experience. It's a romantic/nostalgic scene to be engrossed in a book within the beauty of natural scenery. That iconic scene crumbles if you replace the book with some electronic device. Truly speaking, books help connect you to the natural world while e-books tether you to the artificial world.
- ✓ Books are artifacts, tangible human creations. Books are the stuff of archaeology, history, and anthropology. They are part of our physical culture. e-books carry information, and they are fine for what they are, but they aren't suited for museum displays. They aren't precious expensive artifacts of bygone civilizations. They aren't mementos of important times in our life, or childhood memories. Compared to books, e-books are ephemeral wind.
- ✓ The simplicity of books allow the reader to have a one-on-one conversation with the author. You can read what they are saying, write comments in the margins, take notes in the back, and reread important sections. But if books are like a one-on-one conversation, e-books are like a crowded noisy room where the whole experience is stuffed with distractions and cross-talk.
- ✓ Books have a lasting power unrivalled by anything in the digital age. We have books from thousands of years ago. And if we don't die in a nuclear holocaust, we'll have books for thousands more years. But, chances are, you probably have a iPod or E-Reader that's broken and useless. That thing is only a couple years old. And it probably has content that is forever lost unless you can repair it. Books have lasting power where e-books are unproven and possibly fleeting.



Do not get upset with people or situations, both are powerless without your reaction.

Toxic Effects of Heavy Metals in Plants – An Overview

Dr. Dolly Chakraborty

(Asst. Prof of Chemistry, BSH Dept, B.A.College of Engineering &Technology, Jamshedpur)

Vegetables and fruits are essential for a healthy diet and equally important is the quality of those fruits and vegetables which we consume. Food Safety is a global issue and in the past few years this has been under threat due to the contamination of agricultural products with heavy metals like Lead, Cadmium, Mercury, Arsenic etc. According to a recent report by Central Pollution Control Board, New Delhi, regarding heavy metal contamination in Yamuna River side agricultural lands in Delhi, contains high levels of Lead, Mercury, Cadmium and Arsenic, which has an adverse effect on human health. Diseases like Asthma, Cancer, Skin diseases are caused due to fruits and vegetables contaminated with these metals.

Sources

The main factors of soil contamination (with heavy metals) are :

1. Modern intensive agriculture (Phosphatic Fertilizers, Pesticides, etc.)
2. Energy intensive industries (Thermal Power Plant, Coal Mines, etc.)
3. Vehicular Pollution
4. Untreated Sewage
5. Industrial and Domestic wastes
6. Irrigation with untreated and contaminated waste water

Effects

Heavy metals are non – biodegradable and are readily accumulated in living organisms and displace the essential nutrients from their original locations.

Some heavy metals and their effects on human health are discussed below.

Lead

Lead is a naturally occurring toxic metal found in the earth crust. Its widespread use has resulted in extensive environmental hazards with significant public health problems in many parts of the world.

Young children are particularly vulnerable to the toxic effects of lead which retards the development of brain and also affect the function of nervous system. Lead causes long term harmful effects in adults including enhanced risk of high blood pressure and kidney damage.



EQUATIONS & EMOTIONS

Lead (from contaminated bone) is released into the blood stream during pregnancy and become a source of exposure to the developing foetus.

The main sources of lead contamination are:

1. Mining
2. Smelting (in metallurgical operations)
3. Manufacturing and Recycling processes
4. Leaded paints, gasoline and leaded aviation fuel
5. Automobile emissions
6. Combustion of Coal
7. Construction activities
8. Chemicals used in fertilizers

Arsenic

In plants arsenic is absorbed by roots, transported to shoots through xylem and reaches the aerial parts of the plants including the seeds.

Arsenic is introduced into the environment from various sources, mainly categorized as Geological and Anthropogenic (human activities) sources. In addition, small amount of arsenic also enter the soil and water through various biological sources that are rich in arsenic. Anthropogenic sources of arsenic contamination are the predominant sources of arsenic contamination in industrialized countries. Arsenic containing pesticides and herbicides release arsenic into and water. The chemical compounds which are released in soil through pesticides are mainly calcium arsenate, magnesium arsenate, zinc arsenate, zinc arsenite and lead arsenate.

The main sources of arsenic contamination are:

1. Mining
2. Metal smelting
3. Combustion of fossil fuels
4. Use of agricultural pesticide

The toxic effect of arsenic is responsible for diabetes, peripheral neuropathy,

Mercury

Mercury toxicity has become a problem of current interest as a result of environmental pollution on a global scale. Considerable amount of mercury is added to agricultural land with sludge, fertilizers, lime and manures. The most important source of soil contamination is organic mercurials as seed coating to prevent fungal diseases in plants.

Potential sources of mercury contamination are :

1. Mining
2. Dental amalgams
3. Incineration of coal
4. Alkali and Metal processing
5. Medical and Municipal wastes

EQUATIONS & EMOTIONS

Like lead, organic forms of mercury can also cross the placenta which results in abnormalities and cerebral palsy in new born babies. Tremors, gingivitis and psychological changes are some of the problems linked with mercury contamination in crops.

Cadmium

Cadmium is a nonessential element that negatively affect the growth and development of plants.

Sources of cadmium are :

1. Power Stations
2. Heating systems
3. Metal processing industries
4. Vehicular traffic
5. Domestic waste water
6. Industrial discharges

It is recognized as an extremely significant pollutant due to its high toxicity and large solubility in water.

In plants, cadmium is absorbed by the root and then pass through the stem to leaves, fruits and seeds. Vegetables grown in cadmium contaminated soil become a significant exposure rout for those consuming these vegetables.

Cadmium toxicity for prolonged period may cause chronic obstructive pulmonary disease, renal tubular disease, renal dysfunction, Pulmonary (lung) and gastro-intestinal problems have also been reported.

Preventive Measures

The United Nation Environment Assembly (UNEA) along with World Health Organisation (WHO) and Food and Agricultural Organisation (FAO) have taken a serious step to reduce soil pollution.

One of the best solutions in this regard is recycling the garbage produced particularly in the urban areas.

Another useful preventive measure is biodegradation, which will reduce soil contamination to a considerable extent. Similarly biorefinery process is also an important step for controlling plant toxicity. Both the processes are cost effective and eco friendly.

Proper selection of crop and crop rotation are also effective in preventing soil / plant toxicity.

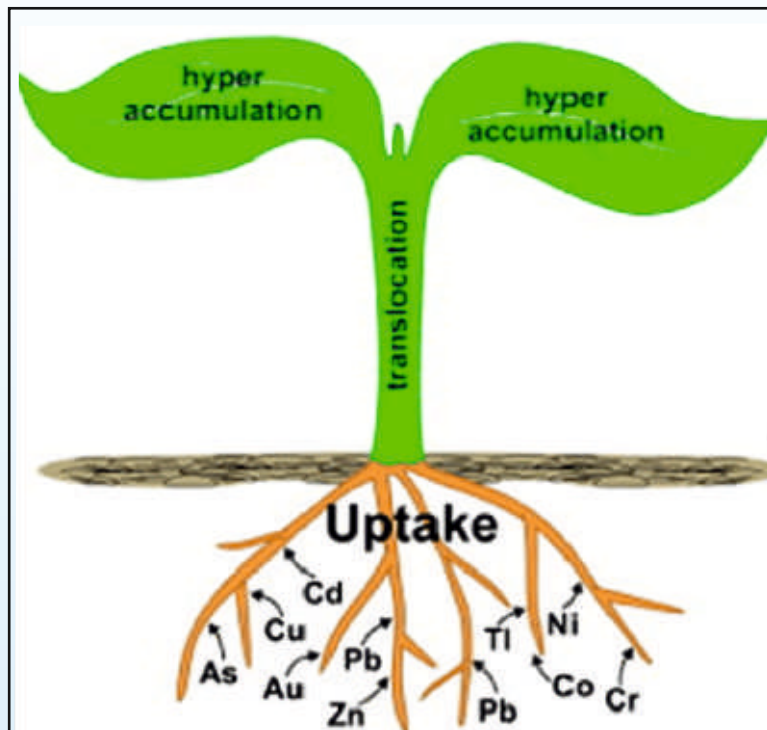
In highly contaminated areas cultivation of leafy vegetables and vegetables with edible roots should be avoided as leaves and roots are found to contain high levels of heavy metal concentration.

Farming of non edible plants like ornamental and flowering plants is also suggested for contaminated areas.



Conclusion

With increasing industrialization, heavy metal contaminations in crops are also increasing. Soil-water-crop ecosystem should be constantly monitored with well defined guidelines. To meet the growing toxicological hazards in agricultural sector, multidimensional approach is needed like sound scientific analysis, empowering the farmers with latest knowledge and techniques and an efficient regulatory authority. If the required steps are delayed, there will be severe consequences regarding public health in the days to come.



Fractional Derivative: An Introduction

Mr. Ratan Kumar Sharma

(Asst. Prof. of Maths, BSH Dept, B.A.College of Engineering & Technology, Jamshedpur)

1. Introduction :-

The concept of derivative is the main idea of calculus. It shows the sensitivity to change of a function i.e. the rate or slope of a quantity. The current definition of derivative was suggested by Newton in 1666. Newton with a physical viewpoint of derivative interpreted the instantaneous velocity. The intuition of researchers from derivative and integral is based on their geometrical or physical meaning, e.g. the first and second order derivative of displacement is called velocity and acceleration respectively (also jerk and jounce for 3th and 4th derivatives). As well, integral of a curve function means the area under the curve. This form of classical calculus was developed extensively over four centuries. Today, scientists are able to describe and model many physical phenomena with an ordinary differential equation. In many cases, however, the classical calculus is not able to describe exactly these complex phenomena. Under a small deformation, for example, the relationship between the force and displacement in an ideal spring (small deformations in elastic materials) is linear, i.e. force is related to the zero derivative of displacement, while in an ideal damper, the force is proportional to the velocity of extension or compression. In other words, force is related to the first derivative of deformation. Which law, however, governs the materials with intermediate mechanical properties (i.e. between ideal spring and ideal damper)? With this aim, many mathematicians try to answer the question and to model as well as to analyze the mechanical behavior of these non-linear systems by means of fractional calculus.

2. Definition of Fractional Calculus (L. Euler)

Integration is the inverse process of the differentiation. If D stands for differentiation with respect to x , then

$$D \equiv \frac{d}{dx}$$

And If J stands for integration with respect to x

$$J = \frac{1}{D} = D^{-1} \text{ or } D = \frac{1}{J} = J^{-1}$$

Let us consider the following relation

$$D^n f(x) = \frac{d^n f(x)}{dx^n} = f^{(n)}(x)$$



EQUATIONS & EMOTIONS

If the power n to D is positive integer, the above relation stands for n th derivative of $f(x)$ and if the power n to D is negative integer, then it stands n th integration of $f(x)$. Similarly If the power n to J is positive integer, the above relation stands for n th Integration of $f(x)$ and if the power n to J is negative integer, then it stands n th derivative of $f(x)$. If the integer n is replaced by a real number, the above differentiation or integration is called fractional differentiation or fractional integration

Example:- Let $f(x) = x^m, m \geq n$

$$f^{(n)}(x^m) = \text{nth derivative} = \frac{m!}{(m-n)!} x^{m-n}$$

Let us replace the whole number n by any fractional number r , we have the following

$$f^{(r)}(x^m) = \frac{m!}{(m-r)!} x^{m-r}$$

Fractional Derivative Of $f(x)=x$ when $r = \frac{1}{2}$

$$\begin{aligned} f^{(\frac{1}{2})}(x) &= \frac{1!}{(1-\frac{1}{2})!} x^{1-\frac{1}{2}} \\ &= \frac{1!}{(\frac{1}{2})!} x^{\frac{1}{2}} = 2\sqrt{x} \end{aligned}$$

3. Basic Fractional Operators

3.1. The Fractional Integral

Theorem 3.1 (Cauchy formula for repeated integration):- Let f be some continuous function on the interval $[a; b]$. The n th repeated integral of f based at a ,

$$f^{(-n)}(x) = \int_a^x \int_a^{\sigma_1} \int_a^{\sigma_2} \dots \int_a^{\sigma_{n-1}} f(\sigma_n) d\sigma_n d\sigma_{n-1} \dots d\sigma_2 d\sigma_1 \dots \dots \dots (1)$$

Is given by single integration

$$f^{(-n)}(x) = \frac{1}{(n-1)!} \int_a^x (x-t)^{n-1} f(t) dt \dots \dots \dots (2)$$

Proof :- We shall prove the result by mathematical induction .When $n = 1$, from equation (1), we have

$$\int_a^x f(\sigma_1) d\sigma_1 = \int_a^x f(t) dt = \frac{1}{(n-1)!} \int_a^x (x-t)^{n-1} f(t) dt$$

Thus, . The result is true for $n = 1$. Let us suppose that the result is true for $n = m$, we shall prove it for $n = m+1$. When $n = m$, from equation (2)

$$\int_a^x \int_a^{\sigma_1} \int_a^{\sigma_2} \dots \int_a^{\sigma_{m-1}} f(\sigma_m) d\sigma_m d\sigma_{m-1} \dots d\sigma_2 d\sigma_1 = \frac{1}{(m-1)!} \int_a^x (x-t)^{m-1} f(t) dt \dots \dots (3)$$

Now ,

$$\begin{aligned} f^{(-m+1)}(x) &= \int_a^x \frac{1}{(m-1)!} \int_a^{\sigma_1} (x-t)^{m-1} f(t) dt d\sigma_1 \\ &= \frac{1}{(m-1)!} \int_a^x \left\{ \int_a^{\sigma_1} (x-t)^{m-1} d\sigma_1 \right\} f(t) dt \\ &= \frac{1}{(m)!} \int_a^x (x-t)^m f(t) dt \end{aligned}$$

Definition 1 (Riemann-Liouville Operator): Let f be a continuous function , $\alpha \in R_+$ and $t \in R$. The fractional integral of order α is defined as follow ,

$$J^\alpha f(x) = \frac{1}{\Gamma(\alpha)} \int_0^t (t-u)^{\alpha-1} f(u) du \dots \dots \dots (4)$$

3.2. Fractional Derivatives (Riemann-Liouville definition)

The fractional differentiation of any positive real power by combining the standard differential operator is with a fractional integral of order between 0 and 1. We just have to choose which operator to apply first. For example, we can define the derivative of order 1.5 of a function $f(t)$ as either of the following:

$$\begin{aligned} D^{1.5} f(t) &= D^2 J^{0.5} f(t) \\ D^{1.5} f(t) &= J^{0.5} D^2 f(t) \end{aligned}$$

These two approaches provide the basis for two different definitions of the fractional derivative. The first definition, in which the fractional integral is applied before differentiating, is called the Riemann-Liouville fractional derivative. The second, in which the fractional integral is applied afterwards, is called the Caputo derivative. These two forms of the fractional derivative each behave a bit differently, as we will see. Here are their formal definitions:

Definition 2. Let $\alpha \in R_+$ and n be the nearest integer greater than α . The Riemann-Liouville fractional derivative of order α of a function $f(t)$ is given by:

$$D^\alpha f(t) = \frac{d^n}{dt^n} J^{n-\alpha} f(t) = \frac{1}{\Gamma(n-\alpha)} \frac{d^n}{dt^n} \int_0^t (t-u)^{n-\alpha-1} f(u) du$$

Definition 3. Let $\alpha \in R_+$ and n be the nearest integer greater than α . The Caputo fractional derivative of order α of a function $f(t)$ is given by:

$$D^\alpha f(t) = J^{n-\alpha} \frac{d^n}{dt^n} f(t) = \frac{1}{\Gamma(n-\alpha)} \int_0^t (t-u)^{n-\alpha-1} f^{(n)}(u) du$$

3.3. Examples and properties

Lemma 3.2. Let $\alpha > 0$, $C, K \in R$, and let f and g be functions such that their fractional derivatives and integrals exist. Then

$$J^\alpha (Cf(t) + Kg(t)) = CJ^\alpha f(t) + KJ^\alpha g(t)$$



EQUATIONS & EMOTIONS

$$D^\alpha(Cf(t) + Kg(t)) = CD^\alpha f(t) + KD^\alpha g(t)$$

$$D_*^\alpha(Cf(t) + Kg(t)) = CD_*^\alpha f(t) + KD_*^\alpha g(t)$$

Since $\int_0^t (t-u)^{\alpha-1} du = \frac{t^\alpha}{\alpha}$, the fractional integral of order α of 1 is given by

$$J^\alpha 1 = \frac{1}{\Gamma(\alpha)} \int_0^t (t-u)^{\alpha-1} \cdot 1 \cdot du = \frac{t^\alpha}{\alpha \Gamma(\alpha)} = \frac{t^\alpha}{\Gamma(\alpha+1)}$$

The n th fractional integral of order α of 1 is then given by:

$$J^{n\alpha} 1 = \frac{t^{n\alpha}}{\Gamma(n\alpha+1)}$$

Theorem 3.3. The Riemann-Liouville derivative of order $\alpha > 0$ with $n-1 < \alpha < n$ of the power function $f(t) = t^p$ for $p \geq 0$ is given by:

$$D^\alpha t^p = \frac{\Gamma(p+1)}{\Gamma(p-\alpha+1)} t^{p-\alpha}$$

Proof. We compute the Riemann-Liouville Derivative of power $\alpha > 0$ as:

$$D^\alpha t^p = \frac{1}{\Gamma(n-\alpha)} \frac{d^n}{dt^n} \int_0^t (t-u)^{n-\alpha-1} u^p du$$

Let $u=vt$ for $0 \leq v \leq 1$, $du = tdv$ and we get

$$\begin{aligned} D^\alpha t^p &= \frac{1}{\Gamma(n-\alpha)} \frac{d^n}{dt^n} \int_0^t ((1-v)t)^{n-\alpha-1} (vt)^p t dv \\ &= \frac{1}{\Gamma(n-\alpha)} \int_0^1 (1-v)^{n-\alpha-1} v^p dv \frac{d^n}{dt^n} t^{n-\alpha+p} \\ &= \frac{1}{\Gamma(n-\alpha)} \int_0^1 (1-v)^{n-\alpha-1} v^p dv \frac{(n-\alpha+p)!}{(p-\alpha)!} t^{p-\alpha} \\ &= \frac{\Gamma(n-\alpha+p+1)}{\Gamma(n-\alpha)\Gamma(p+1-\alpha)} \left\{ \int_0^1 (1-v)^{n-\alpha-1} v^p dv \right\} t^{p-\alpha} \\ &= \frac{\Gamma(n-\alpha+p+1)}{\Gamma(n-\alpha)\Gamma(p+1-\alpha)} \beta(n-\alpha, p+1) t^{p-\alpha} \\ &= \frac{\Gamma(p+1)}{\Gamma(p+1-\alpha)} t^{p-\alpha} \end{aligned}$$

Example:-Derivative of order 0.5 of x

We have the following formula

$$D^\alpha t^p = \frac{\Gamma(p+1)}{\Gamma(p+1-\alpha)} t^{p-\alpha}$$

Here, $p = 1$, $\alpha = 0.5$ and replacing t by x in the above formula, we have

$$\begin{aligned} D^{0.5} x &= \frac{\Gamma(1+1)}{\Gamma(1+1-0.5)} x^{1-0.5} \\ &= \frac{\Gamma(2)}{\Gamma(\frac{3}{2})} x^{0.5} \\ &= 2 \sqrt{\frac{x}{\pi}} \end{aligned}$$

4.Application:-

Fractional calculus has been used to model physical and engineering processes, which are found to be best described by fractional differential equations. It is worth noting that the standard mathematical models of integer-order derivatives, including nonlinear models, do not work adequately in many cases. In the recent years, fractional calculus has played a very important role in various fields such as mechanics, electricity, chemistry, biology, economics, notably control theory, and signal and image processing. Major topics include anomalous diffusion, vibration and control, continuous time random walk, Levy statistics, fractional Brownian motion, fractional neutron point kinetic model, power law, Riesz potential, fractional derivative and fractals, computational fractional derivative equations, nonlocal phenomena, history-dependent process, porous media, fractional filters, biomedical engineering, fractional phase-locked loops, fractional variational principles, fractional transforms, fractional wavelet, fractional predator-prey system, soft matter mechanics, fractional signal and image processing; singularities analysis and integral representations for fractional differential systems; special functions related to fractional calculus, non-Fourier heat conduction, acoustic dissipation, geophysics, relaxation, creep, viscoelasticity, rheology, fluid dynamics, chaos and groundwater problems. All these fractional derivatives definitions have their advantages and disadvantages. The purpose of this note is to present the result of fractional order derivative for some function and from the results establish the disadvantages and advantages of these fractional order derivative definitions.



EQUATIONS & EMOTIONS

An enduring affair !!!

Ms. Soma Ghosh

(Asst. Prof of Physics, Arka Jain University, Jamshedpur)

The attraction was intense. Inevitably, this feeling changed to love..... for my best friend forever or BFF as many would have it. Always accessible, always supportive. As the adage goes 'a friend in need is a friend indeed !' . It is through my friend's eyes that I learnt to appreciate the myriad colours of the world around me, be it the good, the bad or the ugly...

My friend has been my constant companion in all my flights of fancy where imagination ran wild, dreams took shape & had a colour of their own. I experienced the thrill of daring adventures & journey into the unknown. It was vivid, kaleidoscopic & almost tangible ! Life was never boring with my best friend around. Needless to say , our attachment grew only stronger.

In times of distress, I always had the support I needed. During my exams or during any difficult situation in life, the one I always ran back to was my friend. The wisdom I gained would obviously bring immense solace. From rib-tickling laughter to the throes of transition over the years & everything in between; this relationship has only grown from strength to strength !

I do wish everyone has such a friend in their life. I assure you, it is one of the most beautiful & enriching relationship you will ever have. Ooops...I almost forgot to introduce all of you to the object of my affection...it is books ! Au revoir !



Don't just stand there; make something happen.

EQUATIONS & EMOTIONS

Library: An Information center

Ms. Kulwinder Kour

(Assistant Librarian ,B.A.College of Engineering &Technology,Jamshedpur)

Library is an organized collection of sources of information and similar resources, made accessible to a defined community for reference or borrowing. It provides physical or digital access to material, and may be physical building or room, or a virtual space, or both. A library's collection can include books, periodicals, manuscripts, films, map, prints, documents, CDs, cassettes, videotapes, DVDs, blu-ray discs, e-books, audio books, databases, and other formats. Libraries range in size from a few shelves of books to several million items. In Latin and Greek, the idea of bookcase is represented.



The first library consisted of archives of the earliest form of writing the clay tablets in Cuneiform script discovered in Sumer, some dating back to 2600 BC. Private or personal libraries made up written books appeared in classical Greece in the 5th century BC.


The various information Sources for the Library are enlisted below:

- (A) Primary Sources,**
- (B) Secondary Sources and**
- (C) Tertiary Sources.**

A. Primary Sources: A document that contains original information published for the first time. These are materials which are original in nature. They usually take the form of a journal article.

1) Periodical: A publication with a distinctive title which appears at stated or regular intervals, without prior decision as to when the last issue shall appear. It contains article, stories or other writings, by several contributors.

2) Research Reports: A document prepared by an analyst or strategist who is a part of the investment research team in a stock brokerage or investment bank or any organization. A research report may focus on a specific stock or industry sector, a currency, and commodity or fixed- income instrument, or even on a geographic region or country, Research report generally, but not always, have “actionable” recommendation.



The worst distance between two people is misunderstanding.

EQUATIONS & EMOTIONS

3) Conference Proceedings: Conferences are a major source of cutting edge research, particularly in science & engineering. At conferences, researchers present paper on the research they are doing and obtain feedback from the audience. The papers presented in the conference are then usually published in a volume called conference proceedings. It may be months before such information is published as a journal article, or it may never be published.

4) Patents: It is a legal document by which a designated authority gives to the owner of an invention the exclusive rights to use or sell it.

5) Standards: It is a technical specification or other document available to the public drawn up with the cooperation and consensus or general approval of all interests affected by it, based on the consolidated results of science, technology and experience aimed at the promotion of optimum community benefits and approved by a body recognized on the national, regional or international level.

i) **Dimensional Standards,**

ii) **Quality Standards,**

iii) **Standard test Methods,**

iv) **Stand and terminology,**

v) **Code of practice,**

vi) **Physical and scientific standards.**

6) Trade Literature: Trade literature is a general term including advertising, customer technical communications, and catalogues.

7) Thesis: Research submitted to a faculty to qualify for a university degree.

B.Secondary Sources: A document, which present the content of primary document in a condensed form or list them in a helpful sequence. A secondary source is one that gives information about a primary source. The original information is selected, modified and rearranged in a suitable format for the purpose of easy location for the user.

1) Abstracting and indexing periodicals: It is the process of writing a summary of an article, report, journal or similar publication so the users of an organization may quickly read a digest of the original material and index an alphabetical list of names of authors, places, persons, subject, topics, with indication to exact location.

2) Reviews: A formal assessment of something with the instating change if necessary.

3) Reference Book: The book which are used to answer immediate question of users, these book are kept for reference only and are not allowed to be used outside the library. Any publication which is used to obtain authoritative information may be used for reference.



Be patient. Sometimes you have to go through the worst to get to the best. Give time some time.

EQUATIONS & EMOTIONS

4) Subject Book:

i) Treatise: A treatise is a formal and systematic written discourse on some subject, generally longer and treating it in greater depth than an essay, and more concerned with investigating or exposing the principles of the subject.

ii) Monograph: A separate treatise on a single subject or class of subject or on one person, usually detailed in treatment but not extensive in scope and often containing bibliographies.

iii) Text Book: A textbook is a manual of instruction in any branch of study. Textbooks are produced according to the demands of educational institutions. Schoolbooks are textbooks and other books used in school. Although most textbooks are only published in printed format, many are now available as online electronic books.

C) Tertiary sources: The Tertiary sources consist of information that is a distillation and collection of primary and secondary sources. These include lists of secondary sources. These include lists of all kinds of sources of references work.

1) Directory: It is a document containing lists of names of residents, organizations or business houses in a city, a group of cities or a country. They are in alphabetical order or in order of location in roads, or of firms in trade or business houses in a particular trade or profession.

2) Year Book: A volume often called annual, containing current information of a variable nature; in brief/descriptive and statistical form, which is published once every year. Often yearbooks review the events of a year.

3) Guides to literature: It focuses on a specific subject area or discipline, and lists sources of available information related to it.

4) List of Research in progress: It is a list of Research papers.

5) Bibliography: It is defined as a well organized list of written, printed or otherwise produced records of civilization e.g. book, articles in periodicals etc. It serves the librarians and users in finding documents that they are not aware of.

All the above state sources are conserved in library. A reader can collect the information easily from the library. So library is nothing but an information center.



EQUATIONS & EMOTIONS

Life without friends!

Mr. Debkumar Ray

(Lecturer of English, BSH Dept, B.A. College of Engineering & Technology, Jamshedpur)

It's dull. It's boring. It's devoid of drunken pranks, yearbook shaming and inside jokes about your ex-boyfriend who was overly confident in the fire.

There are all different types of friends that we'll encounter throughout our lives but some are who would remain so for ever & ever without a question – the friends your life needs and isn't complete without.

The friendships we forge across our lifetimes are hugely important to our wellbeing. They are sources of comfort, joy, and love in a world that can often seem harsh and unwelcoming. They shape us as individuals and form a large part of our memories. They provide stability against the backdrop of an ever changing reality.

If you don't attend every birth, wedding, anniversary party and funeral together, you may not have been friends otherwise. You both were probably in different grades, had different friends, had different interests but here you are – twenty years later with inside jokes, constant support, and someone who understands exactly how flutter shit crazy your family is at thanksgiving.

So you grab a seat, set up the Instagram video and wait for the magic to happen because this is your life, your family, and you both share it together.


They loved you when you were awkwardly blossoming from the acne riddled freshman who carried her entire locker to every class because she was scared of not being able to get a book for biology lab in case she couldn't remember her combination.

Awkward hairstyles, rubber band bracelets hinting at what some stupid activities but yes again true of your age, you were skilled at and grinding up on that bare floor at the fancy dance just so you could be cool bumping up and down to "I'm in love with a stripper" pretending that they were your lifegoals?

No judgment because she did the same thing and now you both laugh about it at cocktail hour. Boyfriends are great for snuggling, killing spiders, and off road hiking with.

Girlfriends are great for baking dessert, kissing, and asking someone for directions. Individually, they each have their own awesome benefits.

But the girlfriend/boyfriend best friend is the combination of someone you cuddle with, make plans with, and can obsess over silly things like, Netflix, analyzing what your co-worker meant when she looked you up and down and said, "You look nice" with a slight tone of arrogance. The best friend combines passion, emotion, and laughter, and family, and someone who you sincerely want to do everything with and never grow tired.



Disappointments are just God's way of saying "I've got something better". Be patient, live life, have faith.

EQUATIONS & EMOTIONS

They were there when you gained some weight when you were eleven and going through that stage. They were there when you got braces. And when you got them off, and when you wore a retainer. They were there when you were still playing Barbies, then when you purposely threw them out to become a big kid.

They were there when a boy asked you to slow dance in the second floor of your college social and also when you obsessively drew hearts around his name and already knew what you'd name your babies.

They were there when you felt your first heartbreak, when your mom got sick, and when your dad lost his job. They were there when your boyfriend cheated on you, and when you were nominated Homecoming Queen. They were there when you felt fat, and insecure, and not good enough and they talked you out of it.

And chances are, today, they're still first on your speed dial. They're maids of honors, or bridesmaids, or godmothers, or Aunties to your kids.

They're still judging you for that time you ate a whole bag of cookies in the course of one movie, but honestly, your overeating, completely dramatic, somewhat cynical view of the world and your habits that involve overanalyzing, laughing too loud, and feeling no remorse for eating your weight in chocolate, is what they love about you.

The reality never sets back; dynasties would pass by yet it's been glittering on and on, stronger and stronger from the time immemorial and would last till this beautiful planet exists.

The modern world has given us many things, but instant communication across the entire planet is one of the most life-altering. No longer are you restricted by the supply of potential friends in your local vicinity; the world is your oyster.



The only time you should ever look back, is to see how far you've come.

EQUATIONS & EMOTIONS

On Literature: A Few Words

Dr. Manoj K Pathak

(A Multi-lingual Poet, Author, Editor)

Asst. Professor of English, ARKA JAIN University, Jamshedpur

Defining Literature and its Scope

In general terms, 'literature' is a term used to describe written and sometimes spoken material as its Latin root *litteratura* (derived itself from *littera*: letter or handwriting) suggests referring to all written accounts. But in academic and artistic purview, the word literature suggests a higher art form; merely putting words on a page doesn't necessarily equate to creating literature. Some works of literature are considered to be culturally representative of a particular genre (poetry, prose, or drama). Literature most commonly refers to works of the creative imagination, including poetry, drama, fiction, nonfiction, and in some instances, journalism, and song. Thus, literature represents the culture and tradition of a language or a people.

The conceptual meaning has changed over time to include texts that are spoken or sung (oral literature), and non-written verbal art forms. Further, developments in print technology have allowed an ever-growing distribution and proliferation of written works, culminating in electronic literature.

Literature can be distinguished according to major forms such as the novel, short story or drama; and works are often categorized according to historical periods or their adherence to certain aesthetic features or expectations (genre).

Literature is a form of human expression. It voices out the inner sensibilities, the tender feelings, and the conscious or sub-conscious stream of thoughts. But not everything expressed in words—even when organized and written down—is counted as literature. Those writings that are primarily informative—technical, scholarly, journalistic—would be excluded from the rank of literature by most, though not all, critics. Certain forms of writing, however, are universally regarded as belonging to literature as an art. Individual attempts within these forms are said to succeed if they possess something called artistic merit and to fail if they do not. The nature of artistic merit is less easy to define than to recognize. The writer need not even pursue it to attain it. On the contrary, a scientific exposition might be of great literary value and a pedestrian poem of none at all.

Literary language

In some literatures the language employed is quite different from that spoken or used in ordinary writing. This marks off the reading of literature as a special experience. In the Western tradition, it is only in comparatively modern times that literature has been written in the common speech of cultivated men. A literary language is the form of a language used in its literary writing. It can be either a non-standard dialect or standardized variety of the language. It can sometimes differ noticeably from the various spoken dialects, but difference between literary and non-literary forms is greater in some languages than in others.

Psychic Impact

Evidently, it is suggested that literature allows readers to access intimate emotional aspects of a person's character that would not be obvious otherwise. That literature aids the psychological development and understanding of the reader, allowing someone to access emotional states from which they had distanced themselves. D. Mitchell, for example, explains how one author used young-adult literature to describe a state of "wonder" she had experienced as a child. Some researchers focus on the significance of literature in an individual's psychological development. For example, language learning uses literature because it articulates or contains culture, which is an element considered crucial in learning a language. This is demonstrated in the case of a study that revealed how the presence of cultural values and culturally familiar passages in literary texts played an important impact on the performance of minority students in English reading. Psychologists have also been using literature as a tool or therapeutic vehicle for people, to help them understand challenges and issues.

It is further explained that the time and emotion which a person devotes to understanding a character's situation makes literature "valid in the study of emotion". Thus literature can unite a large community by provoking universal emotions, as well as allowing readers to access cultural aspects that they have not been exposed to, and that produce new emotional experiences.

Importance of Literature

Works of literature, at their best, provide a kind of blueprint of human society. From the writings of ancient civilizations such as Indus Valley, Egypt and China to Greek philosophy and poetry, from the epics of Valmiki, Vyas, Homer to the plays of Kalidasa, William Shakespeare, from Jane Austen and Charlotte Bronte to Maya Angelou, works of literature give insight and context to all the world's societies. In this way, literature is more than just a historical or cultural artifact; it can serve as an introduction to a new world of experience.

But what can be considered to be literature may vary from one generation to the next. For instance, Herman Melville's 1851 novel *Moby Dick* was considered a failure by contemporary reviewers. However, it has since been recognized as a masterpiece and is frequently cited as one of the best works of Western literature for its thematic complexity and use of symbolism. By reading *Moby Dick* in the present day, one can gain a fuller understanding of literary traditions in Melville's time.

Development of Skills

It is noteworthy that students who study literature and read for pleasure have a higher vocabulary, better reading comprehension, and better communication skills, such as writing ability. Communication skills affect people in every area of their lives, from navigating interpersonal relationships to participating in meetings in the workplace to drafting intra-office memos or reports.

When students analyze literature, they learn to identify cause and effect and are applying critical thinking skills. Without realizing it, they examine the characters psychologically or sociologically. They identify the characters' motivations for their actions and see through those actions to any ulterior motives.



EQUATIONS & EMOTIONS

Evolves Emotions

Some studies say that people who read literature have more empathy for others, as literature puts the reader into another person's shoes. Having empathy for others leads people to socialize more effectively, solve conflicts peacefully, collaborate better in the workplace, behave morally, and possibly even become involved in making their community a better place.

Along with empathy for others, readers can feel a greater connection to humanity and less isolated. Students who read literature can find solace as they realize that others have gone through the same things that they are experiencing or have experienced.

Summing up with Quotes about Literature

Here are some quotes about literature from literary stalwarts themselves:

- **William Shakespeare:** "I'll call for pen and ink and write my mind."
- **Robert Louis Stevenson:** "The difficulty of literature is not to write, but to write what you mean; not to affect your reader, but to affect him precisely as you wish."
- **Jane Austen:** "The person, be it gentleman or lady, who has not pleasure in a good novel, must be intolerably stupid."
- **Connie Willis:** "That's what literature is. It's the people who went before us, tapping out messages from the past, from beyond the grave, trying to tell us about life and death! Listen to them!"
- **Northrop Frye:** Literature speaks the language of imagination, and the study of literature is supposed to train and improve the imagination.



जलधारा न बनें अश्रुधारा

डॉ ईशिता घोष

बी.ए कॉलेज ऑफ़ इंजीनियरिंग एंड टेक्नोलॉजी

कल कल करती नदी की धारा अब सिमटने लगी क्यों नदियों से,
आओ सोचे जरा कैसे खो गयी हमसे, जो हमारी ही थी सदियों से।

वह कागज़ की कस्तियों का इतराकर चलना, डूबना, संभालना,
कहाँ गई वह खुशियों की नदियों का बहना और हँसना।।

वह ताल, वह तालाब, वह पोखर में मेंढक का टराना,
बच्चों की वह मस्तियाँ, वह बचपन का खिलखिलाना।

ये कहाँ आ गए यादों को खोकर विज्ञान की उड़ान से,
कि धरती माता होने लगी रूष्ट अपने ही असम्मान से..

आओ अब न और होने दे यूँ हरयाली का समापन,
मचलते तितलियों, चमकते जुगनुओं और झरनों का सुशीला सरगम।

तरसती रह गयी क्यों आसमाँ से बूँदें अब जमीं में लिपटने से,
आओ प्यारों कुछ कर दिखाएं; रोकले इस जलधारा को अश्रुधारा बनकर सिमटने से।



EQUATIONS & EMOTIONS

New Born Girl Wishes In This Kalyuga

Ms. Ruchi Kumari

(Assistant Librarian, B.A.College of Engineering &Technology,Jamshedpur)

I'm a new born girl....
Just wish for a secure future...
I'm not wanting toys,
But I don't want to become anyone's toy too...
I want to live without fear
Outside the house,
I want to make my country beautiful,
Like there is no fear of cruel barbarian's...
I have seen many dreams in my tiny eyes...
I want to raise my family and country's name high...
To fulfill my dreams,
I want to fly high in the sky like a bird...
I also want to say to our society,
Even if you don't worship us as a goddesses,
That's not a big deal...
But respect every women by heart...

EQUATIONS & EMOTIONS

Side effects of an invigilation duty!!

Dr. Ishita Ghosh

(HoD, BSH Dept, B.A.College of Engineering & Technology, Jamshedpur)

It's now twelve years that I am a BACETian,
And mastered many arts besides being an academician.
One of the many being the duty of an invigilator,
Though a responsible job but with acknowledgements minor.

Yet it's a great time for my own introspections
A silent atmosphere for infinite imaginations.
Criss crossing my mind without fear or favour,
Just like the smoothly gliding pen on an answer paper.

Disgusting sessions are though verifying the answer sheets,
And keeping a strict vigil or catching hold of microchits.
Humming and the murmurs of examinees irritate me a lot,
Disturbing the streamlined flow of my endless thoughts.

Equally funny seems to me the flying squad's entry,
who walk around with an air of unnecessary dignity;
Now the roles have reversed as I am no longer an examinee,
But being an invigilator is better than being an examinee.

THAT'S A GUARANTEE!!!



Turn your wounds into wisdom---- Oprah Winfrey

Science & Technology can improve lives of the specially-abled

Ms. Ritika Tiwary

(Student of 1st year, B. A. College of Engineering & Technology, Jamshedpur)

In recent decades, new technologies have a dramatic impact on the way we live. But those with disabilities often find it difficult to operate technology in the way able persons do. The disabled students have long been subject to inadequate and unequal educational opportunities. But the rapid development and application of computer based technology has created a large change in available options for disabled students.

World famous genius Stephen Hawking suffers from Amyotrophic Lateral Sclerosis (ALS) and has almost no ability to move or speak on his own. Instead, he uses speech generating technology in which computer software translates what he types on a keyboard into a synthesized voice. Hawking achieved commercial success with several works of popular science in which he discusses his theories and cosmology in general. His book *A Brief History of Time* appeared on the Sunday Times bestseller list for a record-breaking 237 weeks. Hawking was a Fellow of the Royal Society, a lifetime member of the Pontifical Academy of Sciences, and a recipient of the Presidential Medal of Freedom, the highest civilian award in the United States. In 2002, Hawking was ranked number 25 in the BBC's poll of the 100 Greatest Britons.

There are various technologies for every category of disability. Students dealing with blindness/visual impairment or with physical limitations that prevent them from typing on a keyboard, can use text to speech device to compose their assignments. There is a huge improvement over Braille because once the program is installed on computer it can read anything on the screen with no waiting for braille translation.

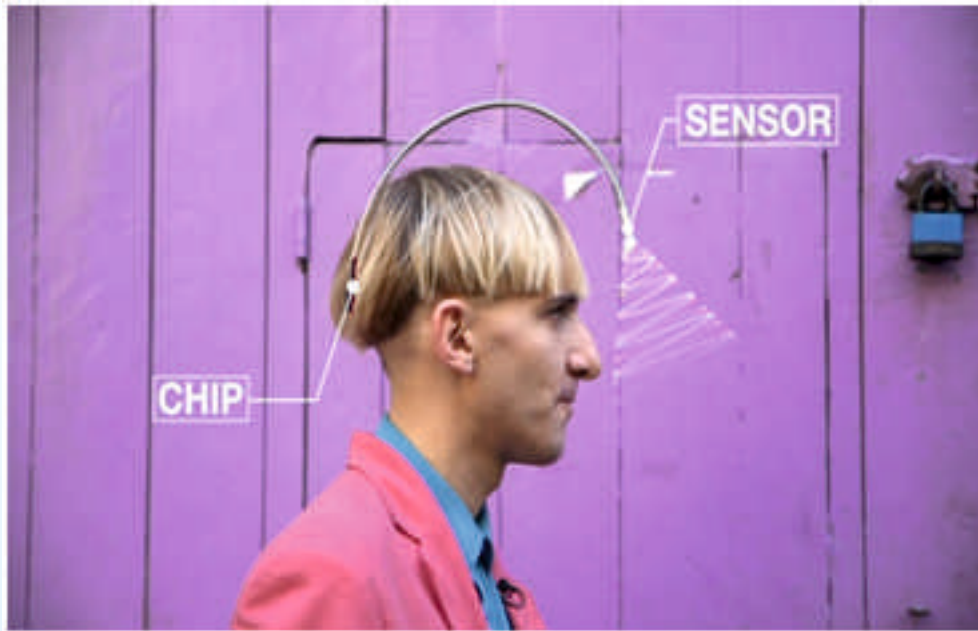


Neil Harbisson is a Spanish-born British-Irish cyborg artist who was born with Achromatopsia condition in which he can only see Black and white colours. Then with the help of science, he had created a camera which curls over the head like antenna and converts colour input into some specific sounds that help people listen to colours. He is best known for being the first person in the world with an antenna implanted in his skull and for being legally recognized as a cyborg by a government. His antenna sends audible vibrations through his skull to report information to him. This includes measurements of electromagnetic radiation, phone calls, and music, as well as videos or images which are translated into audible

EQUATIONS & EMOTIONS

vibrations. His WiFi-enabled antenna also allows him to receive signals and data from satellites.

Since 2004, international media has described him as the world's first cyborg or the world's first cyborg artist. In 2010, he co-founded the Cyborg Foundation, an international organisation that defends cyborg rights, promotes cyborg art and supports people who want to become cyborgs. In 2017, he co-founded the Transpecies Society, an association that gives voice to people with non-human identities, advocates for the freedom of self-design and offers the development of new senses and organs in community.



Colorblind Cyborg Uses Antenna to Hear Colors



Live for each second without hesitation—Elton John

EQUATIONS & EMOTIONS

Role of Engineering in Transforming Society and their Professional Responsibility

Abhisek Thakur

(3rd year, Mechanical Engineering, B.A.College of Engineering & Technology, Jamshedpur)



- ❖ “Scientist discover that which exists. An engineer creates that which never was” --- Theodore von Karman
- ❖ “People enjoy what technology can do for them while often ignoring what it can do to them” ----Edward Wenk

Define Engineering

- “Engineering is professional art of applying science to the optimum conversion of the resources of nature to uses of human kind.”

Let's examine the relationship

- “Scientist study the world as it is, engineers create the world that never has been”
- “Engineering is the application of science to the common purpose of life”
- The main focus of scientist is to develop knowledge and understanding of the physical universe. Science is the pursuit of knowledge in its purest sense whereas engineering is using science for the society.

What Engineers Do?

1. Design products.
2. Design plants in which those products are made.
3. Develop and Implement way to extract.
4. Harness the power of sun and wind to satisfy the nation's power need.

Various Roles.....

- As an analyst
- As a designer
- As an Innovator
- As a social catalyst

Engineer as a Humanity

- Engineering is intimately connected to the humanities because it is the application of scientific theory to solve certain problems of humanity.

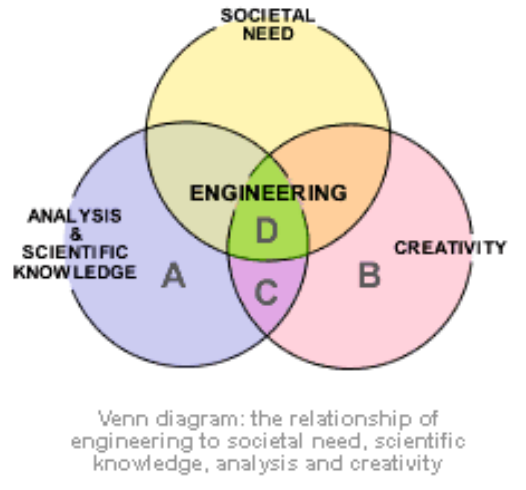


Keep calm and carry on---- Winston Churchill

EQUATIONS & EMOTIONS

Engineering as Liberal Arts!

Social Responsibilities of Engineer: It means a commitment from the engineering profession to place the public safety and interest ahead of all other considerations.



Engineer is not stationary Profession.....

- ❖ The 21st century will be defined by some of the huge challenges now facing humanity.
- ❖ This year engineering graduate will face several issues throughout their working careers.
- ❖ The demand of engineering skills is likely to be higher than ever before in order to deliver sustainable engineering system.

Engineering And Society

- ❖ “Engineering is great profession. There is a fascination of watching a figment of the imagination emerges..... To the engineer false the job of clothing the bare bones of science with life, comfort, and hope”----- Herbert Hoover

An Engineer Is Professional

- ❖ A professional is a person who is paid to undertake a specialized set of tasks and to complete them for a fee.
- ❖ Due to personal and confidential nature in many professional services, a great deal of trust is required for it.

Conclusion

- ❖ YOUTH AS ENGINEERS CAN BE THE INCREDIBLE PEOPLE WHO CAN SUPPORT THE LIVING.
- ❖ YOUNGSTER AS ENGINEERS ARE THE PEOPLE WHO CAN TRANSFORM THE NATION.

Waste Plastic-to-road Technology

Durgesh Sahu

(1st year Student of Mechanical Engineering, B.A. College of Engineering and Technology, Jamshedpur)

A Government order in November 2015 has made it mandatory for all road developers in the country to use waste plastic, along with bituminous mixes, for road construction. This is to help overcome the growing problem of plastic waste disposal in India. The technology for this was developed by the 'Plastic Man' of India, Prof Rajagopalan Vasudevan, Professor of Chemistry at Thiagarajar College of Engineering, Madurai. He implemented the use of plastic waste on a road constructed inside the premises of his college in 2002.



Plastic has slowly become an integral part of all human requirements. Plastic carry bags, packaging material, bottles, cups, and various other items have slowly replaced everything made of other material. Plastic garbage is commonly seen around the country and has started causing several problems. Plastic waste clogs drains, causing floods. It chokes animals that eat plastic bags, etc. Plastics found in fields blocks germination and prevent rainwater absorption. Recycling plastic can be done only 3-4 times and melting the plastic for recycling releases highly toxic fumes.

The entire process is very simple. The plastic waste material is first shredded to a particular size using a shredding machine. The aggregate mix is heated at 165°C and transferred to the mixing chamber, and the bitumen is heated to 160°C to result in good binding. It is important to monitor the temperature during heating.

The shredded plastic waste is then added to the aggregate. It gets coated uniformly over the aggregate within 30 to 60 seconds, giving an oily look. The plastic waste coated aggregate is mixed with hot bitumen and the resulting mix is used for road construction. The road laying temperature is between 110°C to 120°C . The roller used has a capacity of 8 tons.

EQUATIONS & EMOTIONS

“The advantages of using waste plastics for road construction are many. The process is easy and does not need any new machinery. For every kilo of stone, 50 gms of bitumen is used and 1/10th of this is plastic waste; this reduces the amount of bitumen being used. Plastic increases the aggregate impact value and improves the quality of flexible pavements. Wear and tear of the roads has decreased to a large extent,” explains the proud Plastic Man of India.

The waste plastic-to- road technology uses end-of-life plastic for road construction. The Reliance industries limited has already piloted a few projects and has constructed nearly 40 kilometers road by mixing 50 tonnes of end-of-life plastic waste with bitumen at its Nagothane manufacturing site in Raigad district. One km of road uses one metric tonne(mt) of waste plastic and saves nearly Rs. 1 lakh as it can be utilised as a substitute for bitumen to the extent of 8-10 percent. So, roughly we can save Rs. 40 lakh. Besides, this plastic also enhances the quality of roads.



This process has generated an additional job for rag pickers.

Plastic waste helps increase the strength of the road, reducing road fatigue. These roads have better resistance towards rain water and cold weather. Since a large amount of plastic waste is required for a small stretch of road, the amount of waste plastic strewn around will definitely reduce.



*I believe every human has a finite number of heartbeats.
I don't intend to waste any of mine ----- Neil Armstrong.*

EQUATIONS & EMOTIONS

A few interesting facts

Compiled by

Ms. Ritika Tiwary

(Student of 1st year, B. A. College of Engineering & Technology, Jamshedpur)

- ❖ 220 million tonnes of old computer and other technological hardware are trashed in the Unites States each year.
- ❖ A diamond will not dissolve in acid. The only thing that can destroy it is intense heat.
- ❖ Einstein received the Nobel Prize for Physics in 1921 for the explanation of the photoelectric effect.
- ❖ Marie Curie was the first person to win two Nobel Prize for science.
- ❖ One third of the world population has never made a telephone call.
- ❖ The first laser was invented in California in 1960.
- ❖ Tim Berners-Lee coined the phrase "World wide web" in 1990.
- ❖ The Ericsson Company first produced cellular phones in 1979.
- ❖ The fastest way to heat certain materials may be to cool them first.
- ❖ Water can boil and freeze at the same time. This occurs at 273.16 K
- ❖ Laser can get trapped in a waterfall.
- ❖ The Eiffel Tower can be 15cm taller during the summer.
- ❖ Twenty percent of Earth's oxygen is produced by the Amazon rainforest.
- ❖ It takes 8 minutes ,19 seconds for light to travel from the sun to the earth.
- ❖ Venus is the only planet to spin clockwise.
- ❖ Stomach acid is strong enough to dissolve stainless steel.
- ❖ The smell of chocolates increases theta brain waves , which triggers relaxation.
- ❖ There are 206 bones in the adult's human body and 300 in the child's developing body.
- ❖ The human eye blinks on average 4.2 million times a year.
- ❖ An ostrich eye is bigger than its brain.
- ❖ Humming bird are the only animal able to fly backward.
- ❖ The biggest egg in the world is laid by an ostrich.
- ❖ Porcupine floats in water.
- ❖ Starfish don't have brains.
- ❖ Houseflies have a life span of two weeks.
- ❖ A cat has 32 muscles in each ear.
- ❖ A crocodile's tongue is attached to the roof of its mouth.
- ❖ The hottest planet in the solar system is Venus.
- ❖ Sound travels about four times faster in water than in air.

EQUATIONS & EMOTIONS

कुछ विचार जिंदगी पर... जरा गौर फरमाया जाए

- ❖ बड़प्पन वह गुण है जो पद से नहीं संस्कारो से प्राप्त होता है।
- ❖ अच्छे लोगों की सबसे बड़ी खूबी यह होती है कि उन्हें याद रखना नहीं पड़ता, वह याद रह जाते हैं।
- ❖ अकड़ तो सब में होती है, झुकता वही है जिनको रिश्तों की फिक्र होती है।
- ❖ जरूरत से ज्यादा वक्त और इज्जत देने से लोग आपको अहमीयत नहीं देते हैं।
- ❖ वह लोग कभी नहीं रुठते जिन्हे मनाने वाले कोई ना हो।
- ❖ सच्चे दोस्त हमें कभी गिरने नहीं देते , ना किसी के नज़रों में और ना किसी के कदमों में।
- ❖ आईना होती है जिंदगी, आप मुस्कुरा दीजिये तो वह मुस्कुरा देती हैं।
- ❖ खामोश रहने के मिज़ाज़ हैं मेरे , इसे गुरुर मत समझिये।
- ❖ क्या खूब था वह बचपन जब उँगलियाँ जोड़ने से दोस्ती हो जाती थी।
- ❖ खुद जैसा इंसान तलाश करोगे तो अकेले ही रह जाओगे।



EQUATIONS & EMOTIONS

Discoveries/Inventions at a glance

Enlisted below are few names of inventors and discoveries who have made our life easier by the application of Science & Technology.

Compiled by

Ms. Ritika Tiwary

(Student of 1st year, B. A. College of Engineering & Technology, Jamshedpur)

Sl.No.	Discovery/Invention	Discoverer/Inventor	Place	Year
1	Barometer	Evangelista Torricelli	Italy	1643
2	Pendulum clock	Christian Huygens	Netherland	1656
3	Law of Gravitation	Sir Issac Newton	England	1687
4	Speed of Light	Olans Roemer	Denmark	1676
5	Law of Motion	Sir Issac Newton	England	1666
6	Machine Gun	James Pockle	England	1718
7	Bicycle	Karl. D.Von	Germany	1817
8	Electric Motor	Michael Faraday	England	1831
9	Microphone	Charles Wheastone	England	1827
10	Ohm's Law	George S.Ohm	Germany	1787
11	AC Dynamo	Michael Faraday	England	1831
12	Telegraph	Samuel Morse	USA	1844
13	Plastic	Alexander Parker	England	1907
14	Dynamite	Alfred Nobel	Sweden	1867
15	Motorcycle	Edward Butler	England	1885
16	Fountain Pen	Petrache Poenaru	USA	1827
17	Electric Transformer	William Stanley	USA	1881
18	Electron	Sir J.J.Thomson	England	1834
19	Radioactivity	Marie Curie& Pierre Curie	France	1898
20	Razor	King Willete	USA	1895
21	$E= mc^2$	Albert Einstein	Switzerland	1905
22	Atom	Ernst Rutherford	England	1910
23	Computer	Charles Babbage	USA	1791
24	Ball pen	Lazlo Biro	Argentina	1888
25	LCD	George H. Heilmeyer	Switzerland	1964

Some Eminent Scientists of India

Here is a list of some of the prominent contributors to advanced scientific research in different areas, including physics, medicine, mathematics, chemistry and biology.

Prafulla Chandra Ray



Famous academician and chemist, known for being the founder of Bengal Chemicals & Pharmaceuticals, India's first pharmaceutical company.

Salim Ali



Naturalist who helped develop Ornithology; also known as the “birdman of India”.

Srinivasa Ramanujan



Mathematician known for his brilliant contributions to mathematical analysis, number theory, infinite series and continued fractions.

C. V. Raman



Physicist who won Nobel Prize in 1930 for his Raman Effect.

Homi Jehangir Bhabha



Theoretical physicist; best known as the chief architect of the Indian atomic energy program.

Jagadish Chandra Bose



Physicist, biologist and archaeologist who pioneered the investigation of radio and microwave optics.

Satyendra Nath Bose



Mathematician and physicist; best known for his collaboration with Albert Einstein in formulating a theory related to the gas like qualities of electromagnetic radiation.

A.P.J. Abdul Kalam



Known for his crucial role in the development of India's missile and nuclear weapons programs.

Har Gobind Khorana



Astrophysicist won the Nobel Prize in 1983 for his research on the evolutionary stages of massive stars.

S.S. Abhyankar



Mathematician; famous for his outstanding contributions to algebraic geometry.

Meghnad Saha



Astrophysicist who developed the Saha equation, which explains chemical and physical conditions in stars.

Subrahmanyan Chandrasekhar



Astrophysicist won the Nobel Prize in 1983 for his research on the evolutionary stages of massive stars.

Raj Reddy



A.M. Turing Award-winning computer scientist, best known for his work related to large scale artificial intelligence systems.

Birbal Sahni



Paleobotanist known for his research on the fossils of the Indian subcontinent.

Prasanta Chandra Mahalanobis



Statistician and physicist who founded the Indian Statistical Institute.

Equations & Emotions



The Science and Literary Club, *The Quest*
BACET, Jamshedpur

