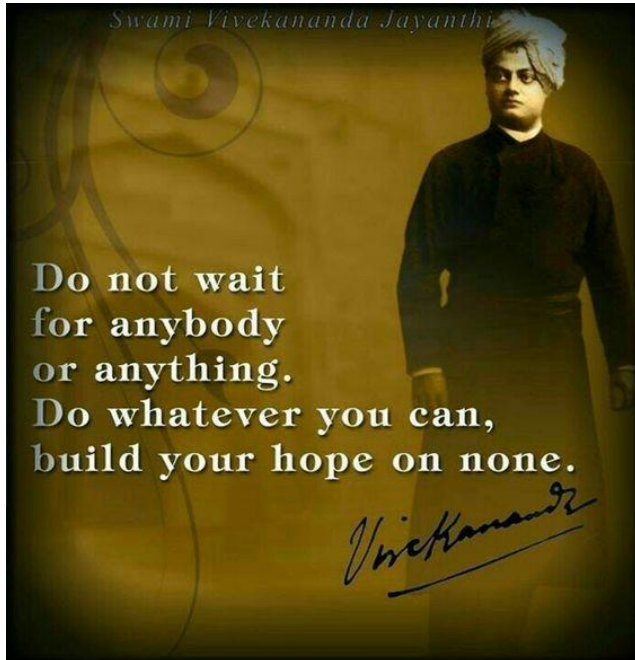


GYAN VIGYAN SARITA: शिक्षा

A Non-organizational, Non-remunerative, Non-commercial and Non-political Initiative
To Mentor Unprivileged Children with a Sense of Personal Social Responsibility (PSR)

Monthly e-Bulletin GyanVigyanSarita: शिक्षा June 01, 2020 (57th Issue)



Stay Home

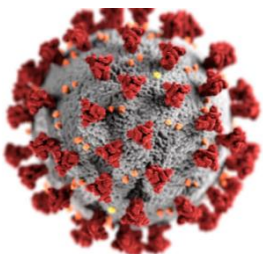
Stay Safe

Stay Healthy

Distance Socially

Keep Growing and Help Others Grow

Let us Conquer CORONA, Collectively and Globally



कोरोना महामारी: चुनौतियों को अवसर में बदलें

(निम्न सन्देश व्हाट्सअप पर खूब चल पड़ा है। इस बार यह सन्देश कार्यरत मजदूरों के चित्र के साथ है, जिससे समाचार की विश्वसनीयता बढ़ जाती है। इस घटना का सत्यापन हम नहीं कर सके, परन्तु सम्बंधित प्रेरणात्मक, सन्देश प्रशंनीय एवं अनुकरणीय है।)

राजस्थान के सीकर में एक गांव के प्राथमिक स्कूल में मजदूरों को कॉरेंटाइन में रखा गया था।

उन मजदूरों ने देखा कि दो दशकों से स्कूल की पेंटिंग नहीं हुई है, साफ सफाई नहीं हुई है। तब उन मजदूरों ने सरपंच के सामने पेंटिंग करने का प्रस्ताव रखा।

तुरंत ही पेंट, चूना, ब्रश इत्यादि का इंतजाम हुआ और उन मजदूरों ने अपने कॉरेंटाइन के दौरान पूरे स्कूल की शक्ल सूरत बदल दी।

और इसके लिए उन्होंने कोई पैसा नहीं लिया बल्कि सरपंच से कहा कि हम यहां पर हैं मुफ्त में खा रहे हैं, तब हमारा फर्ज है कि हम कुछ न कुछ इस स्कूल को दें।



नैतिक सन्देश: दूसरी ओर कुछ लोग सामाजिक-दूरी और लॉकडाउन के निर्देशों का उल्लंघन के साथ कोरोना-जाँबाजों से अभद्र व्यवहार या उन पर हमला करने व उसका औचित्य ठहराने में शौर्य का अनुभव कर रहे हैं, जो कि इस गंभीर वैश्विक विपदा के समय सर्वथा निंदनीय है। उन मजदूरों की सोच प्रशंसनीय और इनकी जिम्मेदारी का बोध अनुकरणीय है। साथ ही उस गांव के सरपंच, शाला प्रधान और कर्मचारियों का आगे बढ़कर श्रमिकों को आवश्यक सुविधा प्रदान कर प्रोत्साहित करना भी प्रशंसनीय है।

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—00—

*True wisdom comes to each of us
when we realize how little we understand about life,
ourselves, and the world around us.*

- Socrates



National Statistics Day: June 29th



Birth: June 29, 1893

Death: June 28, 1972

*The most beautiful thing we can experience is the mysterious.
It is the source of all true art and all science.
He to whom this emotion is a stranger,
who can no longer pause to wonder and stand rapt in awe,
is as good as dead: his eyes are closed.
- Albert Einstein*

Aim at the Best, but...



Conceptual Representation
of
Online Mentoring
An Initiative To Bridge Gap between
Passionate Teachers
and
Desperate Students
Selfless Endeavour
to
Democratize Education
with a sense of
Personal Social Responsibility (PSR)



Equipments at Mentoring Center
1. Desk/Lap-top
2. WebCam
3. Headset with Microphone
4. Digital Pen
AND
Broadband-Internet Connection

Cloud Internet
(Linking platform : cloud based with as low bandwidth as possible for seamless connectivity of audio-video-whiteboard across all Six nodes. Presently Google Hangouts is in use)

Equipments at Learning Center
1. Desk/Lap-top
2. WebCam
3. A Mixer-cum-amplifier with Speakers and Wireless Microphone
5. Overhead Projector.
6. UPS (For Continuous Power Supply to computer, internet modem and L&F)
AND
Broadband-Internet Connection:



Important Links
1. Good Internet Connectivity (Wired Broadband Connection)
2. Subject-wise Coordinator for Each Session to Bridge Learning Gaps between Mentor & Students



Special Features
1. Free and Open to all to adopt. Modify, change, correct
2. Welcomes participation, promotion and facilitation on Zero-Fund-Zero-Asset (ZFZA) basis
3. More details on Technological and Operational – please write on <http://www.gyanvigyansarita.in/contact/>



... start, without loosing time, with whatever is available

Infrastructural requirement for Centres in Interactive Online Mentoring Sessions (IOMS)

Learning Centre (if asked for by Mentor)		Mentoring Centre (if asked for by Mentor)			
Estimated Capital Cost (One Time)					
Particulars		Cost (in Rs)	Particulars		Cost (in Rs)
Desktop (without monitor)		20,000	Laptop		25,000
Projector		9,000	Projector		-
Web camera		2,000	Web camera		-
Mixer cum amplifier with Speaker and Wireless microphones		14,000	Headset with Microphone		3,000
Total (Max. if nothing is available)		45,000	Total		28,000
Wireless Surface Writing Device (WSWD). It shall be required when Learning Centre is ready for collaborative use of Whiteboard.		15,000	Wireless Surface Writing device		15,000
Total with Total with WSWD (at a later date once IOMS stabilizes)		60,000	Total with Total with WSWD		43,000
Estimated Recurring Cost					
a. Internet charges, based on estimated monthly data transfer which depends upon choice of cloud platform, and tariffs of ISP		Internet charges, based on estimated monthly data transfer which depends upon choice of cloud platform, and tariffs of ISP			
b. Cloud Platform Charges, to be shared across Learning Centres					
Cloud platform: Zoom like free Video Conferencing cloud platform with connectivity of 100 participants with uninterrupted session of 40 minutes. This facilitates. The platform is found to be suitable in prevailing requirement of social distancing. This will suit even after LockDown when students continue to get mentored in an uninterrupted manner even after situation becomes normal.		IOMS is since an initiative driven with Personal Social Responsibility (PSR) operating on Zero-Fund-&Zero-Asset (ZFZA) basis. The IT Infrastructure with the Mentors has been in use and is working. But, at any stage if upgradation becomes essential, support of facilitators or learning centres would be gratefully welcomed, on ZFZA basis, to maintain continuity of this selfless initiative. Operating cost of Mentor, if required, shall be supported by Learning Centres			

Specification: These are based on ground level operating experience and need of optimizing the cost on the initiative. This is essential to utilize financial resources, considered scarce, for benefitting more number of students at more number of centres and mentoring centres. These specifications have been updated based on experience of operation of IOMS with available options. MS WhiteBoard a free App of MS office has been tried out in IOMS and is found satisfactory, until a better option is available.

Web Camera: iBall 20.0 HD with a wall mounting

Projector: Portronics POR 624 LED Projector Beam 100 Lumen, Screen Size 130 Inch, 800x480px resolution

Sound System: Ahuja Make PA Mixer Amplifier Model DPA-370, 30 W Max/37W Max, with PA wall speakers PS-300T 10W, and a wireless unit AWM-490V2 Dual Cordless Microphones. This sound input/out when decoupled with USB sound adopter to connect to the computer required echoless environment is achieved in the Classroom and networked mentor and Learning Centres.

Cloud Platform: Zoom Meeting, a free-ware is used for IOMS in video-conferencing mode. This provides connectivity upto of 100 participants and is considered enough to mentor students staying at home, during social distancing. Alternately, other freewares viz. Google Meet, or other Indian products like SayNamaste and others coming up can be used.

Surface Writing Device: HUION make Model WH1409, or Wacom model Intuos with wireless device makes it suitable for communication with base computer in class in an interactive online environment.

UPS: An additional accessory, for uninterrupted continuity of session, based on power availability to be decided by Learning Centre, **not included in above cost estimates.**

Furniture and Lighting: At Learning Centre, as deemed fit by local administration of Learning Centre, **not included in above cost estimates.**



संपादकीय

कोरोना-संक्रमण-काल में भारत वैश्विक भूमिका निभाने में अव्वल

स्वास्थ्य समस्याएँ जब राष्ट्रीय सीमाओं को पार कर जाती हैं और इनका वैश्विक स्तर पर राजनीतिक और आर्थिक प्रभाव पड़ने लगता है, तब वे महामारी (Epidemic) से वैश्विक महामारी (Pandemic) बन जाती हैं। कोरोना इसी श्रेणी में है।

राष्ट्रीय सीमाओं से परे, विश्व के लोगों के स्वास्थ्य का ध्यान रखने के लिये वैश्विक स्वास्थ्य संगठन (WHO) है। इसका निर्माण 1948 में उस समय हुआ जब 1947 में मिस्र में हैजा महामारी फैली और लगभग 20,000 लोगों ने अपनी जान गंवा दी।

विश्व स्वास्थ्य संगठन ने चेचक के खात्मे के लिये बहुत काम किया था परंतु धीरे-धीरे यह एक सजावटी संस्था बन कर रह गया। कोरोना महामारी के दौरान स्पष्ट दिखायी दिया कि विश्व स्वास्थ्य संगठन ने अपनी जिम्मेदारी सही तरीके से नहीं निभायी, उसकी कार्यशैली में दूरदर्शिता का अभाव रहा, वह बीमारी से निपटने के तरीके तलाशने में कम और गैर-जिम्मेदारीपूर्ण बयानबाजी करने में ज्यादा उलझा रहा।

विश्व स्वास्थ्य संगठन वैश्विक नेतृत्व देने में पूर्णतया असफल रहा है। संयुक्त राष्ट्रसंघ (UNO) ने भी इस संकट की घड़ी में दुनिया को नेतृत्व देने में कोई भूमिका नहीं अपनायी। यह संस्थान तमाम देशों में आपसी सहयोग और समन्वय स्थापित करने में भी कारगर नहीं रहा।

जब मानवता खतरे में हो और शीर्ष नेतृत्व इसे बचाने में आगे आकर कोई भूमिका न दिखाये, तब उस नेतृत्व की कार्यक्षमता पर प्रश्न लगना स्वाभाविक हो जाता है। जो संस्थान सामाजिक संरचना को सुरक्षा न दे पाये, जीवन-शैली को स्थायित्व न दे पाये, मानवीय जीवन को शांति न दे पाये, उसका समाप्त हो जाना आवश्यक हो जाता है।

किसी की उपयोगिता की परख कठिन समय में ही होती है। अब समय आ गया है कि इन बूढ़ी संस्थाओं को विदा कर दिया जाये। किसी बूढ़े पेड़ के नीचे नया पेड़ नहीं पनपता है। नया पेड़ उगाने के लिये सबसे पहले बूढ़े पेड़ को जड़ से उखाड़ना पड़ता है।

कोरोना महामारी के दौरान हम सबने सीखा है कि अगर साफ-सफाई पर ज्यादा ध्यान दिया जाये तो इसके प्रकोप से बचा जा सकता है। दूसरे शब्दों में हम कह सकते हैं कि यह महामारी अगर जल्द खत्म नहीं होती है तब भी, हमें तबतक प्रभावित नहीं कर सकती है, जब तक हम अपनी दिनचर्या में इससे बचने के तरीकों को अपनाते रहेंगे।

हमने यह सीख लिया है कि अगर हम अपने हाथों को कुछ अंतराल के बाद साबुन से नियमित धोते रहें, गुनगुना पानी पीते रहें, शरीर की प्रतिरोधक क्षमता बढ़ाने का प्रयास करते रहें, लोगों से मिलते समय पर्याप्त दूरी बनाये रखें, खांसते अथवा छींकते समय अपनी नाक व मुंह को रूमाल से ढँके रहें, दूसरों की तरफ मुंह करके खांसें अथवा छींकें नहीं, सार्वजनिक स्थानों पर थूकें नहीं, खानपान साफ रखें, बाहर से आने पर अपने पहने हुये कपड़े अलग रखें और उन्हें बिना धोये दुबारा पहने नहीं तो हम इस महामारी से बच सकते हैं।

भारतवर्ष के लोगों का जीवन-यापन का तरीका प्राकृतिक होता है, इसलिये इस महामारी का प्रभाव हम भारतीयों पर, पश्चिमी जगत की अपेक्षा कम रहा है। हर भारतीय के सामान्य जीवन में शरीर की प्रतिरोधक क्षमता बढ़ाने वाली प्राकृतिक चीजों जैसे आंवला, गिलोय, एलोवेरा, कालीमिर्च, लौंग, दालचीनी, अदरक, तुलसीपत्ता, हल्दी, दूध, दही आदि का प्रयोग सामान्य बात है।

हर भारतीय जानता है कि जीभ का स्वाद बाजार से बीमारियों को बुलाता है। उसे घर में बनी चीजें ज्यादा पसंद आती हैं, इसलिये उसके घर में बाजार से आने वाली गंदगी कम रहती है। जिंदगी जब हमारी है, तब इसे बचाने और ठीक से जीने का फैसला भी हमें ही लेना चाहिये ताकि हम बहुत सी बीमारियों से बचे रह सकें।

हर व्यक्ति ने इस महामारी के दौरान अनुभव किया कि बीमारी का प्रमुख कारण भीड़भाड़ और गंदगी है। भीड़भाड़ वाली जगहों से ही संक्रमण की शुरुआत होती है, दूषित हवा इसका प्रमुख कारण है और हमारी सांसों के द्वारा यह हमारे अंदर आती है। खराब सफाई व्यवस्था, गंदा पानी, गंदा भोजन, गंदे बर्तन, और हमारे गंदे हाथ संक्रमण के वाहक हैं।

हर बड़ी घटनाओं ने विश्व के भौगोलिक और सामरिक इतिहास को बदलते देखा है। पहले और दूसरे विश्वयुद्ध के बाद साम्राज्यवाद और उपनिवेशवाद खत्म हुआ। अमेरिका और रूस के मध्य चले शीतयुद्ध ने दुनिया को पूंजीवाद व साम्यवाद जैसे दो धड़ों में बांट दिया और गुटनिरपेक्षवाद का जन्म हुआ। एक घटना के कारण ही दूसरी घटना घटती है। सीमाहीन विश्व से मानवता अब उस ओर बढ़ रही है, जहां सरहदें हमारे दरवाजों तक आ गयी हैं।

भारत ने जितनी अच्छी व्यवस्था अपने नागरिकों को इस महामारी से बचाने के लिये की, उतनी अच्छी व्यवस्था विश्व के किसी अन्य राष्ट्र ने नहीं किया। भारतीय व्यवस्था आज समस्त विश्व के लिये एक मार्गदर्शक बन गयी है। चाहें एक राज्य से दूसरे राज्य में मजदूरों व विद्यार्थियों को ले जाना हो, विदेशों में फंसे भारतीयों को अपने देश में वापिस लाना हो, अथवा देश के एक भाग से दूसरे भागों में सामान्य जरूरत की चीजों को भेजना हो, भारत ने बहुत ही अच्छे तरीके से अपनी जिम्मेदारी निभायी है।

वैश्विक जिम्मेदारी निभाते हुये भारत ने दवायें, स्वास्थ्य से जुड़ी सामग्री, डाक्टर, स्वास्थ्य कर्मियों की टीम, तथा अन्य जरूरत की चीजों को कई जरूरतमंद देशों को भेजा है। भारत का हमेशा से मानना रहा है कि भारत की प्रगति विश्व की प्रगति में सहायक होगी और उसका हर कार्य मानवता की सेवा के लिये है।

प्रतिदिन गृहमंत्रालय, स्वास्थ्य विभाग, और भारतीय आयुर्विज्ञान अनुसंधान परिषद ने देश को महामारी से जुड़ी हर छोटी से छोटी बातें बताकर दिखा दिया कि विश्व को नेतृत्व देने तथा किसी भी परिस्थिति से निबटने की क्षमता आज भी विश्व में भारत के पास ही है।

इस क्षमता के पीछे का सिद्धांत है कि हर भारतीय दिल से काम करता है, उसके पास दृढ़ इच्छाशक्ति होती है, वह व्यक्ति को कम और देश को ज्यादा महत्वपूर्ण मानता है, सफल होने के लिये अनवरत प्रयास करता है, और अपनी सफलता को अपने देश की सफलता मानता है।

आज विश्व का हर छोटा-बड़ा देश यह मानने को विवश है कि भारत ही विश्व में एकमात्र ऐसा देश है जो वैश्विक नेतृत्व के लिये सबसे उपयुक्त है क्योंकि मानवीय कार्य करते समय एक मानव से दूसरे मानव में न तो कोई भेदभाव करता है और न ही अपना कोई स्वार्थ रखता है।

भारतीय सेना और पुलिस द्वारा स्वास्थ्य सेवाओं में लगे हुये लोगों को सम्मान देने के लिये उन पर फूल बरसाना सामान्य बात नहीं है। यह आभार दिखाने का तरीका बताता है कि हर एक भारतीय संस्थान

कैसे एक दूसरे के पूरक बनकर इस महामारी में एक साथ खड़े हैं। विश्व को भारत का संदेश स्पष्ट है कि हमारा अनुसरण करो और एक होकर महामारी से निपटो।

ज्ञान विज्ञान सरिता परिवार राष्ट्र के प्रति अपने दायित्व के तहत सभी पाठकों से अनुरोध करता है कि वे सरकार और डॉक्टरों की सलाह के अनुसार अगर संभव है तो अपने घरों पर रहें, जब तक बाहर जाना बहुत जरूरी न हो, बाहर निकलते समय दो गज़ दूरी लोगों से बनाकर रखें और चेहरे पर मास्क पहनना न भूलें। सावधानी हमेशा उपचार से अच्छा होती है।

जय भारत !

—00—

CORONA virus has become a global disaster. Though it is stated to have originated in China, the most populous country, yet, it has been the FIRST to contain it.

How China could do it?

It is important for us to learn from China.

They firmly implemented shutdown, without exception. China has a different kind of socio-political system, to be able to do that.

In a democracy like ours, for the success of such shutdown, people's participation is a must. It requires to respect need of survival and coexistence above personal, social, geographical, communal and political preferences.

It is a time for all of us to know, think, introspect and decide upon priority between coexistence, and personal liberty vis-à-vis human rights. We need to ask ourselves - what for are the human rights?

Let us be honest and judicious about the priority and its implementation. Let us exercise patience to bear order of the day unambiguously.

Instantly, at times curtailing human liberties may appear to be cruelty. But, such a cruelty if self-inflicted, brings home altogether a different experience. It is vouched from first-hand realizations that such self-impositions build a kind of resilience and a self-discipline, necessary to accomplish tasks which are apparently impossible. It helps to reap thrill of survival, and an ability to grow in tougher times.

Without this, all the talks of human liberty may turn out to be only cosmetic.

Let us stay safe, impose self-restrictions and collectively emerge as victorious nation.

It is time to patiently and bravely capitalize this disaster, like any other challenge, as an opportunity to carve better times ahead all human beings...

May GOD bless us all...

—00—

Humanity is acquiring all the right technology for all the wrong reasons.

- *R. Buckminster Fuller*

—00—

Isaac Newton discovered gravity while in
Quarantine during Plague Epidemic



Isolation is good for creative ideas. So use
that time wisely .

Be Like Newton. Seek The Truth !

—00—

Very relevant when globally, we are fighting to survive out of CORONA

Never let crisis go to waste

- *Winston Churchill*

—00—

INVITATION FOR CONTRIBUTION OF ARTICLES

Your contribution in the form of an article, story poem or a narration of real life experience is of immense value to our students, the target audience, and elite readers of this Quarterly monthly e-Bulletin **Gyan-Vigyan Sarita: शिक्षा**, and thus create a visibility of the concerns of this initiative. It gives target students a feel that you care for them, and they are anxiously awaiting to get benefitted by your contributions. We request you to please feel free to send your creation, by 20th of each month to enable us to incorporate your contribution in next bulletin, subhashjoshi2107@gmail.com.

We will be pleased to have your association in taking forward path our plans as under-

- With the the release of 1st Monthly e-Bulletin in its consecutive Fourth Year, we are gearing up for next Monthly e-Bulletin **Gyan-Vigyan Sarita: शिक्षा** due on 1st of ensuing month.
- This cycle of monthly supplement e-Bulletin **Gyan-Vigyan Sarita: शिक्षा** is aimed to continue endlessly, till we get your **तन** and **मन** support in this sefless educational initiatice to groom competence to compete among deprived children.

Formatting Guidelines: (a) Paper Size A4, (b) Fonts: Times Roman (English), Nirmala UI (Hindi), (c) Font Size Title/Author Name/Text: 14pt/12pt/10 pt (d) Margins: top/bottom/left/right – 1”/1”/0.4”/0.4”, (e) Photoprofile of author – In 4-5 lines with mail ID and Photo. We will be pleased to provide softcopy of template of an article, in MS Word to the author on advise.

We believe that this e-Bulletins shall make it possible for our esteemed contributors to make its contents rich in value, diversity and based on their ground level work and/or experiences.

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We have learnt that LIFE is neither fast nor sudden leaps;

It grows gradually and sreadily through pits and rises.

We have learnt on every fall, more was needed from us;

Irrespective of how others were.

We have learnt that when tide is against, swim hardest to keep moving ahead;

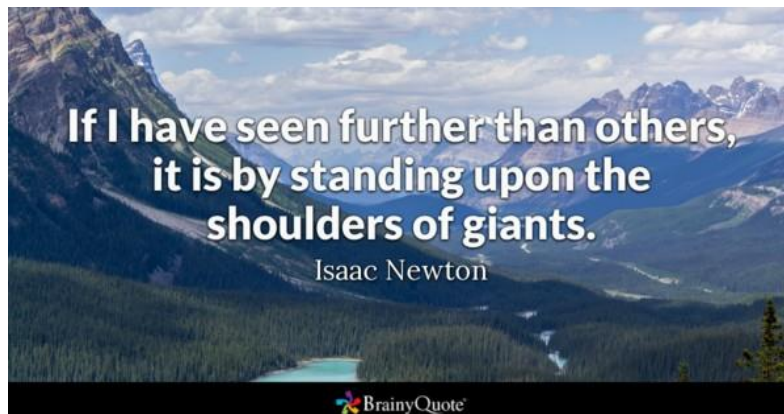
When in favour swim fastest to create a reserve in case of contingencies.

We have also learnt that reasons are in abundance to justify losses,

But there is only ONE reason to do good beyond self.

LIFE is MUST for sustainable coexistence.

—00—





Coordinator's View

Compromise or Choice?

*Growth in human civilization has built a myriad of intelligence, where plain admission of fact and living with that is last option. More intelligent a person is, greater is the strength of argument in support of his actions with flavour of pragmatism. These pleas are showcased as either compromise or choice. Visibility of this fact has become more clear in defense advanced by many in support of their actions leading to spread of Covid-19. The rate at which this pandemic is swallowing the world population, a million-dollar question needs consideration - is it important for a person to pursue his faith, arguments and personal priorities or to save life from pandemic? Can we not distance socially while maintaining social fabric? **Are compromise and choice the same or different?***

The rate at which Covid-19 is galloping, it has put forth complex and multi-dimensional challenges. The first and foremost challenge is - *can I remain safe while making others unsafe?* Straight answer to this in the prevalent socio-economic order is Not! Next, we as a nation can become self-dependent considering our size of population, land and diversity. *Can it be total self-dependence?* Today right from amenities to information, everything is flowing across the globe so deeply and extensively that concept of nation is a matter of geographical, cultural and political identity. Frequency of epidemics and consequent human loss has created a rethinking on life post Covid-19. Economics of scale demanding technological developments has created multiple effects. Availability, accessibility and affordability of products and services has improved level of physical comfort. Mega size production hubs, cities, residential complexes, transport infrastructure, have grown. They are supported by migrant labourers, who have conglomerated around all such big complexes. These migrated populations are engaged in functions that support luxury of persons occupying these complexes. In spare time they operate support services or as street vendors and hawkers, based upon their skills. Business thinkers are evolving theories about size, survival and efficacies of the business model of the migrant population. This model is also compared with corporate world. This paradigm is just a tip of the ice berg that is presented in catchy phrases. As a matter of fact, none of these migrant labourer know their destination before leaving their homes. Post migration they are unaware of the source of their product and or service they are vending and so also its cost and price; all that they know about it is their margin in the price, daily turnover and survival needs. As they gradually settle down in the model, they become an integral part of the supply chain, elevated in responsibility based on their ability. It is in no way different than that in corporate world. The only difference between the two is that corporate world is formal, organized and visible; it contributes to the economy of the country through direct taxes. While, the world around the corporate is an informal structure and hence outside tax bracket. Scale of persons' engagement in the informal sector is so large that it has remained unaccountable and therefore attracting different kind of socialistic consideration.

These Management Gurus applaud malleability of this informal model across hour of the day, day of the week, week of the

month, months or season of the years. *Is it possible without definite supply-chain-management system?*

Thus, these theories are biased and silent on the crisis of retreat of migrant population amid Covid-19, and prospects of survival of Inc. world in absence of support functionaries, economic scenario on repatriation of migrated labourers. *Is this repatriation reversible or an irreversible? Is this change a compromise or a choice?*

Serenity Prayer "*God grant me the **serenity** to accept the things I cannot change; **courage** to change things I can; and **Wisdom** to know the difference*" contains a clue to various questions raised above and that would follow. Nature and life are dynamic processes and changes from time to time. They are inevitable. The change becomes an accelerated compulsion whenever survival is at risk. These compulsions that create situations at times so turbulent that serenity, courage and wisdom are seldom drivers of change. At such points of time it is relevant to *appreciate the difference between Compromise and Choice*. **Compromise** is like a business deal where each stake holder tries settle at minimum loss proposition. The compromise so arrived at, is projected most profitable posture and it is presented as **Win-Win** situation in management parlance. Whereas **choice is selection of the alternatives**. Choice can be in two forms. *A choice under compulsion, where one has to opt one among the choices within a boundary is called as reactive choice*. In other form, *choice is a result of an evolutionary thought process. It is boundary less with scope within one's creativity and is called proactive choice*.

Proactive Choice evolves out of observations, their correlation, analysis of effects of each observation, evolving alternatives to optimize the effects, selection of an alternative which is economical, viable, feasible and sustainable for the larger good. Thus proactive choice is just not as a ritual to recite Serenity Prayer, rather it is a matter of walk-the-talk. Such choices are neither a commodity nor a commercial opportunity; they are result of thought process groomed in individuals as an integral part of education.

Any choice has time frame. Likewise, any choice made for an immediate respite during disaster is a **short-term choice** viz. food relief, shelter, repatriation, medical support etc. Second is **medium term choice** where in consideration is to support sustenance of life until calamity passes off. In prevalent context when Corina appears to stay longer and it is essential to prepare

as a nation to live with Corona while sustaining minimum disruption in socio-economics. The third is **long term choice**, where calamity is as an opportunity to bring in changes in a socio-economic-political order. Every nation has many plans on the anvil, but they remain unforged in a democracy. It is more true where polity is more demanding on rights than their duties and responsibilities towards nation.

There have been efforts in last few decades to decentralize state capitals, and various hubs viz. business, educational, cultural, executive, judiciary, administrative etc. But, such initiatives, in normal circumstances, meet enormous resistance. Basic reason of the resistance is inherent inertia of the prominent people to consolidate and retain their belonging, power and sphere of influence. Such resistances cause a severe retardation in pace of such initiatives.

Prevalent pandemic has threatened level of comfort of all forms in corporate world. Most of them have settled to live with minimal support and needs. This has created a scare among migrant labourers about their sustenance, causing their mass repatriation to their respective native places.

Immediate future with multiple requirements to stay safe demand maintaining socio-economic cycle while distancing socially. Though this repatriation is under compulsion; yet its scale whether voluntary or a sponsored, poses an urgency on the government to evolve a long-term choice. It is an invaluable opportunity to integrate their skills into decentralized supply-chain. This will help to create employment at rural sector and thus reinforce micro-economic activities.

There is another school of thought of **Positive Thinkers**, who believe in allowing happening to take their course with a theist belief that everything will get set right; it is escapism and is termed as **passive positivity**. It needs to be remembered that in society and nation every person and citizen is equal stake holder. Therefore, positivity does not mean only to think and act optimistically. It is essential for every citizen to be surveillant to the happenings around, and take remedial measures, within framework of law, against anything that is found to be going wrong; it is called **Pro-active Positivity**; it is an essential requirement for an orderly state. This is also called **social policing**.

As against this negativity is about either finding fault in everything or derive sadistic pleasure in derailing anything that is in an orderly manner; it is called **active negativity**. It is either a personality aberration or discomfort in a proposition being advanced. It is also observed that for an inadvertent wrong act of happening, fear of being held guilty prompts a person to resort to the policy 'offense is best defense'. Such negativity is **reactive negativity**. It is also observed that sometimes needy persons, who are naïve to cause, are allured to oppose certain propositions; such acts are called **sponsored negativity**.

We owe society, in its present form, to those who maintained **serenity** in times of crisis and had wisdom to judge between compromise and choice, and **courage** to pursue their choice for

the larger good. They are part of the solution; while, rest were swept away into a forgotten history. Solutions thus evolved are choices and not compromises. Every problem is born with a solution alongside; all that is needed is to discover the solution and customize it. Comparison of proactive choices on scale of positivity or negativity is irrational.

Choices in Education: Education in school of life leading to survival of the fittest, based on success stories of a few from informal systems, requires primarily every individual to be subjected challenges of survival. Proponents of such system needs to answer - *is it desirable to wait until a person reacts with survival instinct? Are such circumstances indicator of presence of a welfare state? Does it demand change in educational infrastructure? Are not these advocates creation of education that they received in the prevalent systems?* None of these questions has assertive answer. The basic reason behind this is that education is an institutionalized process to groom children of today into citizens of tomorrow with wisdom of making right choices and making them ground realities. Making education a commercial commodity is a compromise. It jeopardizes the basic objective of education and reduces our beloved children into run-of-the-mill.

This article is fraught with fear of education taking rear seat amidst short-term and medium-term compulsions in a world risked with pandemic. Therefore, while raising our concerns, we continue our endeavor to groom competence to compete among children deprived geographically, socially, economically, culturally or any other reason without discrimination. We have been continuing, since last five years, through **Interactive Online Mentoring Session (IOMS)**, with a sense of **Personal Social Responsibility (PSR)** in a **non-organizational, non-remunerative, non-commercial and non-political manner**. Prevalent disaster has established inevitability of educational model. This model possesses has been mooted by four persons in totally selfless manner, three of them are senior citizens. a pedestal of four persons.

Conclusions: Evolution of IOMS has taken place in pursuit of inspiration driven with PSR to assimilate deprived children in main stream through education. It started eight years ago in Chalk-N-Talk mode. It is a **considered choice** with a long-term vision. long and **not a compromise** to make good the old age living.

We are committed to pursue it until our last breadth wherever internet connectivity is available, within realms of our physical capacity. It is an opportunity for elite,s especially senior citizens to know about the initiative, customize it their potential and constraints, wherever necessary. It welcomes all who are prepared to complement collectively or pursue it in their own way. But, there are two requests – (1) Please pursue the cause, to the extent possible with PSR; it will create a legacy for our beloved children to feel proud of, while staying safe. (2) Please do not commercialize the proposition; future belongs to our beloved descendants who are prepared to coexist.

An Appeal: for Interactive Online Mentoring Session (IOMS) at your establishment

By Gyan Vigyan Sarita – A non-organizational educational initiative

Philosophy: Socio-economic reform through education with **Personal Social Responsibility (PSR)** in a non-organizational, non-remunerative, non-commercial and non-political manner.

Objective: Groom competence to Compete among un-/under-privileged children from 9th-12th in Maths, Physics and Chemistry, leading to IIT-JEE.

Financial Model: Zero-&-Fund-Zero-Asset (ZFZA). It calls for promoters and facilitators to provide infrastructure for use to the extent they feel it is neither abused nor there is a breach of trust. And, reimbursement of operational expenses, as and when they arise, to the initiative

Operation:

- a. **Mode:** [Interactive Online Mentoring Sessions \(IOMS\)](#) since July'16, which has been recently switched over to A-VIEW, web-conferencing S/w, with connectivity upto 5 Learning Centers, with One Mentoring Center.
- b. **Participation:** Voluntary and Non-remunerative, Non-Commercial and Non-Political

Involvement:

- a. **Promoter –**
 - i. Initiate a Learning Center,
 - ii. Sponsor a Mentor who is willing to join on certain terms,
 - iii. Sponsor cost of operation and up-gradation of infrastructure to voluntary mentors,
- b. **Facilitator –**
 - i. Provide space and infrastructure for **Interactive Online Mentoring Sessions (IOMS)**. Most of it is generally available, and may need marginal add-on,

- ii. Garner support of elite persons to act as coordinators at the Learning Centre.
- c. **Participator –**
 - i. As a Mentor,
 - ii. As a Coordinator,
 - iii. Operational support
 - iv. E-Bulletin and Website promotion for increasing its depth and width across target students

Background: *The initiative had its offing in May'12, when its coordinator, a non-teacher by profession, soon after submission of Ph.D. Thesis in 2012, at one of the IITs, under taken after retirement got inspired to mentor unprivileged students.*

The endeavour started with Chalk-N-Talk mode of mentoring unprivileged students starting from class 9th upto 12th. Since then it has gone through many ground level experiences and in July'16 it was upgraded to IOMS, a philosophy in action to reachout to more number of deprived students. Currently regular sessions of IOMS are held regularly for students of class 9th and above at few Learning Centres. Efforts are being made to integrate more learning centers and mentors to diversify its scope and utilize our full capacity.

*It is a small group of Four persons including **Prof. SB Dhar**, Alumnus-IIT Kanpur, **Shri Shailendra Parolkar**, Alumnus-IIT Kharagpur, settled at Texas, US and **Smt. Kumud Bala**, Retd. Principal, Govt. School Haryana. More details of the initiative are available on our [website](#) and operational aspects of can be online accessed at [IOMS](#).*

Actions Requested: *May please like to ponder upon this initiative. **Queries**, if any, are heartily welcome. We would welcome your collective complementing in any of the areas listed above at **Involvement**, to make the mission more purposeful and reachable to target children.*

Contact: Dr. Subhash Kumar Joshi, **Coordinator**, Gyan Vigyan Sarita.

Address: #2487, Mahagun Moderne, Sector-78, NOIDA, UP– 201309, (M):+91-9711061199,

e-Mail ID: subhashjoshi2107@gmail.com, **Website:** <http://www.gyanvigyansarita.in>

अंदाज ए बयां

आलस्य का साम्राज्य और उसके बाशिन्दे

समीर लाल 'समीर'

शनिवार की अलसाई सुबह.

सोचा था आज सुबह उठकर कुछ लिखूँगा. ऐसा लिखूँगा, वैसा लिखूँगा. जाने क्या क्या विचार आते रहे थे रात सोने से पूर्व. शायद पूरी सोच को कागज पर उतारने लग जाऊँ तो एक रोचक उपन्यास से कम तो क्या वृतांत होगा.

मगर इधर कुछ समय से वक्त की कमी ने ऐसा हाथ थामा है कि मौका ही नहीं लगता कुछ लिखने के लिए. सोच, भाव, विचार सब भीतर ही ठहरे रह जाते हैं, शब्द रूप लेने को तड़पते. इसी तड़पन में न जाने कितने विचार दम तोड़ देते हैं और न जाने कितने खो जाते हैं इस उमड़ती घुमड़ती भीड़ में.

किसी ने प्रश्न उठाया था तो बताना भी फर्ज समझता हूँ कि ऐसा नहीं है कि विचार या भाव चुक गये हों. उनका तो व्यस्तता के संग चोली दामन का साथ है. लबलबा कर भावों का समुन्द्र भरा है मगर उन्हें सहेज कर करीने से शब्दों का जामा पहनाना- एकांत मांगता है. एक स्थिरता मांगता है. समय मांगता है. एकाग्रता मांगता है. इनमें से एक की भी कमी बर्दाश्त नहीं कर पाता एक सधा आलेख या कहानी या फिर कविता.

लेते लेते गाना सुन रहा हूँ. फरीदा गा रही है:

सारी दुनिया के रंज और गम देकर

मुस्कराने की बात करते हो...

दिल जलाने की बात करते हो

आशियाने की बात करते हो!!!

और ईमेल में पत्रों का अंबार लगा याद आता है- चाहने वाले, यार, दोस्त पूछ रहे हैं नित- क्या बात है आजकल कुछ नया नहीं लिख रहे हो? सब ठीक तो है?

क्या जबाब दूँ?

समय की कमी का बहाना कब तक दोहराऊँ?

खाना खाना, नहाना, सोना तो बंद नहीं हुआ. सांस लेना और छोड़ना भी पूर्ववत् जारी है तो क्या वक्त की कमी की मार खाने को सिर्फ लेखन ही मिला. वक्त की कमी या फिर इसे आलस्य कहूँ. मौसमी आलस्य. बदली बन कर बीच बीच में छाता रहता है. कभी भावों का अंधड़ आयेगा.

आलस्य के बादल छटेंगे और शायद तब लेखन उतर आये कागज पर सज संवर कर.

यानि एक अनुरूप मौसम का इन्तजार कलम उठाने से पहले. मानो इन्तजार हो कि एक टेबल लग जाये, एक टेबल लैम्प जल जाये, कुछ खाली सफेद पन्ने जमा दिये जायें तो लेखन शुरू हो. बस सब कुछ स्वतः हो जाये और स्वयं कोई प्रयास न करना पड़े. स्थितियों को अनुकूल बनाने के लिए. यह तो एक लेखक का धर्म न हुआ. यह अनुचित है.

निश्चित ही खुद को व्यवस्थित करना होगा. समय का प्रबंधन नये परिवेश में पुनः एक नये ढाँचे के अनुरूप करना होगा. कुछ सप्रयास बदलना होगा खुद को. एक धर्म अपनाया है तो उसका पालन करना होगा. यूँ ही अव्यवधित, बिना किसी मनोयोग के, बिना किसी उचित प्रयोजन के कब तक चला जा सकता है.

यूँ तो पठन कार्य भी टला हुआ था किन्तु इधर कुछ विश्व प्रसिद्ध लेखकों की किताबें उठा ली हैं बहुत उम्मीद से. शायद उनका पठन पुनः कुछ उकसाये नया रच डालने को. यूँ भी लेखन में पठन की अनिवार्यता को मैं शुरू से अहम दर्जा देता रहा हूँ.

मेरा सदा ही मानना रहा है कि एक पंक्ति लेखन की पात्रता ही तब हासिल होती है, जब आप १०० पढ़ चुके हों. वरना तो हमेशा एकरस और उथला सा ही लेखन शेष रहेगा. कोई सार न होगा उस लेखन का.

व्यस्त जीवन शैली के बीच वृहद पठन, संवेदनशीलता, खुली मानसिकता, जागरूक नजरें और सचेत कान- ये ही आवश्यक अंग हैं बेहतर लेखन के. शैली तो आपकी खुद की ही होती है और भाषा- सभी भाषाओं की अपनी अहमियत है. तो पठन को भी संकीर्णता से परे विभिन्न भाषाओं के लेखकों के पास तक ले जाना होगा.

एक निर्देशन है स्वयं के लिए- सप्रयास इसमें ढलना होगा. देखें, कहाँ तक पहुँचते हैं.

फरीदा का गायन अब भी जारी है:

हमको अपनी खबर नहीं यारों

तुम जमाने की बात करते हो...

दिल जलाने की बात करते हो

आशियाने की बात करते हो!!!



लोकप्रिय चिट्ठाकार समीर लाल व्यवसाय से चार्टर्ड एकाउंटेंट हैं। आजकल वे कैनेडा में रहते हैं। उन्होंने कहानी लिखना पाँचवीं कक्षा में ही शुरू कर दिया था। आप कविता, गज़ल, व्यंग्य, कहानी, लघु कथा आदि अनेकों विधाओं में दखल रखते हैं। भारत के अलावा कनाडा और अमेरिका में मंच से कई बार अपनी प्रस्तुति कर चुके हैं। आपका ब्लॉग “उड़नतश्तरी” हिन्दी ब्लॉगजगत में एक लोकप्रिय नाम है।

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Ayurveda- Health Care

Haritaki (Terminalis Chebula)

Dr Sangeeta Pahuja

In Ayurveda Haritaki is well known for balancing the Tridoshas (Vata-Pitta-Kapha). According to folklore, the first Haritaki was sprouted after a drop of Amrit, the eternal nectar, dropped from the heaven on the earth. So it is well-known as **DIVINE FRUIT**.

Haritaki has excellent properties to pacify vata. Therefore has been used since ages to treat all vatavyadhi (caused by vata imbalance). Specifically those related to large intestine.

People who are tend to vata type digestive imbalance such as Gas, bloating, variable appetite; vishamagni can be treated with Haritaki to balance vata.

Haritaki contains five of the six tastes.

- **Sweet and sour** taste help to pacify vata.
- **Sweet, bitter and astringent** taste of Haritaki helps to pacify pitta.
- **Astringent, bitter and pungent** taste helps to pacify kapha.

These properties make it Tridoshashamak.

Haritaki has Rasayan and Aphrodisiac properties. It has great effect on Shukra Dhatu (the reproductive tissue layer). Therefore it is excellent herb for promoting sexual health and well-being.

Haritaki increases Prana, the super fine essence of vata. So it increases energy, intelligence and awareness.

It can be used to improve the emotional health and to alleviate grief and sadness.

Haritaki prevent hair loss and dandruff by applying herbal Haritaki oil in the scalp.

Haritaki has antibacterial, Anti-viral anti-diabetic, antioxidant and healing properties.

It has laxative, purgative and restorative properties and promotes longevity.

It's a source of vitamin C, manganese, selenium, Potassium, Iron and copper.

Haritaki has been found very helpful in the pain management in arthritic patients.

Haritaki aids digestion. It strengthens the metabolic system and remove the toxins from the body and prevent Acidity, constipation and ulcer.

It has been used since ages in Ayurveda for stabilizing blood glucose levels.

Haritaki cures swollen gums. Using the extract of this herb as a mouthwash helps prevent cavities.

It is excellent anti allergic. In case of allergic reaction, wash the affected area with Haritaki for immediate relief.

Hot decoction of Haritaki can be helpful to eradicate all types of fungal infections.

All in all the consumption on regular basis enhances the ability of five senses.

Suggested Haritaki Adjuvant in different seasons are:

Varsha Ritu (Monsoon)

- Rocksalt (saindha namak)
- Sharad Ritu (Desi Khand) Sharkara

Hemant Ritu (Early winter)

- Sonth (Dry Ginger)

Shishir Ritu (Winter)

- Pippali (long pepper powder)

Vasant Ritu (Spring)

- Honey

Grishm Ritu (Summer)

- Fresh Jaggery.

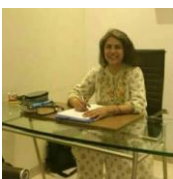
Suggested Adjuvant according to Dosha imbalance:

- **To pacify Vata:** Take with Ghee
- **To pacify Pitta:** Take with sugar
- **To pacify Kapha:** Take with Rock salt

Well said, Haritaki is indeed a Divine Fruit!



Follow Ayurveda and stay healthy.



Author is an Ayurvedic Medical Practitioner. She did B.A.M.S. from M.D. University, Rohtak. She has consultation centres at Delhi and Noida. She is keenly interested in spiritual, women and social developmental activities. Contact No.: 9953967901,

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युद्ध के वानर-भालू

मुकेश आनंद

महामारी एक महायुद्ध है,
इसमें राम भी हैं, रावण भी,
स्वर्ण मृग भी आएगा,
सीता हरण भी होगा,
विभीषण राजा भी बनेगा।

ये कलयुग की कथा है,
पर रामलीला कहीं भी हो,
मारा तो रावण ही जाएगा,
राज तिलक तो राम का ही होगा।
कोई जीतेगा, कोई हारेगा।

ज्यादा उम्मीद मत रखो,
तुम वानर-भालू और पैदल सैनिक हो,
तुम्हारा काम है लड़ना और मरना,
जय जयकार करना,
यहां अमृत वर्षा नहीं होती।

चुनाव तो है नहीं, कि होगी आवभगत,
युद्ध खत्म होने तक,
लड़ते रहो, चलते रहो,
जो जिंदा बचेगा,
वो घर भी पहुंच जाएगा।



कविअधिवक्ता एवं सामाजिक कार्यकर्ता हैं।
सामाजिक विषयों पर पाठन, चिंतन –मनन,
लेखन एवं उन पर कार्यान्वयन उनकी अभिरुचि
है।
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बचपन

भावना मिश्रा

फिर लौट आया बचपन
वो शरारत भरी बातें।

वो यादें, वो नटखट इरादे
वो दादी की लोड़ी, वो नानी की कहानी।

वो छुपना, वो भागना
वो लड़ना, वो डाँटे सुनना।

वो खाने में नखरे
वो दूध पीने में नाटक।

वो तितलियों के पीछे भागना,
वो कोयल की कू कू पे मेरा चहकना।

वो पेड़ों पे चढ़ना,
वो पत्तों और शाखाओं के पीछे छुपना।

वो पानी में खेलना,
वो हलहड़ अदाएँ।

वो माँ के हाथों से खाना
वो पापा के खोद में सर रखना

कितनी प्यारी है वो खट्टी-मीठी यादें
वो बचपन की यादें, वो बचपन की बातें।

कभी भूल सकती नहीं मैं
वो बचपन प्यारी, नटखट यादें।



लेखिका कला संकाय से स्नातक तथा एक
गृहणी हैं। वे अपने पुत्र मनन और पुत्री नव्या के
साथ अपने परिवार तथा बुजुर्गों की सेवा का आनंद
लेती हैं। संगीत (गायन), नृत्य एवं भ्रमण इनके
शौक हैं।
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Covid 19: A Contrarian View

Prakash Kale

Presently a fear of the new coronavirus has all of us petrified – but it is important to look at the numbers as well progress and likely demise in (historical and other disease/reasons) context and ease our impression of the virus's lethality. The more civilized human became, building cities and forging trade routes to connect with other cities, and waging wars with them, the more likely pandemics became. So pandemics are part and parcel of our progress. The earliest recorded pandemic happened during the Peloponnesian War in 430 B.C. (in Athens). **As much as two-thirds of the world population died.** The latest (before Covid-19) Spanish Flu-1918 (the avian-borne flu, Flu outbreak happened in Madrid in the spring of 1918 led to the pandemic being called the “Spanish flu”) caused **50 million deaths worldwide (18 million in India)**. The flu disappeared in the summer of 1919 when most of the infected had either developed immunities or died. In between (1918 and 2020), world also experienced, Asian flu-1957, HIV/AIDS-1981, and SARS-2003 some of which were **more lethal than Covid 19** but limited in geographical spread. Further, **ten million** people die each year in India alone, most of them of old age, and **often with pneumonia as a terminal event**. The seasonal flu or influenza also mutates every year and spreads around the planet and 290,000 to 650,000 die worldwide every year. Due to Covid 19, in Italy as elsewhere, most deaths have been recorded among elderly people with a coexisting disease. Remember casualties in man-made Wars like WW2 in which millions of prisoners were killed in Gas Chamber alone. At this point, coronavirus is not much worse than the annual flu. We should get back to normal life. Else the economic debilitation could kill many people, especially in less rich countries like India.

Accepting that it has stopped everything (economically), we should thank God that it has not destroyed anything like, what WAR, Earthquake or Tsunami would have destroyed. Thank God that India is not alone in this crisis, but whole world is affected and more badly; so relatively we are better off. Take it is a course correction call given by nature. It may be good idea that we have paused on wrong developmental path. We should be happy that it has given us clean slate or ground zero to reconstruct our home/society/country afresh without baggage or legacy of past. While restarting economy, now we have opportunity to redraw and focus on essentials and disregard non-essentials. Individually also, we may be able to understand what is essential and what is peripheral in life, what is life and what is life style consumption. Further, it will definitely advance progress of new technology and management practices in our economic life, which otherwise (due to

inertia) were hard to be adopted. It may force us to shed some aberrations that have crept in our religious or social practices. It has given correctly right signal of complete unity of humanity and nature. Will we take these signals seriously and correct ourselves? Lastly, if it is **Fall** (autumn) can **Spring** be far away.

As written above, historically, fact is, after every crisis civilisation has moved forward and changed for better. At the end of World War II (manmade crisis and destruction) a global framework based on shared values and interdependence evolved and resulted in a liberal international order. However, in the developed world last four decades of neoliberalism left public education, public health and public social infrastructure in disarray. In the developing world, a welfare state is still a distant dream. We are regularly told that the state has a lesser role than the market in setting these problems right. Thus more than the loss (caused by Covid 19) above, there is/was loss caused by present laws and practices. There was a need or justification for a deeper intervention, a rewriting of old rules and writing of new rules in social, economic and political system that could not be carried out in normal times. Covid 19 has blunted the confidence and hyper-individualism, free market etc. that has characterised the 21st century thus far. This pause can be a good starting point for required correction. Now is the time that relative roles of the state and the market are viewed fundamentally differently. **The market will have to be socially regulated.** There is strong need of the reinstatement of strong social security measures in the whole world.

Before moving further let us understand what has been lost, ***what is intrinsic loss from Covid -19?*** It is nil. What is Economic or Accounting Loss too much? *What is the difference between two?* One litre of petrol will always give certain number of calories (intrinsic) on ignition; this value will never change irrespective of its continuously changing economic value which depends upon demand and supply, availability of alternatives and so on. In other words, economic value is the value which goods or services are able to receive in exchange. Now, ***what has happened in present crisis?*** This exchange of goods and service and there by flow of money has stopped. **So we feel certain loss. What has stopped during Covid- 19?** Man's external activity, transaction activity or economic activity, while nature has continued working better and uninterrupted. Original source of energy Sun has not stopped working. Vegetation, including agriculture has not been affected rather it is growing well (Rabi crop is best this year), and functioning of associated activities has not been stopped by

government. Functioning of government itself has not stopped. In factories raw material as well as finished good has not been destroyed. All that has happened is value addition through production activities has been delayed.

Even then let's us accept output is lost, so the consumption too. And having admitted there is loss, *what is this loss compared to such previous events, whether natural or manmade (written earlier)?* Within short time this economic or accounting loss can be easily recouped. This requires allowing 75% depreciation instead of 100 % as in normal year. This way much of the visible loss on balance sheet will vanish. If there is loss of 90 day's production, the same can be compensated within maximum next 9 months by 33 % extra work. Many of states already have passed law amending labour law to allow workers working 12 hours in a shift instead of present 8 hours. *What is significance of this loss in time frame in the life of a Nation?* Negligible. **More important is willingness and determination to move forward. If that is lost (due to Covid 19) everything is lost.**

Now coming to opportunities Covid 19 has given us for correction, I learnt in Physics that maximum strength of a chain (the weight it can lift without breaking self) is the strength of weakest connected pieces, called links. **This applies to societies and nations too.** Its strength does not lie in wealthiest or talented strata of society but, that of what is the condition of lowest strata. **And Covid -19 has forced us to look at it and given us opportunity to strengthen it.** More than 90% of the country's workforce and 87 % of firms representing 21% of total turnover is estimated to be in the informal sector and outside both the tax and social security nets. Estimated 4 crore labour travel seasonally every year from rural areas to work in cities, farms or industrial areas. But, they are financially or socially not protected. To rectify it, government can work in two ways. First, government should make an effort to provide a social safety net and an initiative to make it easier for internal migrants to have a political voice (voting rights) and social rights, so that the city or metro where they serve feel that they are part and parcel of them and not the invisible outsiders. Some of such measures are implementation of **One Nation One Ration card**, portable voting cards, augment public health infrastructure, better arrangement of shelter etc. In short, in case of normal times and emergencies they have equal rights like any other citizen of city/ state where they are working. Secondly, the upside of this crisis is that it has given us an opportunity to realign our growth strategies and bring about structural changes in our policies that prioritise the poor and redress regional imbalances. After COVID-19 is put behind us, we ought to ease off our massive urban centres, which are a symbol of lop-sided development. We must think of alternative strategies to provide employment to them in their towns and villages, so as to prevent economic migration to the Urban

Agglomerates. We can plan cluster oriented economic activities whereby, production units as well as consumers are located in small- small geographical areas avoiding long dislocation of people and transportation of goods. This is against economics of scale in production which led to large capacity production hubs.

At micro level, for industries (especially PSU), in the field of strategic business planning or restructuring, this is God sent opportunity to start with clean slate. For example, now railway (who already completed years of pending maintenance work) can discard completely old time table and plan a fresh, number of trains, the route, the stoppages, and the fare and so on? It can properly reposition itself between air (long journey) and road (short journey) traffic. Railway can recalibrate freight and passenger train mix to maximise its gain. We can plan a fresh integrated economy based on our 130 cr people, without baggage of history.

Individually also, during lock down as a human it has taught us what is essential and what is peripheral in life. "Atta (wheat flour) will be always more important/ essential than "Data". For present generation, who has not seen something like 1966's famine, crowd at ration shop, PL 480 Red Wheat; instead they have seen prosperous India which evolved after 1991 liberation is a waking call from dream. Now they will **understand importance of saving, proper prioritisation of expenses and so o. Thus Covid-19 will have served a good purpose for them.**

From attitude point of view, Covid 19 forced us to realise that in spite of manmade division of nation, religion and class etc. we as human being are one without any differentiation. This crisis has reminded how interconnected our lives are, and how fragile these taboos are. We ignore the plight of others, especially the poorer and the underprivileged, at our own direct peril. This should also be taken as opportunity to correct aberration that has crept in our religious and social life. We can stop using religious and social gathering (including marriage function), which has turned out to be ugly show of wealth, strength in political rivalry or used for spreading hatred (instead of harmony) among different community and class. Religion must serve us in enhancing spiritual strength, self-purification and moral guide for society. It has shown that we all are sitting in single boat and we cannot shut our eyes if someone is drilling a hole in the boat. One hole anywhere in boat is sufficient to sink the whole boat. This is an important and one positive lesson out of this unprecedented crisis — **we sink or swim together.**

Further, in spite of all superiority shown by human over nature and other co-habitat of this earth; it is proved human being is helpless against nature; it is only **a connecting point in whole biological chain without any privileges.** This experience should make men more compassionate **towards (each other and) other species?** It is important to

understand that when you disturb the ecosystem, these things will happen. When you keep destroying forests, there will be more animal-human contact and a higher probability of viruses in animals getting into human. In other matters also, we have evidence that due to man's activity ecosystem is degrading, glaciers are melting, and permafrost is melting. We don't know what's hidden under that and what will come out of these glaciers? God forbid! something unknown like Covid 19 can come out. Therefore, another important lesson in this, the lesson is that we should be taking care of our ecosystem; we should really be taking care of our world. **Hopefully, the crisis could bring a change in the way we treat our Mother Nature.** Already, due to non-activity of human being, photos of blue skies and transparent river water are being circulated on social media. The shutdown has brought air quality to acceptable levels even in Delhi (worst polluted city in India); presently residents of Jalandhar in the Punjab could see snow-capped Himalayas. We have seen the environment around us rejuvenate during the lockdown and animals at places where we would normally not expect them to be at. But such lock down cannot be a solution for nature to bloom. **We must develop a balanced economic model in which protection of environment find place.** In the field of urban planning, we can stop re-encroachment of footpath by hawkers, improve slum condition. As an industrial policy we need not allow restarting industries that discharge their pollutants in Ganga and other rivers.

Conclusion: *Historically, pandemics have been portals for dramatic change. The world will not be the same after*

COVID-19. Humanity will have to find newer ways of dealing with public health emergencies and how we model our economic transactions. In general changes will be across multiple levels. First, policymakers will possibly devote more resources for future epidemic prevention. Second, the shape and size of institutions and governments could change, along with their interactions with communities. Finally, the workplace will never be the same again. Perhaps important lessons would be on building strong community relationships. A blended model of work with different concentric circles of work from home, gig economy and formal work complementing each other would also be here to stay. This trend will accelerate and informal might become the new formal as citizens and businesses see the benefits.

For India, the Covid-19 crisis is a once-in-a-century change trigger. Covid-19 presents an opportunity to craft a new economic model, bridge rural-urban divide. A looming economic crisis triggered by the coronavirus pandemic is a chance for India to enact sweeping reforms to fix ailing sectors." India has a history of taking reform steps during periods of crisis. For example, in 1991-92, it freed the private sector from a myriad of government controls, deregulated financial markets, reduced import tariffs and opened up the economy to more foreign investment to avoid a balance of payments crisis. Hopefully, this otherwise unmitigated tragedy will help us see how weakened we have become as a society and will focus our politics on the critical economic and health care reforms we sorely need."



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***Who cares what am I or I do, as long as I am not either useful or dreadful.
Can I take first step to befriend other by complementing my usefulness,
for the larger good.***

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Education is not filling of a pail, but lighting of a fire.

- William Buttler Yates

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सही या गलत

विशाल सरीन

ज़िन्दगी की भी क्या थोड़ी है - एक पल में लगता है कि हर चीज़ के बारे में ज्ञान है मुझे, तो दुसरे ही पल इतना बेगाना कर देती है की जैसे कुछ भी नहीं पता इसके बारे में। जहा बड़े बजुर्गों के पास अनुभव का खज़ाना है तो वही कभी कभार छोटा बच्चा भी न भूलने वाली सीख दे जाता है।

अक्सर किसी के निर्णय को लेकर ऐसा लगता है कि क्यों इतना गलत किया इसने, फिर समय पाकर लगता है बहुत अच्छा किया, और अगर ऐसा नहीं करता तो न जाने कितनी बड़ी गलती होती।

अंग्रेजी में कहा जाता है कि Put yourself in someone else's shoes, जिससे ऐसा तय किया जा सके कि दुसरे ने उचित किया या नहीं। इससे इंसान सोच में पड़ जाता है जूते को लेकर। उस इंसान का जूता डालकर निष्कर्ष निकालने का प्रयास करता है जिसकी तरह सोचना चाहता है। और कभी सोचता है कि वो जूता तो मुझे फिट भी नहीं पड़ेगा।

लेकिन इसका असल मतलब है खुद को दुसरे के किरदार में ढालना और परिस्थितियों के हिसाब से आंकलन करना। जो कि उतना सरल नहीं जितना लगता है। इसको करने के लिए एक लिबास में रहकर विभिन्न भूमिका निभानी होगी।



उदाहरण के तौर पर कभी हमें खाने में कुछ बहुत स्वादिष्ट लगता है। परन्तु उसकी बनाने की विधि जानकर भी हम बिलकुल वैसा खाना नहीं बना पाते, तो किसी के किरदार को निभा पाना तो अत्यंत कठिन होगा।

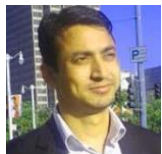
हर इंसान का जीवन का अपना अनुभव है और उसके अनुसार वो कभी जानबूझ कर गलत निर्णय नहीं लेता, यह तो परिस्थितिया और मुकदर है जो ज़िन्दगी की राहों में ऐसा अनचाहा मोड़ ला देते हैं जिसे दुनिया पसंद नहीं करती, अक्सर तो अपने परिवार वाले भी नहीं

समझ पाते।

पति - पत्नी, बाप - बेटा और कभी एक दूझे के बिना सांस न लेने वाले भाई आपस में दुश्मन हो जाते हैं। ऐसा नहीं की दुनिया में विश्वास या प्यार की कमी है बल्कि एक दुसरे के लिए मर मिटने वाले भी इसी धरा पर मौजूद हैं।

बस गुजारिश इतनी है कि जब भी कोई मन मुटाव हो तो आपस में बैठकर सुलझा लेना चाहिए। अपनी गलती मानने से कोई नीचा नहीं होता और सीखने के लिए कोई उम्र छोटी या बड़ी नहीं होती।

आईये इस हसीन ज़िन्दगी को आपसी प्यार से और भी खुशगवार बना दें।



लेखक भारतीय मूल के मिनेसोटा, अमेरिका स्थित आई. टी. व्यवसायिक हैं। लेखन उनका शौक है।

ई - मेल : VishalSareen2003@gmail.com

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*Problems are meant to be solved; every solution opens doorway to new problems.
This is an endless journey to discovery of nature.*

We are, what we are, because of rigorous effort of countless persons.

—00—

*I don't think anybody anywhere can talk about the future...
without talking about education.*

Whoever controls the education of our children controls our future.

- Wilma Mankiller

—00—

*Modern cynics and skeptics... see no harm in paying those
to whom they entrust the minds of their children
a smaller wage than is paid to those to whom
they entrust the care of their plumbing.*

- John F. Kennedy

बच्चों की शिक्षा अब एक चुनौती

फणि भूषण पाण्डेय

आज के बच्चों ने शायद ही सोचा हो कि ऐसी भी कोई बीमारी होती है कि प्रत्येक अभिभावक अपने बच्चों को इस तरह घर में रखे एवं बाहर न जाने दे, जैसे कि बाहर कोई भूत बैठा हो, जो बच्चों को उठा कर ले जाएगा। ऐसा तो केवल रोते हुए शिशुओं को चुप कराने के लिए जरूर माता-पिता को कहते हुए सुना होगा कि चुप हो जा बेटा नहीं तो थैले वाला बाबा आ जायेगा, उसे पता चल जायेगा कि इनके घर में एक बच्चा है, एवं वो तुम्हें थैले में बंद करके ले जायेगा।

COVID-19 नाम की इस नई बीमारी के डर एवं संक्रामक प्रवृत्ति ने वैसे तो हर क्षेत्र में नयी चुनौती पैदा की है, लेकिन हमारे बच्चों की शिक्षा, उन्हें शिक्षा देने वाले संस्थानों एवं शिक्षकों के लिए एक तरफ विकट समस्याएं तो दूसरी तरफ शानदार मौके, दोनों ही उपलब्ध करवाए हैं। मोटे तौर पर दोनों को हम आगे के बिन्दुओं में समझ सकते हैं।

- शिक्षकों का दायित्व।
- अभिभावकों का दायित्व।
- विद्यालय एवं अभिभावकों के बीच पहले से अधिक प्रगाढ़ सम्बन्ध एवम सहयोग।
- बाल स्वास्थ्य केन्द्रित बिधियों पर ज्यादा ध्यान।
- तकनीक का बढ़ा हुआ इस्तेमाल।
- एक अलग ढांचे का विकास।
- शिक्षक प्रशिक्षण पर खर्च में कमी।

शिक्षकों का दायित्व - शिक्षक जहाँ पहले मुख्य रूप से विद्यार्थियों के लिए केवल एक विषय शिक्षक हुआ करते थे एवं कुछ शिक्षक जो विभिन्न विभागों के प्रभारी हुआ करते थे; को छोड़ दें तो अन्य सभी का ध्यान विद्यार्थियों को सम्बन्धित विषय में पारंगत करने पर होता था, अब विद्यालयों को ऐसे शिक्षकों की भूमिका में बदलाव लाना पड़ेगा, क्योंकि विद्यार्थियों के बीच दूरी बनाये रखने के लिए अब विद्यार्थियों के विद्यालय में प्रवेश से लेकर प्रस्थान तक सावधानी एक बड़ा ही महत्वपूर्ण कार्य होगा। ऐसा इसलिए कहा जा रहा है कि बच्चे आखिर बच्चे हैं चाहे-अनचाहे उनके असावधान होने एवं संक्रमित होने की सम्भावना बनी रहेगी। यद्यपि विद्यालय बच्चों की सुरक्षा हेतु भिन्न-भिन्न उपायों के साथ सामने आयेंगे चाहे इस हेतु एक कार्य दिवस में विद्यालय कम विद्यार्थियों को स्कूल बुलाएँगे। इसके लिए अल्पाविधि में जो उपाय विद्यालय अपना सकते हैं वो हो सकते हैं कि एक पाली में चलने वाले विद्यालय कम कार्यावधि की दो पालियों में बदले जाएँ या फिर विषम रोल नंबर वाले विद्यार्थी एक दिन तथा सम रोल नंबर वाले अगले दिन बुलाये जाएँ या फिर अच्छी आर्थिक पृष्ठभूमि वाले विद्यार्थी ऑनलाइन घर से एवं कम अच्छी आर्थिक स्थिति वाले ऑफलाइन अर्थात् विद्यालय आकर विद्याध्ययन करें। उक्त तरीके अपनाने पर विद्यालय अपने यहाँ कार्य कर रहे शिक्षकों की संख्या या उनके दायित्वों पर पुनः विचार करेंगे। ऐसी स्थिति में शिक्षकों की नौकरियों पर जरूर प्रतिकूल प्रभाव पड़ने की संभावना है क्योंकि अब विद्यालयों में शिक्षक कार्य के लिए अधिक कार्य बल की आवश्यकता पड़ने की संभावना है।

अभिभावकों का दायित्व - बहुत से अभिभावक जहाँ अभी तक विद्यार्थियों को विद्यालय में प्रवेश दिलाकर अपने दायित्व से मुक्त हो जाते थे एवं विद्यार्थी / बच्चों के साथ उनका वार्तालाप केवल उनकी पुस्तक, ड्रेस शुल्क आदि की पूर्ति तक सीमित रहता था; अब उन्हें बच्चों के साथ ज्यादा सक्रिय रहना पड़ेगा क्योंकि उन्हें सतत देखना पड़ेगा कि जिस

विद्यालय में उनका बच्चा प्रवेशित है, वहाँ स्वास्थ्य के प्रति लापरवाही तो नहीं हो रही! यदि विद्यालय सप्ताह में चुने हुए दिनों में ऑनलाइन कक्षाएँ करवा रहा है एवं बच्चों को घर में रहना पड़ रहा है तो इन्टरनेट एवं मोबाइल लैपटॉप के साथ उसकी गतिविधियाँ कहीं अभिभावकों के लिए कोई नयी परेशानी का सबब न बन जाय।

साथ ही मोबाइल एवं लैपटॉप के सतत प्रयोग से बच्चे के स्वास्थ्य पर प्रतिकूल प्रभाव न पड़े इसका भी उन्हें ध्यान रखना पड़ेगा। आउटडोर खेलों में प्रतिभागिता के अवसर कम होने के कारण उन अभिभावकों को जिनके घर में एकल संतान है, एक मित्र की तरह अभिभावकों को इंडोर खेलों में बच्चे के साथ सक्रिय प्रतिभागिता हेतु समय निकालना पड़ेगा चाहे वे कितना भी बड़ा दायित्व स्वयं निर्वाह क्यों न कर रहे हों।

विद्यालय एवं अभिभावकों के बीच पहले से अधिक प्रगाढ़ सम्बन्ध एवम सहयोग - अशासकीय विद्यालयों को छोड़ दें जहाँ की व्यवस्था प्रबंधन खुद के पास पर्याप्त धन-बल के साथ स्वयं सँभालते हैं, तो अन्य विद्यालयों में अच्छी व्यवस्थाएँ रहें इसके लिए अभिभावकों को अब अधिक जिम्मेदार एवं सक्रिय होना होगा एवं विद्यालयों की सहायता करनी होगी जिससे विद्यालय उनके बच्चों का बेहतर ध्यान रख सके। इसके लिए सबसे जरूरी होगा अभिभावकों एवं विद्यालयों के बीच अधिक से अधिक संपर्क का होना एवं सामंजस्य से शैक्षणिक कार्यों का संपादन होना। विद्यालयों को ये वास्तव में भूलना होगा कि विद्यालय प्रांगण में अभिभावक एक नियत तिथि जैसे कि शिक्षक-अभिभावक बैठक या अन्य किसी उत्सव के अलावा आकर कार्य में विघ्न ही पैदा करेंगे, वरन ये सोचना होगा कि अभिभावकों को लगातार, फ़ोन पर ही सही या ऑनलाइन मीटिंग से, जोड़ कर रखें; इसी में सभी का हित होगा।

बाल स्वास्थ्य केन्द्रित बिधियों पर ज्यादा ध्यान - अब तक जबकि सिद्धांत रूप में शिक्षा के तीन स्तम्भ - शिक्षक, बालक एवं शिक्षण की विषयवस्तु के अलावा चौथा स्तम्भ था शिक्षण की विधि एवं सभी मिलाकर हम ये देखते थे की अधिगम हुआ अर्थात् बच्चे ने सीखा या नहीं। किन्तु अब सभी स्तंभों में शिक्षा विधि का महत्व इसलिए बढ़ गया कि प्रत्येक विधि ऐसी हो कि SOCIAL DISTANCING का ख्याल रखा गया हो एवं विद्यार्थी के स्वास्थ्य को संक्रमण का खतरा न हो।

तकनीक का बढ़ा हुआ इस्तेमाल - यद्यपि संक्रमण के खतरे को कम करने के बाद भी हम यदि ऑनलाइन शिक्षा को बढ़ावा दे रहें हैं एवं शारीरिक-खेल-गतिविधियों जो समूह में होती है उन्हें कम कर रहें हैं तो निश्चित रूप से बाल-स्वास्थ्य के लिए विपरीत परिस्थितियाँ जरूर निर्मित कर रहें हैं। ऑनलाइन/इन्टरनेट आधारित शिक्षा की सबसे बड़ी चुनौती ये है कि किसी एक स्थान पर पूरे पाठ्यक्रम को समाहित करती सामग्री या तो निःशुल्क उपलब्ध नहीं है या फिर उपलब्ध है तो उसमें गुणवत्ता की कमी है। ऐसी स्थिति में शिक्षा नियामक संस्थाएं यदि अच्छी सामग्री एक स्थान पर उपलब्ध करा पाते हैं तो ये एक बड़ी उपलब्धि होगी। केंद्रीय माध्यमिक शिक्षा मण्डल द्वारा हाल ही शुरू किया गया 'Vidyadaan' नाम का एक पोर्टल जिसमें सभी अन्य संस्थाएं जैसे केंद्रीय विद्यालय, निजी विद्यालय एवं नवोदय विद्यालय सहयोग कर रहे हैं, इस बात की ओर इंगित भी कर रहा है जिसका सबसे बड़ा लाभ ये होगा कि वो निजी संस्थाएं जो ऑनलाइन शिक्षा को व्यवसाय बना कर सामान्य जन के लिए अच्छी शिक्षा को दूधर बना रही हैं उन्हें कड़ी प्रतियोगिता मिलेगी

एवं अन्य निजी संस्थानों के आगे आने के बाद गुणवत्तापूर्ण ऑनलाइन शिक्षा सस्ती होगी।

एक अलग ढाँचे का विकास – सभी शिक्षण संस्थानों को अब अपने विद्यालयीन ढाँचे एवं अपनी तैयारियों को नयी परिस्थिति के अनुसार चाक-चौबंद करना होगा। कक्षा में बच्चों की संख्या पर अनचाहे ही सही लेकिन लगाम लगानी होगी अन्यथा तो शिक्षा के सुधार की तमाम कमेटियों के सुझावों के बाबजूद भिन्न-भिन्न तरीके अपनाकर अधिक से अधिक विद्यार्थियों के प्रवेश की कोशिश में संस्थान लगे रहते थे। दिल्ली एवं कोटा जैसे स्थानों के कोचिंग संस्थानों की तो बात ही छोड़ दीजिये, वहाँ की कक्षाओं का आकार तो 250 विद्यार्थियों वाला होता था।

शिक्षक प्रशिक्षण पर खर्च – शासकीय विद्यालयों के प्रशिक्षण में जहाँ अब तक सरकार को एक अच्छी धन राशि खर्च करनी पड़ती थी जिसमें

प्रशिक्षणार्थी एक स्थान पर एकत्र होकर प्रशिक्षण प्राप्त करें; परन्तु अब समय आ गया है कि प्रशिक्षण अल्पावधि के Online प्रशिक्षणों में परिवर्तित हो जायेंगे जिसके लिए प्रत्येक विद्यालय में ढाँचागत विकास एवं उसके मरोम्मत पर जोर देना होगा। ढाँचे का विकसित होना लम्बी अवधि में विद्यालयों के लिए निश्चित रूप से लाभ की स्थिति होगी क्योंकि एक तो शिक्षकों की यात्रा में जो समय लगता था वो अब विद्यालय एवं विद्यार्थियों के लिए लगेगा एवं धन राशि भी बचेगी जिससे सरकार विद्यालयों के लिए अधिक राशि उपलब्ध करा सकेगी।

कुल मिलाकर ये कहना होगा कि जब तक COVID-19 की वैक्सीन नहीं बन जाती व सुगमता से उपलब्ध नहीं हो जाती, राह बड़ी चुनौतीपूर्ण है।



लेखक M.Sc. (Physics), एवं मध्यप्रदेश के मूल निवासी हैं, वे केंद्रीय विद्यालय, दिनजन, डिब्रूगढ़ असम में 2017 से प्राचार्य हैं, वे 2002 से केंद्रीय विद्यालय में स्नातकोत्तर शिक्षक के रूप में सेवाएँ प्रदान कर रहे हैं. उन्होंने अपनी शाला में इस सत्र के आरम्भ से ही नियमित ऑनलाइन शिक्षा चालू करायी. शिक्षा के उत्तरोत्तर विकास एवं विद्यार्थियों का चहुँमुखी उत्थान उनकी विशेष रूचि है.

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EVOLUTION OF IOMS

- Philosophy of IOMS had its inception in Sarthak Prayash an NGO, in May'2012 in Chalk-N-Talk Mode with stray students.
- Its manifestation in the form of e-Bulletin started in 2016, on 2nd October with its First Issue **Subodh पत्रिका**
- In May' 2017 the initiative was upgraded to IOMS, in its primitive form, with the efforts of its Shri Shailendra Parolkar
- This initiative was reorganized as Gyan Vigyan Sarita in 2017 with its e-Bulletin in the name of **Gyan Vigyan Sarita – शिक्षा**
- With this e-Bulletin as Fourth Annual issue, we are stepping in Fifth year of broadening communication to invoke participation of those who can make a difference, for the larger good.
 - Presently it is a satisfactory working model on 'Minimum Need' basis.
- Currently about 75 students in Two rural schools, one is RKM High School in A.P. and other is Army Public School, Dinjan, Assam, are being ng mentored. At Dinjan it is our first step to mentor children of our brave soldiers securing our frontiers
 - We continue to look forward.....

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BENEFITS OF LOCKDOWN

Namita Nath

Corona virus has become a global epidemic. It had originated from China and has spread to at least 170 countries resulting in complete lockdown in some of the countries, which in turn has resulted in economies crumbling down, stock markets crashing, increasing anxiety among employees as the factories and workplaces are closed; they are scared to lose their jobs, increase in domestic violence etc., and above all, no identifiable cure to the disease have been invented so far. WHO named coronavirus as CoVid-19 on 11th Feb 2020 and declared it as pandemic.

Being very contagious, the only way which could save the people from infection is the lockdown. Lockdowns around the world to slow the spread of corona virus have unintentionally reduced pollution level in the atmosphere. From New Delhi to Milan, the air has become cleaner, in many of the world's most polluted areas as people now stay at home, the industries are closed, means of transportation have reduced and so is the exhaust from these sectors. There has been considerable decrease in the level of PM_{2.5}, NO₂ etc. According to the air quality report 2019, 21 out of the 30 most polluted cities in the world are in India, and India is the 5th most polluted countries of the world, Bangladesh being at the top. NO₂ is an air pollutant whose sources are mainly fuel combustion, exhaust of vehicles and industries. NO₂ is responsible for causing Asthma in children. In India, about 16,000 premature deaths occur every year due to NO₂.

There has also been considerable improvement in the Air Quality Index. According to a study made by IIT Delhi, in Delhi, for the first time there has been 43% drop in the level of PM-2.5, 31% drop in the PM-10, 10 % drop in CO level and about 18% drop in the NO₂ level. For the first time in many years clean water could be seen in Yamuna River and also Delhi people could see the blue sky. The Ozone layer which was getting depleted due to pollution and use of CFCs has healed by 10% compared to the last three years. The nature is healing and it has been possible due to non interference of human activities in the cycle of the nature.

Since, the pollution level in the environment has reduced there has been considerable decrease in the air borne diseases. The fishes and other aquatic animals are enjoying

a peaceful life. Many aquatic animals are crowding the beaches. People are learning to live with the minimum resources available to them. They are learning to make the optimum use of resources available to them.

There are two sides to every coin, though the lockdown has confined our lives within the four walls, has affected the economy, education sector etc. but if we see at its positive side, it has helped us to save our self not only from covid-19 but it has also helped in healing the atmosphere, which is the need of the hour.

Compulsion of social distancing have imposed necessity of maintaining continuity of education. Advent of technology has created new opportunities, challenges, necessities and possibilities in education. Growing communication is progressively increasing access to education of deprived students, while reducing costs in increasing penetration and feasibility of connectivity to teachers, irrespective of geographical boundaries.

There is no substitute to Chalk-n-Talk mode of education possible at school. It offers an opportunity of socialization and an invaluable teacher-taught bondage necessary for overall growth of the personality of children. This environment of online education may help in maintaining continuity of learning but deprive children to enjoy thrill of adventure, an essential part of learning and growing

But, all this is true when we continue to exists as a society. Keeping this into consideration, we as a global community finding endangered of existence, social thinkers, reformers, technologists, teachers and last-but-not the least parents are proactively coming forward to collectively complement each other in maintaining learning an interactive pursuit. Efforts are being made to transfer knowledge not as one-way traffic, but bilaterally interactive.

Human race has illustrious history of successfully emerging from point of extinction caused by multiple disasters and calamities. It has been successful in innovating newer option to survive and grow. It adds to our optimism in this Corona pandemic. Let us start on toes without waiting for others to follow....



Author is M.Sc.(Physics) and a Post Graduate Teacher at Army Public School, Dinjan, Dibrugarh, Assam. She is passionate about teaching and grooming students to think about science not as a subject to learn, but experience in their surrounding.

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कोरोना महामारी : चुनौतियों को अवसरों में बदलें

मूलचंद महला

पूरे विश्व को अपनी चपेट में ले चुके कोरोना के दीर्घकालिक प्रभाव को देखते हुए विद्यालयों, महाविद्यालयों एवं विश्वविद्यालयों को ऑनलाइन शिक्षा की दिशा में कदम बढ़ाना होगा। ऑनलाइन शिक्षा की शुरुआत अनेकों वर्ष पहले उच्च शिक्षा के क्षेत्र में हुई थी। प्रारंभ में कम गुणवत्ता वाले पाठ्यक्रम डिजाइन, विद्यार्थियों एवं शोधकर्ताओं के साथ धोखाधड़ी और शिक्षण संस्थानों के वातावरण की कमी के लिए इसकी काफी आलोचना हुई थी। सौभाग्य से, जैसे-जैसे प्रौद्योगिकी में सुधार हुआ और प्रतिस्पर्धा बढ़ी, वैसे-वैसे गैर-लाभकारी प्रतिभागियों ने ऑनलाइन शिक्षा को एक विशिष्ट स्थान दिलाया है।

अभिभावकों की जिम्मेदारी: लॉक डाउन के चलते बच्चे एवं विद्यार्थियों को बाहर घूमने, शिक्षण संस्थानों में अपने दोस्तों के साथ बातें करने, नए-नए दोस्त बनाने, साथ बैठकर खाना खाने, खेलने-कूदने, जन्मदिन मनाने, अन्य शारीरिक एवं मानसिक गतिविधियों में भाग लेने का अवसर नहीं मिल पा रहा है। इस कारण अभिभावकों की जिम्मेदारी भी काफी बढ़ जाती है। अभिभावकों द्वारा इस बात का ध्यान रखा जाए कि बच्चे नियमित रूप से प्रातःकाल में उठें, निरन्तर योग एवं सामान्य व्यायाम करें जिससे वे शारीरिक सक्रिय एवं मानसिक रूप से स्वस्थ रह सकें। विद्यालय की अवधि के दौरान ऑनलाइन कक्षाओं में उपस्थित होने के लिए प्रेरित करें। इसके बाद वह दिन भर मोबाइल के साथ व्यस्त न रहे अन्यथा वह इसका आदतन भी बन सकता है। समय-समय पर काउंसलिंग करवाई जाए। सायंकाल में घरेलू एवं पारम्परिक खेल खेलने दिया जाए। हमेशा बच्चों के साथ समय निकालकर संवाद स्थापित किया जाय।

शिक्षकों की भूमिका: हालांकि, अचानक से लॉक डाउन होने की वजह से अनेकों शिक्षक ऑनलाइन शिक्षा के लिए आवश्यक सामग्रियों

जैसे लैपटॉप, व्हाइट बोर्ड, e-नोट्स आदि को प्राप्त नहीं कर पाए फिर भी शिक्षकों ने बेहतर तरिके से बच्चों को ऑनलाइन शिक्षा प्रदान करना शुरू किया है। इसकी गुणवत्ता को और बढ़ाया जाना चाहिये। समय-समय पर विद्यार्थियों की काउंसलिंग की जाए। बच्चों के अभिभावकों से संवाद किया जाए और विद्यार्थियों की समस्याओं को पहचाने तथा उनको दूर किया जाए। यह सर्वविदित है कि विद्यालय छात्रों के लिए ऑनलाइन शिक्षा कभी भी ऑफलाइन शिक्षा का स्थान नहीं ले सकती है। क्योंकि विद्यालय में विद्यार्थियों का मानसिक, शारीरिक एवं चहुमुखी विकास होता है। लेकिन वर्तमान परिस्थितियों में इस चुनौती को एक अवसर के तौर पर लिया जाए ताकि बच्चों का कीमती समय व्यर्थ न जाये और सभी छात्र अपनी पढ़ाई में नियमितता बनाये रख सकें।

विद्यार्थियों का कर्तव्य: विद्यार्थी नियमित रूप से योग करें। विद्यालय समयावधि के दौरान ऑनलाइन कक्षाओं में उपस्थित रहें। विद्यालय समयावधि के बाद बहुत ज्यादा मोबाइल साथ के व्यस्त न रहे क्योंकि इससे विभिन्न प्रकार की मानसिक बीमारियां हो जाती है। डिजिटल गेम जैसे पब्जी तथा सोशल मीडिया जैसे टिक-टॉक से दूरी बनाए रखें। इसका आदतन होना विभिन्न प्रकार की मानसिक बीमारियों को जन्म देता है। किसी भी प्रकार की समस्या होने पर शिक्षकों से संवाद करें एवं काउंसलिंग लें।

करो योग, रहो निरोग।

घर पर रहें, सुरक्षित रहें।

घर का खाना खाएं, स्वस्थ रहें।

स्वदेशी अपनाये, देश को मजबूत बनाये।



लेखक. M.Sc. एवं NET हैं। वर्तमान में रसायन विज्ञान विषय के स्नातकोत्तर शिक्षक, केंद्रीय विद्यालय दिनजान, डिब्रूगढ़, असम में कार्यरत हैं।

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Roots of education are bitter, but the fruit is sweet.

- Aristotle

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Strength and sense of judgement comes from wisdom and not mere knowledge.

—00—

Change in Paradigm; All Thanks to CORONA

Mrs. Simran Singh

चढ़दे सूरज ढलदे देखे, बुझदे दीवे बलदे देखे ।
 हीरे दा कोई मुल ना जाणे, खोटे सिक्के चलदे देखे ।
 जिना दा न जग ते कोई, ओ वी पुत्तर पलदे देखे ।
 उसदी रहमत दे नाल बंदे, पाणी उते चलदे देखे ।
 लोकी कैदे दाल नइ गलदी, मैं ते पत्थर गलदे देखे ।
 जिन्हा ने कदर ना कीती रब दी, हथ खाली ओ मलदे देखे ।
 कई पैरां तो नंगे फिरदे, सिर ते लभदे छावा...
 मैनु दाता सब कुछ दित्ता, क्यों ना शुकुर मनाव...

This quote by Bulleh Shah actually reminds me of how thankful I should be, count my blessings, for all the have instead of the have nots. Its human tendency to keep racing from one achievement to another and why not, only when you aim for the 9th cloud you will reach the 7th. But, this lockdown has been a reality check. In all aspects of life, it has brought the much needed PAUSE. The pace of life as a mother, a teacher and an army wife was like sand slipping through my fingers.

Life which seemed in the 5th gear, now was a sand still. No more alarms, no more rash driving, no more deadlines, no more to do lists. Just breathe and take a break.

This Corona.....

Corona made me wonder,
 How come I have so much time to ponder.
 There were times when I felt 24 hours were less,
 So much to do so much of stress.

COVID-19, the invisible foe, put a break,
 Initially I wasn't sure if its real or fake.
 Suddenly I have so much time on my hands,
 I have all the time for all my plans.

At first, I rested and enjoyed to my heart's content,
 What a life! That's how it's meant.
 Slowly it dawned upon me,
 All my responsibilities as the 'Queen bee'.

As the clock ticked away, the gravity of the situation made me realise that this isn't a child's play. This virus is going to change our lives in many ways and we need a completely different outlook towards it. Thinking was in full sprint, how to teach the students, how to manage things at home, how to ensure safety, how to stay in doors for longer than my mind could comprehend.

As the worldly bonds seem to fade away the family bonds were growing at a stupendous scale. How lovely it was to be with my loved ones in such testing times. This blessing in disguise, being denied to a few. So it's now time to enjoy the GIFT of the PRESENT.

This moment brought about the realisation that being happy is not having a sky without a storm, a road without ups and downs or work without fatigue. It's time to dwell upon, happiness being in doors, thank God for the miracle of life, love unconditionally and just be there with each other gratefully. Take time to enjoy the smile but reflect on the sadness faced by our brethren.

These moments may churn a NEW me, I must use tears to irrigate tolerance, use mistakes to sculpt serenity, use obstacles to open new windows. Time calls for a change. Change! lest you perish.

The tempo of the everyday routine would take many relationships for granted. The deficit of a purposeful smile, a warm hug, a loving kiss or just running fingers in the hair of my children needed to be more adequately fulfilled. Not that it had diminished in the chores, but had been done with haste, at times. Now was the time to make all this more **DELIBERATE**. Now is the time to cherish the phase of my child's life instead of watching them grow with an unthinkable momentum and then wonder where the time just flew away.

It's time to celebrate and propagate other talent that's beyond the measures of numbers, beyond the periphery of report cards, beyond the shackles of time. Now we again find 24 hours less. Less to bond, to be merry, to enjoy each other's company. **WHAT A SHIFT IN PARADIGM!** There is undoubtedly a lot of damage done by Corona but there's a lot that it mends as well. All you need is eyes to see, provided they are the eyes of your heart. Just as the environment is breathing all over again with novelty, I could discover new ME, new OUR time and a new throttle to life's most precious and treasured relationships.

Though I did play my role as a teacher contributing to education with my self-made videos, it was just like a drop in the mighty ocean. But, I did and that made me feel like I could touch the future by planting seeds of a good education in minds of our future citizens.

Still all thanks to the lockdown..... The mother in me The homemaker in me Overwhelmed all the realms of my life. What a bliss!



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Phenomenon of Critical Thinking, Curiosity and Creativity in the Life of Students

Abhineshwar Kanaujia

As I am observing from past few years, I have been talking and doing a lot with regards to turning all my thoughts and ideas on creativity into chunks that can be conveyed, e.g. through developing teaching ideas in school courses on the topics in physics. This results in conversations with students and their parents having varied background i.e. economically weak background like tea garden labour, most of parents doing labour work with their children. It is not easy for them to survive, pursuing their education, with discharge of their daily activities. But doing so is obviously is a breeding ground for further evolution in my thinking as brought out below.

The 3C introduction in life of students.

One of the interesting discussions that came up was the extent to which something like “Critical thinking” is the same, similar or totally different from “Creativity”. Just to make it all a little more complex, the concept of “Curiosity” can also be drawn into this discussion. *Is curiosity more, like I imagine, the driver of the other two, or does it belong to one of them?* I will get back to that.

Now a days a new concept is also introduced by Kendriya Vidyalaya Sangathan, C.C.T. : Creative and Critical Thinking to evolve the solution in daily life problems.

But, in my opinion it could be said that asking questions is by definition part of the Critical thinking-corner, while I really see it as part of being Curious, and to an extent also Creative. For me, if I would have to give some form of concise definitions, these would be:

Curiosity = wondering about alternatives, known and unknown

Critical thinking = assessing/ judging what we know

Creativity = actually coming up with these alternatives, beyond obvious known ones

But, if you look for example at the many different definitions of even, say, Critical thinking, let alone Creativity, and the more you actually discuss this stuff, the more the thought creeps in, do these distinctions really matter? Perhaps not. But if you are increasingly engaged in conversations where you are asked to explain the exact difference, there is an incentive to at least give it some thought. Case in point: a few months ago a student stated to me *“Why should I care about Curiosity? we already are trained in Critical Thinking”*.

My opinion and my take:

After many of these discussions, dialogue, own reflection, and playing with the ingredients, I see the 3 C's as somewhat distinguishable ingredients, more on an intuitive

plane rather than at the level of absolute definition. Much more importantly, I think that in the vast majority of cases, they feed into each other, strengthen each other. Consider it to be not even and it's not a static relationship, or even equilibrium, it's a continuing and evolutionary process. In fact, one good visual representation is nature. If we watch nature minutely and silently will get most of answer of questions that raised in our mind. Most of scientist were curious to know about *How and Why* ??? And then used their power of brain given by God, equally to everyone i.e. critical thinking and using this they created solutions and answers to release their discomfort. This is the proper consequence which improves scientific skill.

I have observed that when a new kid is born, since beginning, the babies watch, observe, and try to do by itself whatever that baby watched. It means that every human being is born with 3C's as gift of the God. Many examples are there in Indian history too, viz Abhimanyu in Mahabharata, that substantiate this observation.

How is one without the other in our life?

All three Cs might have some value, if considered separately. But that value would be very limited, in the context of creating change, doing things differently, progress in other words.

Consider this, and please feel the points being made, don't micro-drill them:

Critical Thinking without Curiosity = just being negative. It's easy, not to say lazy to just say “No, I don't believe that”, or “I don't support your reasoning”. And then stop thinking.

Curiosity without Creativity = daydreaming without stopping. *Do we do need an extent of daydreaming (e.g. read Wired to Create), but without end ...?*

Creativity without Critical thinking = mindless generation of ideas (solutions) without a context (problem). This is what some claim Art is, but *aren't artists also supposed to be the critics of society?* And, seen creatively ... *is it not one of the drivers of an artist to create something the observation that apparently something is missing?*

Curiosity without Critical thinking = never reject any idea; it should be allowed to grow to its potential without any prejudice. The golden rule of many creativity-tools. Or, alternatively, just being nosy, in a bad way.

Creativity without Curiosity = generating obvious ideas. Ideas can be ‘novel’ but still obvious and in lie with

prevalent practices. This is the reason that Patent-Law includes the criterion of non-obviousness.

Critical thinking without Creativity = cynical, closed-minded, similar to omitting the curiosity. It's just about not allowing other people's ideas to be embraced, destruction without creation.

As you can see, if unchecked almost all of these initially wonderful concepts can go out of control, move to an extreme. And they will. In real life this, mostly, does not happen, exactly because the other two are there to make sure of that.

If you would plough through the dozens, perhaps hundreds of definitions and perceptions that float around, the general pattern seems to be that Creativity is fueled by rejecting popular conventional ideas (= critical thinking) and support

new (= curious) fresh ideas (= generative). For me it would be basically impossible to see how someone can be creative without being at all curious, even more so than vice-versa. It does not seem to be possible, to be curious (= wonder) without being creative (= wander with aim). Again, that's more an intuitive stance, but for me reason to choose Curiosity as starting point for creativity instead of the other way around.

So, what is the conclusion? Is it needed? Just like for me the picture that I paint above makes sense, for you, and yet others, it may not. This is how I can work with these concepts in a productive way, without endlessly having to discuss what the differences are exactly. The clue is to embrace their complexity; they exist, work and belong together. The real ***magic lies in their interdependencies, not their isolated perfection.***



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It has been observed that normally a person responds to a problem or a situation either extempore or thoughtfully. Extempore response is intuitive and instant, while thoughtful response is delayed. This delay depends upon one's ability, patience to analyze the situation and the time available to respond. Accuracy of instant response is regulated by intuitive skills of the person. Growth of this intuition in turn is regulated by expertise attained by a person to analyze and act upon a situation. Multidimensionality in versatility, depth and spread of the intuition leads to wisdom.

This expertise or wisdom cannot be achieved in one leap. It is a result of perseverance in the pursuit of striving against cyclic failure-success and grows like a spiral.

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Education is not filling of a pail, but lighting of a fire.

- William Butler Yates

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If you can find a path with no obstacles, it probably doesn't lead anywhere

- Frank A. Clark

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दिल तो बच्चा है

अर्चना पांडेय 'अर्चि'

राधा देवी की ज़िंदगी बहुत ही खुशहाल थी। उनकी पसंद की लगभग प्रत्येक वस्तु उनके पास विराजमान थी। यूँ तो उनकी शादी आठ

वर्ष की उम्र में हुई थी क्योंकि उनकी बड़ी बहन की शादी हो रही थी तो साथ में उनकी भी कर दी गई। लेकिन राधा देवी के जीवन में कभी कोई चीज की कमी नहीं हुई। छोटी उम्र में शादी होने की वजह से ससुराल में बहुत सारा प्यार मिला। उनकी बड़ी दीदी वसुंधरा देवी भी अपनी छोटी बहन का खास ख्याल रखती थी। वसुंधरा देवी के पति नाते में राधा देवी के जीजा जी होते थे लेकिन भसुर वाला रिश्ता ही हमेशा कायम रहा। कभी कभार हँसी मजाक हो जाया करती थी वो अलग बात थी।

साठ की उम्र बीत जाने के बाद भी राधा देवी के जीवन में खुशियाँ ही खुशियाँ थी। उनके सारे बच्चे सेटल हो चुके थे। उनकी छोटी बहू विभा उनकी खुशियों की श्रोत थी। राधा देवी ने हमेशा विभा को अपनी बेटी से बढ़कर माना तथा विभा ने भी उनका मान रखा वो भी अच्छे खानदान से थी और राधा देवी को अपनी माँ से बढ़कर मानती थी। एक रात की बात है तकरीबन 2 बजे रात को राधा देवी के पति वासुदेव जी जोर जोर से आवाज लगाने लगे

अरे वो चिट्ठू की मइया, सुनती हो,

हमार छाती में बहते दर्द है,

हम से बर्दाश्त नहीं होत है, चिट्ठू को बुलाओ,

डॉक्टर साहब के पास अबही ले चलो

अइसन लगता है कि जान निकल जाई

चिट्ठू का हुआ बाबू जी

बाबूजी तब तक बेहोश हो गए

विभा पानी गर्म कर के लाई, बाबूजी गर्म पानी पी लीजिए आराम हो जाएगा।

बाहर में अंधी तूफान जोर पर था ऊपर से रात के 2 बज रहे थे।

चिट्ठू फोन उठाकर डॉक्टर को फोन लगता है

डॉक्टर अंसारी, आवाज आता है जिस नम्बर को आप फोन लगा रहे है वो पहुँच के बाहर है।

राधा देवी पैर में जोर जोर से तेल मालिस करने लगी

घर में अफरा तफरी मच गया। जब तक डॉक्टर पहुँचा, सुबह हो गई।

घर में आस पास के लोग जमा हो गए।

वासुदेव बाबू स्वर्ण सिंघार चुके थे। घर में मातम का माहौल छा गया। जितनी मुँह उतनी बातें

कई लोग कहते अगर समय पर डॉक्टर बाबू आ जाते तो वासुदेव भैया

अवश्य बच जाते। पैसठ वर्ष के ही तो थे, ये भी कोई उम्र है जाने की।

वासुदेव जी बड़े खुशमिजाज किस्म के थे आस पास के गांव के लोग से उनकी खूब बनती थी। सभी लोग उनकी मौत से दुःखी थे।

राधा देवी शौकीन मिजाज की थी। लाल रंग से उनको बहुत प्यार था। पति के मौत के बाद किसी को हिम्मत नहीं हो रही थी कोई उनके पास सफेद साड़ी लेकर जाए। यह काम उनकी छोटी ननद शोभा को दिया गया, जिसको राधा अपनी बेटी जैसा प्यार करती थी।

शोभा डरते डरते गई सफेद कपड़े लेकर

भौजी ई ल

आज से ई हे

राधा का.....

ई सफेद साड़ी हमरा के

ना हमारा से ना होई

सफेद साड़ी राधा उठा कर फेंक देती है।

किसी की हिम्मत नहीं होती कि उनको जा कर बोले कि सफेद साड़ी पहने।

राधा चिल्ला- चिल्ला कर कह रही थी -

हमार पति के मौत हुई है,

हमार मन के ना हम विधवा हुए है,

हमार मन आज भी सुंदर चीज को पसंद करत है।

हम से सफेद कपड़ा धारण ना होई।

ई समाज आपन रस्म हमारा पर मत थोपो, हम विधवा भइनी, हमार मन ना।

ये सब सुनकर सभी की छाती फट जाती हाय रे समाज, हाय रे रीति रिवाज।

सभी की आंखें छलक जाती। खुले दिल वाली राधा आगे कहती -

जब दो लोग एक साथ जन्म नहीं लेते,

तो एक साथ मरेंगे कैसे?

राधा के जहन में तमाम सवाल थे जो समाज के मुँह पर चाटा थे। जिनका उत्तर किसी के पास नहीं था।

बाद में पुरोहित जी के बहुत मनाने पर वह सफेद कपड़े पहनी लेकिन संतुष्ट नहीं थी।

समय का काम है चलते जाना कभी रुकता नहीं है। पांच वर्ष के बाद राधा देवी की पोती मुस्कान की शादी ठीक हुई जो पेशे से इंजीनियर थी और उसका होने वाला पति भी इंजीनियर था। घर में खूब शॉपिंग हो रही थी। किसी दिन गहने की तो किसी दिन कपड़े की। सभी के लिए कपड़े खरीदें

गए। राधा देवी के लिए भी सूती की हल्के रंग की साड़ी जो उनको बिल्कुल न भाई। लेकिन उतने सारे लोगों में कुछ कह न पाई।

चपल जो उनके लिए खरीदें गए थे वो फूटे आंख न सुहाए। बेचारी मन को कितना संभाले बाकी लोगों के रंग विरंगे कपड़े गहने देखकर राधा का मन विचलित हो रहा था।

शादी के दिन तो गजब हो गया। सभी के लाल पीले चमकीले लिबास में देखकर राधा ने भी अपनी एक पहले वाली लाल साड़ी पहन ली लेकिन वह साड़ी बहुत पुरानी होने की वजह से राधा के मन को कुछ भी अच्छा नहीं लग रहा था। शाम हो होने लगी देखते ही देखते सारे हित रिश्तेदार पहुंच गए। राधा के भाई और भतीजे तथा साथ में भाभी भी आई।



लेखिका, उदलगुरी चाय बागान, डिब्रूगढ़ असम M. A, B.Ed., P.hd हैं। इनका व्यवसाय शिक्षण/संपादक/अध्यक्ष हिंददेश है। इन्हें साहित्य ज्योति, सहित्य सरोवर, हिंददेश, कुंज प्रसून श्रेष्ठ रचनाकार इत्यादि सम्मान प्राप्त हैं। वे उदलगुरी चाय बागान, डिब्रूगढ़ असम निवासी हैं।

ई. मेल. archanakumari.tsk@gmail.com

(यह कहानी दैनिक पूर्वोदय में पूर्व-प्रकाशित है)

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Women and Society

Neelma Kapoor

I feel if I venture to discuss this topic to my fellow citizens, each of them will nullify this issue by saying casually that much has been done in this field and see what posts in all spheres they have reached. Sometimes I also feel proud to see all this- women as scientists, ministers, IAS - IPS officers, military army, navy BSF, pilots and what not!

Still some corner of the heart says, 'No, there is something wrong somewhere'. Whenever we celebrate Mother's Day or Woman's Day, it always leaves me with one big question mark regarding the strength and dignity of women; are we genuinely allotting it to them all?. It's mother who brings us on this earth bearing all discomfort of pregnancy and pain of delivery but probably she herself as a mother and school society all forget to teach the coming generation to regard her.

Intermittently, news keep pouring in that very casually women are being pulled to a public platform, hurt, insulted and humiliated. **Who has given men this right? Why can't they allot due honour to women?** Women is quite openly and silently abused, accused, dishonoured and made victim of domestic violence and estrangement! Still, see the courage of women; despite facing all this and many times challenging it, they are suddenly rising and competing with men. A few egoistic males never agree to allow women on

the same pedestal. And then politics start! What a false egotism!

Equal responsibility bearer, hard worker better and more systematic manager- women are not regarded their due place in families at micro level and society at macro level. Though it is only in some parts and some homes but, my question is- **why is it there?**

Though education is striving it's best to uplift women even in remote and hidden corners still age long mentality is leaving its foothold very slowly. In many families and organizations women are not accepted as partners. Now it's the high time to realize the importance of women and honour them for being 'them' only. I sincerely hope that even in hidden corners of society this discrimination is uprooted and due place is awarded to our women. This practice will be strong only with family education. So my request to parents is not to your miss to sow this seed in their children. Real education starts at home. Discrimination between Male and female children must be stopped earliest possible. On paper woman is equal but in reality it is still a myth which is still waiting the absolute transformation



Author is post graduate in English and Education. She has been a senior teacher for three decades at Vivekananda School, Delhi. Post retirement she carries strong passion and wish to translate her experience for the larger good in the form of social service, she is fond of writing articles and poems in English and Hindi. She continues with her efforts to learn new things in school of life.

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संस्मरण

अधि. ज्योति रानी

बड़ी-बड़ी आँखें, गोरा रंग ... घने लम्बे बाल .. अरे बस देखती ही रहोगी की प्रणाम भी करोगी मुझे ? हड़बड़ाते हुए मैंने झुक के छोटी मम्मी के पैर छुए ..

छोटी चाची मत कहो मुझे , छोटी मम्मी ही ठीक है , अच्छा लगता है .. पहली बार जब मिली थी तभी उन्होंने मुझसे कहा था . मेरी अपनी सासु माँ नहीं थी पर छोटी मम्मी के स्नेह के कारण कभी कभी महसूस नहीं हुई !

छोटे चाचाजी ने अपनी पसंद से शादी की थी , परंपरावादी रूढ़िवादी परिवार में छोटे चाचा जी पहले व्यक्ति थे जिन्होंने ऐसी हिम्मत की थी !

पहली बार जब छोटे चाचा जी उस रात छोटी मम्मी को लेकर गाँव आए थे तो मेरे दादा ससुर जी गुस्से से तमतमाते हुए दो-टूक कह दिया था की अब इस घर में उन लोगों के लिए कोई जगह नहीं , रात को अब छोटी मम्मी को कहाँ ले जाएँ , सोच में पड़ गए थे चाचा जी ! फिर उनके बचपन के दोस्त ने रात भर अपने घर में जगह दी थी , सुबह चार बजे ही उठकर दोनों ने पटना के लिए बस पकड़ ली थी , चाचा जी वन विभाग में नौकरी करते थे , पटना में जब पढ़ते थे तभी कॉलेज में छोटी मम्मी से मुलाकात हुई थी .. उनकी सादगी और स्वभाव ने काफ़ी आकर्षित किया था और उन्होंने शादी करने का फ़ैसला ले लिया था !

बीच वाले चाचा जी की शादी में खूब दान दहेज मिला था , दादा ससुर और दादी जी खूब प्रसन्न रहते बीच वाली चाची जी से , वो भी खूब ठसक में रहती थी ! उनको अपने द्वारा लाए गए दान दहेज का बहुत गुमान था , बराबर मायका ही रहतीं , चार भाइयों में अकेली बहन थी .. मायका में बहुत मान था उनका .. छोटे चाचा जी की शादी के दो साल बाद दादी सास की तबियत काफ़ी ख़राब हो गयी .. डॉक्टर ने दादा ससुर को बताया की माँ जी को जाँच में टी बी आया है और इनको दवाई के साथ साथ देखभाल की भी बहुत ज़रूरत होगी ! दादा ससुर सुन्न पड़ गए , वो विचलित हो गए की अब कौन सेवा करेगा क्योंकि बीच वाली चाची अपने

भाई की शादी में जो मायके गयी थी वो आने का नाम नहीं ले रही थी अब तो और नहीं आती .. सेवा जो करनी पड़ती ! इसी बीच छोटे चाचा के गाँव वाले दोस्त ने उनको खबर कर दी थी कि माँ जी की तबियत ठीक नहीं भाभी को लेकर आ जाओ !

चाचा जी दूसरे ही दिन छोटी मम्मी को लेकर गाँव आ गए थे , उनको देखते ही दादा ससुर जार जार रोने लगे .. चाचाजी ने कहा बाबूजी आप चिंता ना करें माँ जल्दी स्वस्थ हो जाएंगी !

छोटी मम्मी ने सेवा में दिन रात एक कर दिया .. दवाई से लेकर खान-पान सबका ध्यान रखती थी ..

तीन महीने में तबियत काफ़ी अच्छी हो चली थी दादीजी की ! एक दिन दादा ससुर हाथ जोड़कर छोटी मम्मी के सामने खड़े हो गए , उनकी आँखों से अश्रु की अविरल धारा बह रही थी .. छोटी मम्मी उनके पैरों में गिरकर बोली.. बाबूजी ऐसा ना कहें .. मैं सेवा करके धन्य हो गयी , ऐसे ही अपना आशीर्वाद हमेशा बनाएँ रखिएगा .. ये बोलते -बोलते वो जार जार रोने लगी .. मैंने जब हाथों से आँसू पोछने की कोशिश की तब उनकी तंद्रा टूटी ..

अरे मैं भी क्या बात लेकर बैठ गयी .. चल मैं तेरे खाने के लिए कुछ लेकर आती हूँ .. मैं एकटक कमरे से बाहर जाते देख रही थी ..

आज उनकी दूसरी पुण्यतिथि के दिन बहुत याद आ रही उनकी .. आँसू रुक ही नहीं रहे .. कुछ नहीं हुआ था उनको अचानक हमें पता चला था की रात जो सोयीं तो सुबह फिर नहीं उठी .. अंतिम दर्शन तक से वंचित रह गयी मैं ..

क्या भगवान के पास में अच्छे लोगों की कमी रहती है ? रहने ही नहीं देते उन्हें यहाँ .. इस दुःख भरे संसार में ..



लेखिका सर्टिफ़ायड न्यूरो लिंग्विस्टिक प्रैक्टीशनर है . तनाव-प्रबंधन पर उन्होंने बहुत सारी ट्रेनिंग दी हैं .. उनका तरीका बहुत ही सरल और व्यावहारिक होता है ! वह क़ानून में स्नातक हैं .. और फ़्रीलैन्सर मानवाधिकार कार्यकर्ता ! उनके योगदान के लिए दो बार उन्हें सम्मानित भी किया जा चुका है .. वो बिहार के सुदूर देहात में लोगों के सेवा कर रही हैं .. वहाँ से ज़िला पार्षद रह चुकी हैं (2011-2016) .. ग्रामीण इलाकों की महिलाओं को साफ़-सफ़ाई और “हम दो हमारे दो” के लिए प्रेरित करती है .. मानवाधिकार और स्वच्छता के विशेष अध्ययन के लिए सिंगापुर और दुबई भी जा चुकी हैं .. ज़रूरतमंद बच्चों को संगीत की फ़्री क्लैसेज़ भी देती हैं ..

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I have been impressed with the urgency of doing.

Knowing is not enough; we must apply.

Being willing is not enough; we must do."

- Leonardo da Vinci

Multiplication Table up to 99 in Your Hands

(A simple technique)

H.D. Motiramani

In all the competitive exams importance of verbal calculation is immense. A small interesting technique is presented here to enable us to multiply two digit numbers with a single digit number mentally. Of course, it is presumed that we know the multiplication from 2 to 9. With these few words of introduction, multiplication table up to 99 is now in your hands.

Method is pretty very simple. Consider each of the two digits needing multiplication separated from each other. Let the left digit or the one that comes first from left be visualized to be there in your left hand. Similarly, the second digit on right, that is the one at unit place, be visualized to be there in your right hand. For example, if we want the multiplication of 78, Let 7 be considered to be there in left hand and 8 in right hand. We have also to remember that left hand is having 7 and right hand is having 8. So one can in his mind repeat 7, 8 twice or thrice. Now if, for example, we want it to multiply by 7. The digits in both hands need to be multiplied by 7. This will make 49 in left hand and 56 in right hand. Say three times in your mind 49, 56. This is to ensure that you do not forget these numbers 49 and 56 to be there in your left and right hand respectively. Now we will also remember that right hand should have only one digit. So only unit digit 6 from the number 56 will remain there in right hand and 5 of 56 will be carried to left hand to get added there in 49. On adding of 5 to 49 mentally, the number in left hand becomes 54. So the left hand 54 and right hand 6 will make the answer 546.

We will take three more examples to make this process very clear in our mind. The process is useful when we do not

*have a piece of paper and the answer is expected verbally. Let us take three examples as 67*9, 73*6, 91*5*

Example 1 (67*9):

6 in left and 7 in right (keep it in mind 6 in left, 7 in right)

Now both to be multiplied by 9

So, 54 in left and 63 in right (repeat in your mind thrice 54 in left 63 in right to avoid mistake)

Now right hand has to have only one digit so 6 of 63 is carried to left hand to get added in 54 to make a total of 60 in left hand. Since right hand digit is single now with the number 3, the answer will be 603.

Example 2 (73*6):

7 in left 3 in right (repeat in mind 7 in left 3 in right)

Now multiplication by 6 to the numbers in both hands will yield 42 in left and 18 in right (repeat in your mind thrice (42, 18))

Right hand has to have a single digit therefore the unit 1 of 18 will go left to get added in 42 to make it 43. Now we have 43 in left and 8 in right to make the answer 438.

Example 3 (91*5): Visualize 9 in left and 1 in right (Repeat in mind 9 in left 1 in right)

Multiplication by 5 will yield 45 in left and 5 in right. Since there is only 1 digit in right the answer comes straight as 455

The process is simple and paperless, except that we have to visualize in our mind with the help of our two hands.



Author is ME (Elect. Engg.) , PGDBA with more than four decades of years experience in power sector from engineering, R&D, administration. Despite being engineer he did make his career in Finance and retired as Director (Finance). He has been mentor of the Coordinator, Gyan Vigyan Sarita, during middle of 70s until Y2K. Post superannuation he has settled at Bhopal.

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The value of a college education is not the learning of many facts but the training of mind to think.

- Albert Einstein

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लक्ष्य...

लक्ष्य तुम्हारा दूर सही
हो, फिर भी अगम्य नहीं
धैर्य व साहस है साथ में
ज्ञान कोष जब है हाथ में
यह संकट भी टल जायेगा
अमन चैन का पल आयेगा
मन में रखना यह विश्वास
पूरी होगी सारी आस।

साध्य...

अपने पथ पर दीप जला
दूजे की राहें रोशन कर
अपनी झोली में फूल झरें
औरों के घर भी गुलशन कर
अनगिन आशीष मिलेंगे जब
खुशियों के द्वार खुलेंगे तब
यही लक्ष्य हो हर मन में
यही साध्य हो जीवन में।



कवियत्री एक सामाजिक चिंतक एवं विचारक हैं। आपकी कविताएँ वर्तमान पर्यवेक्ष्य में बुद्धि-जीवियों को उनके सामाजिक उत्तरदायित्व के प्रति उन्हें चिंतन के लिए प्रेरित करती हैं। आपकी लेखनी प्रादेशिक एवं राष्ट्रीय स्तर पर प्रकाशित है।

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मृणालिनी घुले**सिर्फ एक ही पहचान****डॉ. संगीता पाहुजा**

ईश्वर एक, नाम अनेक,
पंचमहाभूतों से बना इंसान एक,
किन्तु हैं मजहब अनेक।

धार्मिक आस्था एक, किन्तु
भक्ति स्थल अनेक,
मंदिर, मस्जिद, चर्च और गुरुद्वारे
, मस्तक टेके भक्त अनेक।

नाता है सिर्फ एक
भक्त और भगवान का,
फिर भी रहता है अंतर, है
भक्ति स्थलों के नाम का।

मिट जाता हर अंतर जहां,
न रहता कोई धर्म अनंतर
ऐसा है सिर्फ एक स्थान समानांतर,
रोगी और चिकित्सक का
होता साक्षात्कार रोगांतक।

ना पूछे धर्म, ना पूछे, मजहब
केवल समझे रोग, रोगी का,
रह जाता, सिर्फ एक ही मकसद,
और एक ही पहचान,
किस प्रकार हो, रोगी के
रोग का निदान।।



कवियत्री आयुर्वेदिक चिकित्सक हैं। आपने B.A.M.S. की उपाधि M.D. University, रोहतक से प्राप्त की। आपके दिल्ली एवं नॉएडा में परामर्श केंद्र है। धार्मिक, नारी एवं समाज उत्थान कार्यों में आपकी विशेष रुचि है।

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देश के वीरों को नमन

सविता गुप्ता

स्तब्ध खड़ी है दुनिया सारी,
कहां से आई यह वैश्विक बीमारी ।
भयानक कोरोनावायरस जग में चुपचाप छा गया,

सभी देशों में कोहराम मचा गया।
ना दवाई ना कोई टीका इसका,
केवल सोशल डिस्टेंसिंग ही है इलाज इसका ।

मास्क लगाकर बार-बार हाथों को धोना,
इसके बचाव के केवल साधन यही।
पर ऐसे आपात आज समय में भी,
अपनी हरकतों से बाज नहीं आया पड़ोसी देश।

आतंक का साया गहराया,
ना जाने कितने वीर सपूतों ने प्राण गवाएं ।
स्तब्ध भारतवासी समझ ना पाए कैसी है यह चाल,

जननायक हिम्मत से जनता को समझा रहे,
नहीं चुप बैठेगा बदलता हिंदुस्तान।
लेगा बदला लेगा बतला रहे,
धन्य धन्य हो भारत के वीरों।

हम सब हिंदुस्तानी हृदय में भावों के दीप जलाएं,
हाथों में श्रद्धा के फूल लिए नम आंखों से,
करते नमन आपको बारंबार बारंबार बारंबार।



कवियत्री, एवं में सेंटर मैनेजर तथा न्यू एरा स्कूल, गाजियाबाद में मुख्य अध्यापिका पद पर रह चुकी है। वे सक्रिय समाज सेविका तथा एकता लायनेस क्लब, की संस्थापक है। योग तथा सांस्कृतिक कार्यों में उनकी विशेष रुचि है।

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अदृश्य चेतावनी

नीलमा कपूर

अनायास आक्रान्त हुई यह दुनिया सारी,
कैसे, कहाँ से आई यह वैश्विक महामारी?
भागती सृष्टि पल में स्थिर हो गयी,
उद्योगों में चलती मशीनें रूक गयी।
कार्यालय, बाजार बन्द, सड़के सब मौन,
समस्त विश्व को चुप करा गया कौन?
अदृश्य कोरोना चुपचाप जग में छा गया,
सभी देशों में कोहराम सा मचा गया।
हमारे डाक्टर, सिपाही ड्यूटी पर खड़े हैं,
समस्या बड़ी है, पर जज्बे भी बड़े हैं।
जननायक हिम्मत से जनता को समझा रहे हैं,
हम स्वस्थ रहे, ऐसे कदम उठा रहे हैं।
इन सब ही को एक होकर जिताना है,
भेद भूल कर मानव जाति को बचाना है।
हम सब मिलकर इनको मजबूत बनाएं,
लाकडाउन में ही रहने को सबको मनाएं।
ईश्वर का यह संकेत हमें समझना है,
प्रकृति के इस रहस्य को पहचानना है।
चारदीवारी में ही स्वर्ग है कोरोना काल में,
बाहर निकले तो फंस जाएंगे भीषण जाल में।
घरों में भी बहुत कुछ है हमारे लिए,
सन्तुष्टि ऐसे में ही प्राप्त करने के लिए,
रिश्तों को समझे, नयी कला सीखे सिखाएं,
अपने घरों को ही मिलकर स्वर्ग बनाएं।
समाज और परिवार को संकट से बचाना,
उचित निर्णय लेकर ही है कदम उठाना।



कवियत्री, स्नातकोत्तर उपाधि अंग्रेजी व शिक्षा शास्त्र। विवेकानंद स्कूल में 30 वर्ष सी नियर अध्यापिका के पद पर कार्य किया। सम्प्रति सेवानिवृत्त। शिक्षा के क्षेत्र में दृढ़ भाव व अनुभव। हिंदी अंग्रेजी लेखन में रुचि। समाज प्रेमी। जीवन की पाठशाला में नित्य नया सीखने की ललक। ई-मेल : kkapoor_rakesh@yahoo.com

Answers: Science Quiz- May'2020**Kumud Bala**

1 (A)	2 (D)	3 (D)	4 (C)	5 (A)	6 (D)	7 (D)	8 (D)	9 (A)	10 (A)
11 (B)	12 (D)	13 (B)	14 (A)	15 (A)	16 (B)	17 (A)	18 (A)	19 (A)	20 (A)
21 (A)	22 (A)	23 (C)	24 (A)	25 (C)	-	-	-	-	-

—00—**ANSWER: CROSSWORD PUZZLE, May'2020
(COVID Gyan Test)****Prof. S.B. Dhar**

							1M												
		2H	E	3L	P	Y	O	U											
				U			S										4D		
				N			Q										R		
				G			U			5O							O		
				S			I			T			6D				P		
							T			H			I				L		
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							B			R			B				T		
8C	O	R	O	N	A	V	I	R	U	S			E				S		
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			9T	E	M	P	E	R	A	T	U	R	E						
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—00—

Communication (Computer with Communication capability i.e. internet) has forged the world, which is otherwise fragmented into narrow boundaries, into a global village. All that we need to do is to connect the most deprived persons through strings of education. Communication provides the much needed solution in the form of Virtual Class Rooms.

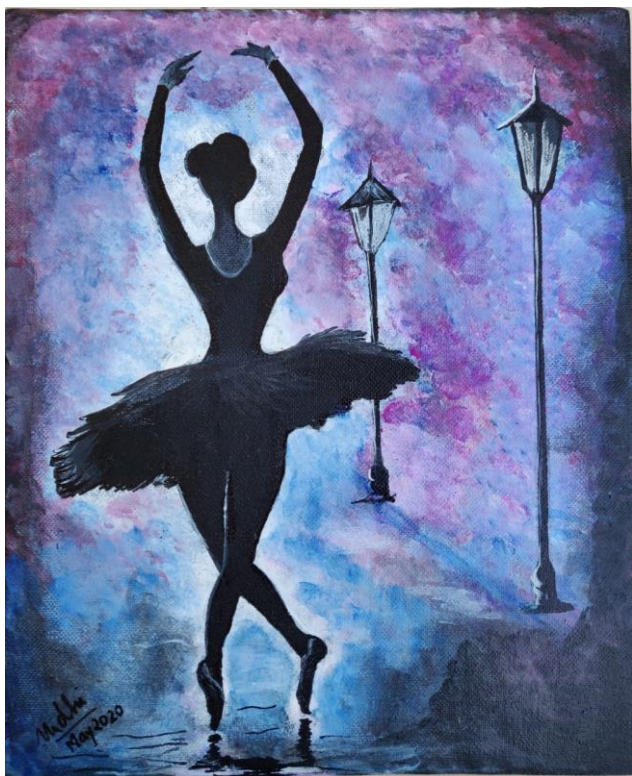
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*Nothing is more important than education,
because nowhere are our stakes higher;
our future depends on the quality of education of our children today.
- Arnold Schwarzenegger*



Mrs. Savita Gupta is M.A., B. Ed. . She was Center Manager, S. D Polytechnic, Ghaziabad, and Head mistress New Era school Ghaziabad. She is proactive social reformer and participant in social, cultural and Yoga activities. She is Founder of Loiness Ekta Club, NOIDA. e-Mail ID: goeltanvi@gmail.com

—00—



Nidhi Joshi is an IT Professional, In addition to drawing and painting, music and cooking are her hobbies.

e-Mail: nidhi.joshi39@gmail.com

—00—

How Best Can Students Utilize Staying Home During Lockdown- COVID-19?

D.V.S Durga Prasad

As a I want to share my personal feelings at this pandemic situation caused by Covid-19.

With the rising number of COVID-19 cases in India, the government of India implemented a lockdown across the nation to check the spreading of the disease. COVID-19 is a virus that spreads from one infected person to another. This step was taken to prevent community transmission of this deadly virus and break the chain of transmission.

The government has issued advisories to all the citizens to practice social distancing and stay at home. Because all educational institutions have been shut down due to the lockdown, students are now left with lots of free time on their hands. But, this doesn't mean you sit at home and let the time pass by. There are numerous ways a student can utilize this time productively and gain something out of it.

In spite of being a teacher, I could not digest the lockdown conditions and upto 28 March, I was in a dilemma. How to spend my time was a big task for me then? But, after groping in my mind for several hours, I got motivated by one of my old students. His words made me think positively and I started using a lion's share of my time at home in learning the technical devices in imparting education to my students. Though I was zero in this, now I am able to manage in using modern tools and techniques.

Later my mind immersed in motivating students in turning up their minds how best they can use this lockdown period. Here are some ideas to help them :

- 1. Planting trees:** You can try your hand at nurturing plants to pass time. Growing plants can give you an opportunity to nurture life and teach you important life skills like patience. There are many types of plants to choose from – the most common ones are tulsi, aloe vera and neem. If you are planning to grow plants on your terrace, then opt for smaller potted plants like aloe vera and tulsi. If you have garden space, then you can opt for bigger plants like neem, mango etc.. You can also grow vegetables at home and ensure a supply of organic vegetables for your kitchen. This habituates the 35 crores (nearly) of students in all-over India to pass a message against Global Warming.
- 2. Learn painting:** Gather all your paintbrushes lying unused since childhood. If the painting wasn't your thing in childhood and you don't have paintbrushes, then you can also use plastic spoons, visiting cards or

your hands. There are many websites that suggest painting ideas for the day. You can set aside an hour every day and experiment with these ideas. Painting can be a therapeutic activity as it calms your mind when you focus on painting.

- 3. Practising yoga:** Thus is the perfect time to get started yoga. Yoga is a form of exercise that includes slow movements and stretching to enhance your strength, stamina and flexibility.
- 4. Enrol into online courses:** You don't always have to be physically present in an educational institution to learn something. Thanks to the internet, you can now also take up courses with the comfort of your home. Many institutions in India and abroad provide courses, tutorials and videos for a wide range of subjects online. You can use this time to take up online courses and enhance your existing knowledge.
- 5. Build on your family relationships:** If you are one of those students who stay away from home due to studies, and if you are back home now, then this is your chance to strengthen your relationships back home. One way to do that is by bonding through activities – such as reading books to your grandparents or helping your parents in their chores like a cooking, gardening or cleaning.
- 6. Read books:** A good book can transform you so don't wait! There are many good books you can find online. If you can't decide which book to buy then you can consider these all-time classics viz. The Harry Potter series, Ruskin Bond collection, Amar Chitra Katha, Panchatantra, Mark Twain's collection, Verhaal Stories.
- 7. Play board games:** Did you love playing Ludo when you were a kid? Take the Ludo board out and start a game with your family members. If there are few members in your family, then you can opt for games like chess. These board games are not only fun and engaging, but they also offer an opportunity to sharpen your cognitive skills.
- 8. Create a collage:** If you have countless photographs on your smartphone, then this is a good activity for you. All you need is a printer and some printing paper. All you have to do is print out your favourite photographs on a paper and then cut them out. Take any cardboard box like an old shoebox or a garment box to prepare your cardboard base. Once the base is

ready, paste the photographs on it and voila! Your collage is ready. You can add glitter or make doodles on the collage if you are in the mood for some fun.

Such activities can make a person complete and utilize the opportunity, God forbid!! It recurs.



Author is a dedicated teacher of English at R.K.Mission School, Sitanagaram, A.P. He is coordinator for Interactive Online Mentoring Sessions (IOMS) being held at the school. In addition to teaching, he is passionate about grooming children as good human being.

E-mail: prasaddevulapalli2@gmail.com

—00—

Collective Effort



**Initiative of Shri D.V.S Durga Prasad, at RKM School, Sitanagaram, A.P.,
to
Keep Students Together, while Stay at Home for a Common Cause**

—00—

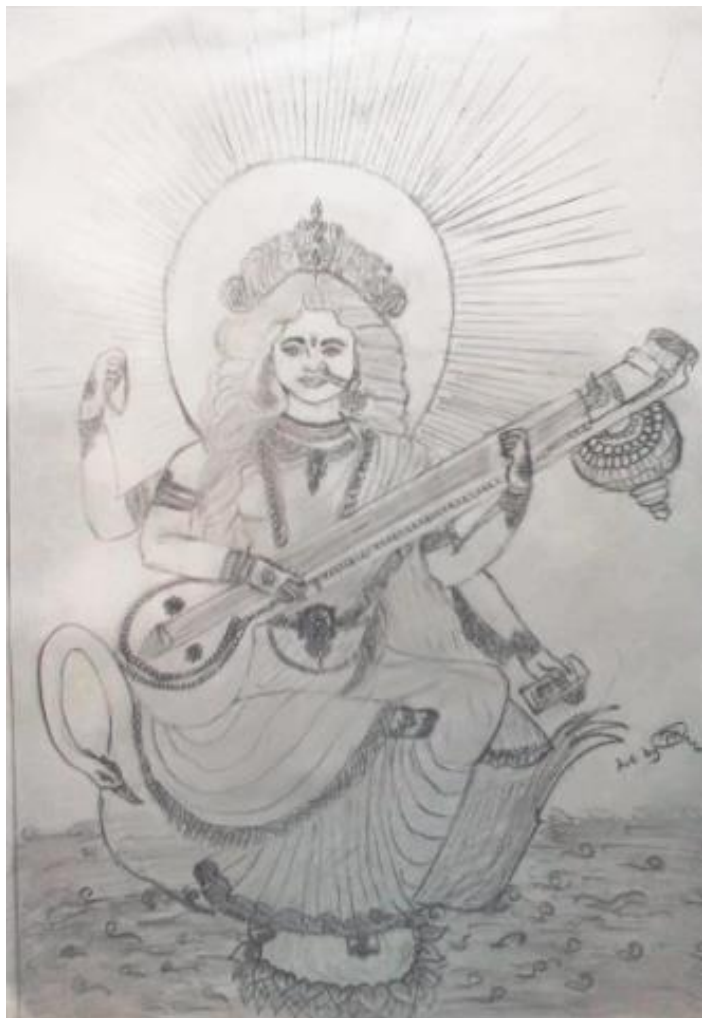
Creativity is Contagious!!! Pass It On....



1. Birbhadra, 2. Abhisekh, 3. Porinita, 4. Bharti Jha, 5. Abhisekh, 6. Neha, 7. Deepanjana Roy, 8. Dhriti Rani Das, 9. Priyanshi Yadav, 10. Angel Hans, 11. Deepshikha Dingia, 12. Khusbu, 13. Priyanshi Yadav, 14. **Jyoti Sharma (Mentor-Teacher, Maths)**, 15. Jasmin Ara

@ Kendriya Vidyalaya, Dinjan, Dibrugarh, Assam

—00—



M. Pawan, is a student of Class X at RKM School Sithanagram, A.P. He is attending IOMS at the school since class IXth. Drawing is his hobby.



Shiv Rama Krishna, is a student of Class X at RKM School Sithanagram, A.P. He is attending IOMS at the school since class IXth. Drawing is his hobby.



Hand Casting

Anupra Dubey

Hand Casting is beautiful Clay Art. It looks pleasant. It is all unique. It takes 3- 4 minutes to cast. For this model, I have used Molding powder, Casting stone, Sandpaper, De-molding stick, Plastic base, and a golden paint to paint the dried casting.

This casting says that Strength is in Unity. It says that if we are together, we are Strong enough to face any crisis be Covid-19.



She is a student of Class 5th in Indian Public School, Rohini. Creative work is her hobby.

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A Sai Kiran is a Student of Class Xth at RKM School Sithanagram, A.P. He attends IOMS at the school and is continuing it from class IXth. Drawing is his hobby.

—00—



Navya Nayan, is a student of class 5 at Birla Vidya Niketan, Delhi. Drawing and music is her hobby



Mannan, is a student of class 4th at Birla Niketan, Delhi. Drawing and music is his hobby.

—00—



Deepanjana Roy is student of Class 9th at Kendriya Vidyalaya at Dinjan, Assam. She is a participant of Online Session under IOMS. Drawing, music and cooking are her hobbies.



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Astronomy

Harshita Mishra

Humans have always been curious to know about the universe around them. Astronomy helps people to know about the mighty universe.

Astronomy is a natural science that studies celestial object and phenomenon. It uses Mathematics, Physics and Chemistry. Objects in research are moon, planets, stars, nebulae, galaxies, and comets. The main work of astronomy is to explain puzzling features of universe.

Astronomy is one of the oldest sciences. Ancient people used the positions of the stars to navigate, and to find when was the best time to plant crops.

Early astronomers noticed patterns in the sky and attempted to organise them in order to track and predict their motion. Known as constellations, these patterns help

people of the past to measure the seasons. The movement of the stars and other heavenly bodies was tracked around the world,, but was prevalent in China ,Egypt, Greece, Mesopotamia ,Central America and India.

Since 20th century, there have been mainly two types of astronomy, Observational astronomy and theoretical astronomy. Observational astronomy uses telescopes and cameras to observe stars, galaxies and other heavenly objects. Theoretical astronomy use mathematics and computer models to explain the observations and predict what can happen.

Humans have been always interested to know about the universe around them and astronomy helps is to know more about it.



Author is a student of class IXth at Army Public School, Dinjan, Assam. She is a participant of Online Mentoring through IOMS at the Her hobbies are Playing chess, practicing Taekwondo & playing keyboard.

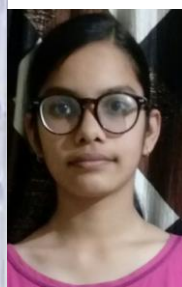
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Akanksha Kashyap is a Student of Class Xth at Army Public School, Dinjan, Tinsukia District, Assam. She is attending IOMS since Nov'2019. Drawing, writing, singing, dancing, playing basketball and volleyball are her hobbies.



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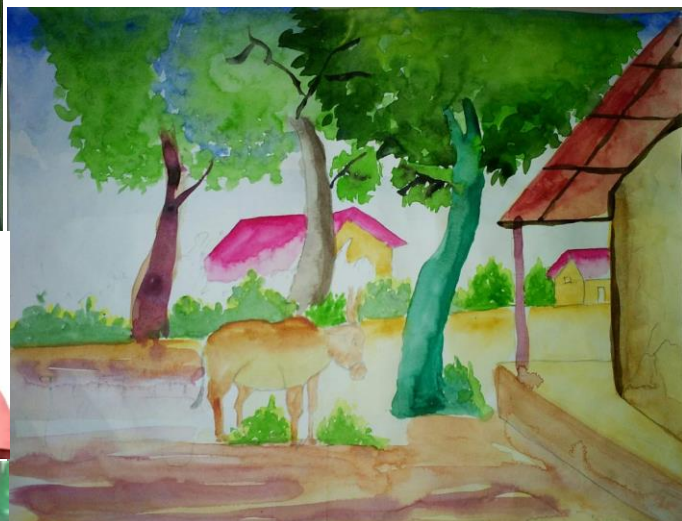


Nidhi is a Student of Class IXth at Army Public School, Dinjan, Tinsukia District, Assam. She is attending IOMS since Nov'2019. Drawing, writing songs and dancing are her hobby.

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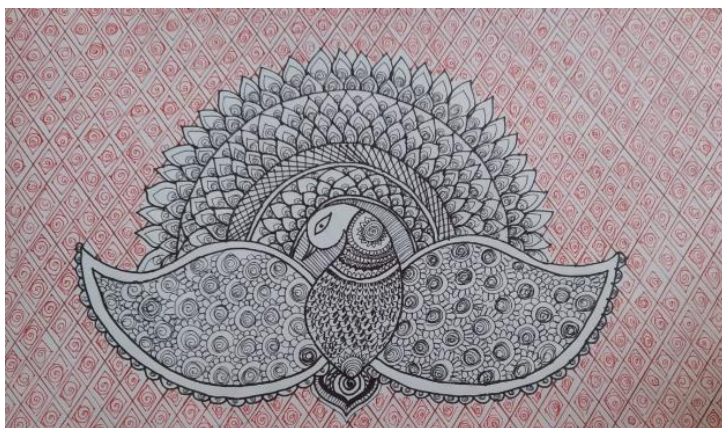


Kaushik Sharma is a Student of Class IXth at Kendriya Vidyalaya, Dinjan, Tinsukia District, Assam. She is attending IOMS since Nov'2019. Drawing is his hobby.



Trisha Samal is a Student of Class IXth at Army Public School, Dinjan, Tinsukia District, Assam. She is participating in Online Sessions under IOMS. Drawing, singing and writing are her hobbies

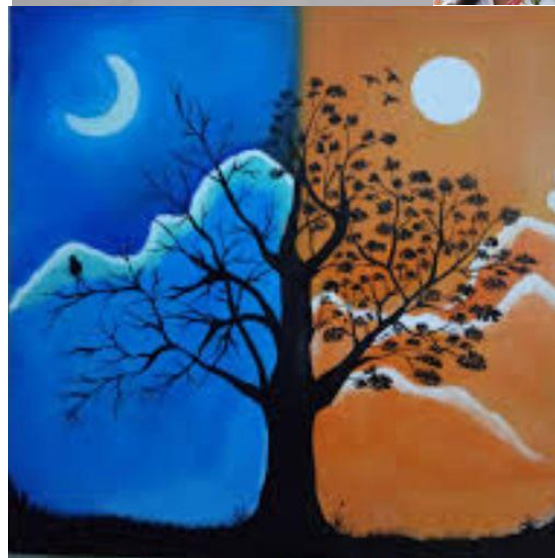




Abhishek Shaw is a Student of Class IXth at Kendriya Vidyalaya, Dinjan, Assam. He is participating in Online Sessions under IOMS. Drawing and writing is his hobby.



Rashmirekha Shaw is a Student of Class XIIth (PCB) at Kendriya Vidyalaya, Dinjan, Assam. Drawing and writing is her hobby.



Then and Now

Natchya Tiwari

Once upon a time, there lived a kid named jenny. She was from past. There was another kid named jack who was from future. Both were friends. One day, they both planned to share about what they did in a day of their life.

First the kid from the past told about how she played. She told, "I usually played with my friends outdoor. We played hide and seek and sometimes we played board games together. How about you?"

Then jack told her, "You guys are so boring. We play so many games online and we play it all day." Then jenny told him, "Don't you hurt your eyes and doesn't your mother dispraise you?" So, he told her, "I do like this every day, so I'm accustomed and yes my mother is always angry with me but who cares. I just shout at mom back."

Then she told him, "That's so bad and don't you study?"

"No, who studies?" Jack told her. "We study" she said and asked him, "If you don't study then what are you going to be in future?"

"Anything that gives a lot of money, because I want to be rich, and you?"

"I'm going to be a doctor or take any job that gives respect and a good salary to take care of my family", she said.

From the story who do you think will be successful in the future?



Moral of the story

We must listen to our parents and respect them.

We must study for our future and for a good life.

We must use mobile phones and computers reasonably.

We must divide our time well for all necessary activities.

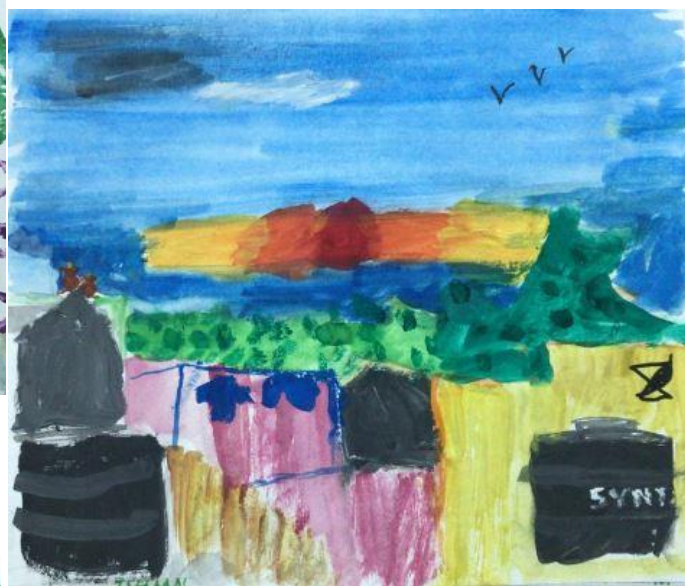


.Author is a student of CRM School in Chiangrai (Thailand). She studies in standard 9. Her hobbies are swimming, playing basketball, badminton & bicycling. She loves reading books. She is fond of writing short stories. She believes that one should always live by the rules because staying with the rules generates discipline. Discipline is very necessary for the students.

—00—



Ishaan Shrivastava is a student of class 3 at Birla Vidya Niketan, Delhi. Drawing is his hobby.



Managing Development

D .Naga Divya

Being busy in the race of development, people forgot the attachment with nature.

This led to an increase in temperature and pollution. So Paris came up with an agreement on **12th December 2015** to reduce global warming which is called the '**Paris climate agreement**'.

Our average global temperature is increasing almost 2 degrees decade to decade due to release of **greenhouse gases**(CH₄, CO₂, and more poisonous Sulphates and Nitrates) and high use of fossil fuels(Petrol, Diesel). This may cause an unusual melting of polar ice caps which results in the increment of Mean Sea Level(MSL), flooding the coastal areas. All these disturb the environmental chain which leads to many natural disasters. So Paris decided to adopt an agreement in 2015 to decrease the average temperature by **2 degrees and to pursue efforts to limit the temperature increase to 1.5 celsius or less**. In order to fulfil this agreement, our world should face challenges like 'maintaining global development followed by climatic sustainability', 'making financial stability' etc.... There may be rifts between developed and developing countries due to imbalance in the maintenance of financial issues. According to a survey conducted, on an average, **2.57 million pounds of carbon dioxide is emitted into the atmosphere every second**. We may think it's useless to pay attention to global warming but its high time to change our notion regarding our nature. We can't imagine the consequences of global warming. This alarming rate of increase in global temperature will take away the lives of many people. So it's our responsibility to bring back the climate on earth as like as pre-industrialization period.

Nineteenth-century, the beginning of the industrial revolution has transferred our world into a new technological era which led to the emergence of many industries resulting in the dangerous outcomes like Global warming. At present global warming is the most debatable issue. Global temperatures have been increasing day-to-day since the industrial revolution. It is very important to end this issue which will be fatal to mankind otherwise. Hence Paris came up with a great strategy to reduce the increasing global temperatures.

The central aim of this agreement is to reduce global temperatures by reducing the emission of greenhouse gases. But it is not as easy as we talk. Each and every nation has to contribute in its own way as it is a global problem. So the Paris agreement has come up with many aims which are to be achieved. But in reality, it is impossible for developing countries to achieve such goals. So they need support from a developed nation.

Emitting a huge amount of carbon dioxide and burning a large amount of fossil fuels and deforestation are the major causes of global warming.

Over the 15 years, there will be a need for \$90trillions for the development of infrastructure. For a low carbon economy more than \$100trillion massive investment is needed but to accelerate this strong government policy and participation of Multilateral Development Banks are necessary.

Developed countries like USA, France, Japan have all the infrastructure and income so now they can start their way towards protecting the environment but the developing countries like India and underdeveloped African countries may not go beyond development for protecting nature. Because developing countries need infrastructural development and finance. Even if they start implementing environment protection measures they may not sustain too long due to their financial instability. But countries like India has stepped forward to protect the mother earth.

Whatever be the circumstances we should contribute towards reducing the global temperatures. We need to attain all the ambitions of the Paris agreement which reduces the usage of fossil fuels and the average global temperature by 2 degrees. We need to maintain climatic sustainability driving through the development of every country morally and financially (which is a tough task for developing countries!!!).

While implementing these there are some key obstacles:

- Financial issues between developing and developed countries
- Government and people participation
- High emission of fossil fuels
- Development goals

Even if we are controlling climatic changes by overcoming all the obstacles there may be some other problems like reaching goals within the expected time, stabilizing the conditions after reaching the goal and transparency to achieve infrastructural and financial goals for developing countries.

Conclusion: To deliver the necessary changes **high carbon pricing** is needed which can enhance the low emission of greenhouse gases

Strict laws should be made by the authorities in every nation to reduce the GHGs (greenhouse gases) emission.

Reducing Global Temperature is the main aspect of the Paris agreement which can be done through some smart ways of using **renewable sources** of energy. **Sunlight**, the major source of energy should be used in industries and in

major power plants. To implement this kind of changes in developing countries may not be possible as they can't

afford it. So developed countries should give their support and encourage developing countries in doing so.

**“Together we can achieve anything”
“We can save our earth”**



Author is a student of class IXth at Ramakrishna Mission High school, Ssitnagaram , A.P. She is participant of online sessions, IOMS, being held for students of the school. Writing is her hobby.

—00—

गुरु

परिभाषा गुरु की कोई न जानी,
जाने वही जो है सच्चा ज्ञानी,
गुरु दाता है ज्ञान कोष के,
याचक हम हैं उसी ज्ञान के |
तन , मन , धन है उन्हें समर्पित,
करते उन्हें हम हर साँस हैं अर्पित,
करते जो गुरु का अपमान,
कभी न मिलता उनको सम्मान |

School Rules

Come to school just in time,
Go for prayer in a line ,
Don't throw paper on the ground,
Give the teacher what is found,
Come to school neat and clean,
Wish the teacher when you meet,
Bring your lock and bring your key,
Don't forget to pay your fee,
Do your homework every day,
In your class you must not play,
when you go out or the class,
Don't forget to take your pass,
Follow! Follow! every rule,
If you are study in a school.



रश्मिरेखा शॉ कक्षा 12 वीं की केंद्रीय विद्यालय दिनजान, असम, की छात्र है। ड्राइंग एवं लेखन इनकी रूचि है

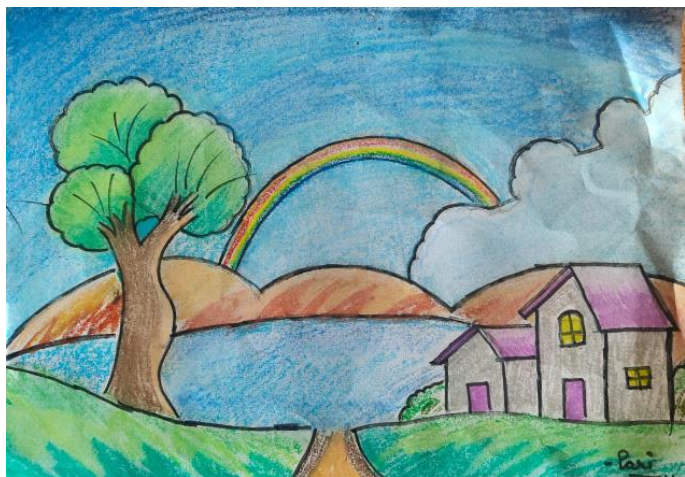


Abhishek Shaw is a Student of Class IXth at Kendriya Vidyalaya, Dinjan, Assam. He is participating in Online Sessions under IOMS. Drawing and writing is his hobby.

—00—

Inetellectualism is not about criticizing or advising without any responsibility of implementation; it is about taking upon responsibility of actions for the larger good.

—00—



Presha Gupta, studies in Class IVth at Apeejay School, Noida. Drawing is her hobby.

—00—

Examination Fever

Jui Deorankar

The clock struck four,
And I got up in a very big roar,
Study study study was the only hobby,
No one was allowed to run in the lobby

The clock struck two in the night,
I was still on the table holding my books tight,
Sleep trying to get into my eyes,
But I fought by telling myself lies.

The day came and I got ready,
To show everyone that I did noting else but study,
I wrote and wrote,
Till my hands got sore.

I got home with a smile,
And told myself everything was fine,
In a few minutes my friends showed up,
And I vanished with them in a single hop.



She is a student of Class Xth at Army Public School, Dinjan, Assam. She has been attending IOMS since session 2019-20, and continuing with Online Session held under IOMS. Writing, music sports are her hobbies

—00—

UNITY IN DIVERSITY IN INDIA

M.Hari Chandana

Unity in diversity is used as an expression of harmony and unity between dissimilar individuals or groups. It is a concept of unity without uniformity and diversity without fragmentation that shifts focus from unity based on mere tolerance of physical, cultural, linguistic, social, religious, political, ideological and /or physiological difference towards a more complex unity based on an understanding that difference enriches human interactions. The idea and related phase is very old and dates back to ancient times in both Western and Eastern Old World cultures. It has applications in many fields including, cosmology, physiology, religion and politics.

India has many races , castes , sub-castes , nationalities and communities , but the heart of India is one, a country of many ethnic groups, is a land of myriad languages, numerous modes of apparel .Besides, there are several religions, sects and beliefs .But there are certain common links and uniting bonds that people have sought to develop in order to achieve the eminently desirable goal of unity amidst diversity. Even the early Indian history unmistakably shows that the political consciousness of the people has from the very early times grasped the whole of India as a unit and assimilated the entire area as the theatre of its activities. India is not a mere geographical expression, nor is it a mere collection of separate peoples, traditions and conventions. India is much more than this. The best proof lies in the fact that Indian history has quickened into life.

We are all heirs to a common and rich culture. Our cultural heritage consists of our art and literature as they flourished

centuries ago. Our cultural heritage serves as a bond of unity between people of different faiths and creeds. The streams of different cultures have flowed into our subcontinent to make us what we will be.

India has one hundred and fifty dialects and twenty-two recognized languages, but Hindi, like English, has come to stay as the lingua franca of our nation.

India has a rich cultural heritage. We are inheritors of several grand treasures in the fields of music, fine arts, dance, drama, theatre and sculpture. Our sages and seers have left behind a tradition of piety, penance, spiritual, greatness, conquest of passion, etc. Our scriptures are the storehouses spiritual wisdom. Our saints aspired to the realization of infinite. We have inherited great spiritual values.

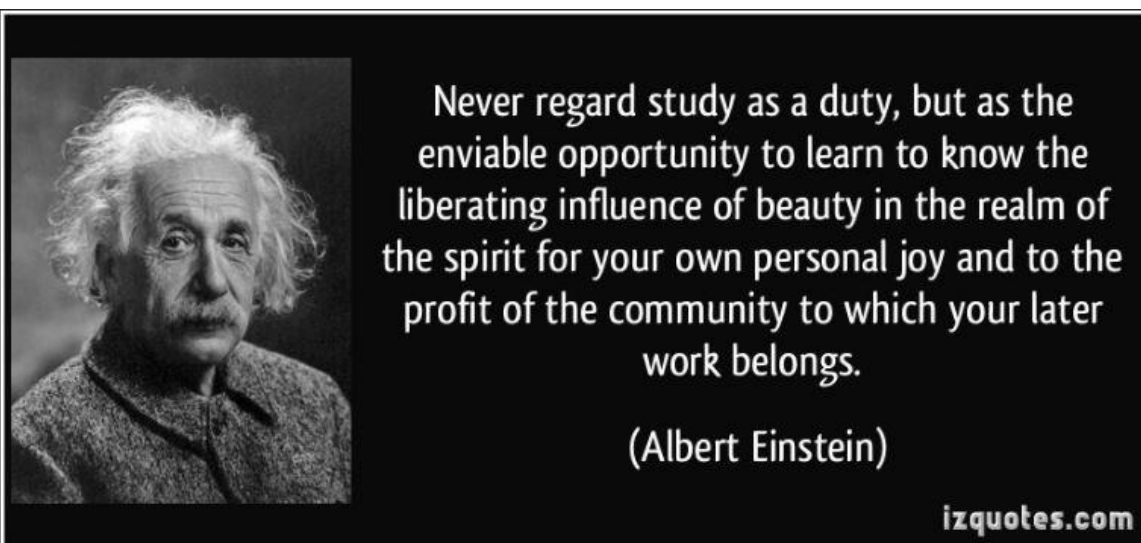
India yogis and maharishis, musicians and spiritual leaders have all attracted them in a big way. A significant move to project India's cultural unity has been the holding of Festivals of India in various parts of the world.

Indian classical music, like in the Indian dances, is built on the concept of Ragas and Talas. Other significant features of India's cultural Unity are the variety, colour and the emotional richness of its dances. The country abounds in tribal dances, old dances as well as classical dances of great virtuosity. Throughout India, Dance is regarded not nearly as an accompaniment to social intercourse, but also as a mode of aesthetic expression and spiritual their realization.



Author is a Student of Class IX at RKM School Sithanagram, A.P. He attends IOMS at the school and is continuing since class IXth. Writing is her hobby.

—00—



Best Practices for Schooling-from-Home

Dishita Joshi

After more than a decade of schooling for me and my friends, we were for the first time forced to do schooling from home. There were no buses to queue up for, no one to laugh along with during school. It was a whole new thing for us. We were forced to study in this environment. There were new challenges that people had to work with. So, after two months of online schooling, here are some of my learnings to make it more effective.

Discipline: it is very important for us, the students, to maintain discipline, especially in this time frame because there is no one to govern or control us. Small little things like wearing uniform or even doing our work at a proper place (study table) take us a long way and make our studies effective.



The author, drawing is by a student of class 9th, The Khaitan School, NOIDA. Her hobbies include playing tennis, swimming, learning music and drawing/painting

e-Mail ID. joshihp@gmail.com

Learning Technology and Softawre Tools: Right from attending the classes to submitting our assignments, everything is done through software. Thus, it is extremely important for us to have an open mind towards learning these quickly.

Last, but not the least, it is also very important to be considerate towards and supportive of our teachers as they put a lot of work, effort, and time in making our online studies effective and fruitful. Lockdown was imposed suddenly, and without any prior training, they have shown an amazing commitment. So, as students, it is our responsibility to appreciate their efforts and be supportive of them.





Mobile Stand- Origami



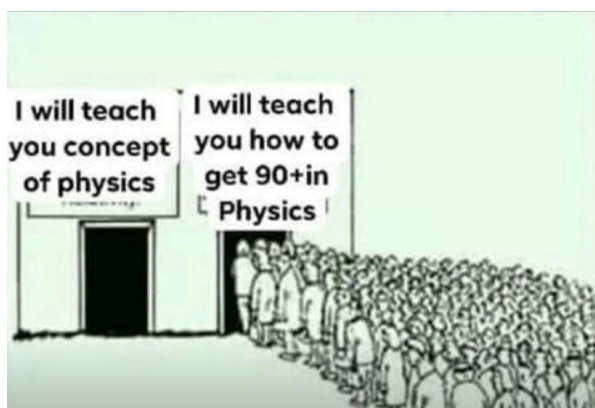
Anura Joshi is a student of Class IInd at The Khaitan School, Noida. Creative works is her hobby

—00—



Krittika Dwivedi is a student of Class 3, Brigade School, Mahadevpura Bangalore. Drawing is her hobby.

—00—



Economic Condition of the World

G. Sriram K.H. Kumar



These are the top most countries images as per the economy. The people decide the greatest country by the country's GDP and economic condition. The Top 5 countries as per the economy:

- 1.America
- 2.China
- 3.Japan
4. Germany
- 5.England

These are the top 5 countries in the world as per the economy. India is ranked no:6 on the scale of economy. Nowadays all countries are developing very fast as per the economy.

GDP of the top 5 countries is as under –

- 1.United States of America – 20.49 trillion
2. China – 13.47 trillion
3. Japan – 4.97 trillion
4. Germany – 4 trillion
5. England. -2.83 trillion.

India's GDP is 2.57 trillion. Nowadays all countries are focusing on developing their economy.

Country's rate of development is judged on rate of growth in GDP. America is the greatest super power as per the economy and also GDP, with its economy of 20.49 trillion.

India is also developing very fast as per the economy. To develop fast India is looking to save India from black money, export and import services in 2019 is estimated as 19.44 billion dollars. India increased its import and export services by the percentage of 22.37. This is an indicator of rate of the country's development.

All this is before the January 2020 before arrival of the deadliest virus Corona. It is pandemic. It has brought economic development to a halt.

Measures taken to control this pandemic is social distancing though lockdown. All countries decided to follow India's action plan Lockdown means there is no allowance to any work or any person other than -

- 1.Doctors
- 2.Sanitization workers
3. Police

Government of India develops it's country by collecting taxes from Bus transport, Rail transport and air transport and all other commercial activities. But, in absence of commercial activities revenue collection has decreased, and

thus badly affecting economic condition of country as a whole.

A huge loss because of lockdown on account of transportation is -

Road transport: 178.56 crores

Rail transport: 21 .3 billion

Air transport: 24 .57 billion

The factories also closed. Global economy has downgraded to 3 percent. Before, December 2019 the worst global economic recession took place in 2008 due to another deadly virus Influenza. In the year 2008 the economy downgraded too 2.8 percent. Corona virus has crossed record of even Influenza.

It's very dangerous to India because it is in debit to World Bank worth 2.247 billion dollars.

Economy of the great super power America. is also in very dangerous position; it is worst affected by Corona. As a result, America's GDP has downgraded to 4.8 percent. In America staggering 29.5 million jobs were lost because of corona virus.

Now the China is ranked no 1 economy in the world worth 20.46 trillion dollars followed by America -20.37 trillion dollars and then India at – 15.2 trillion dollars.

Economy loss during 2020 would affect economic loss in 2021: World will lose around 9 trillion dollars in 2021 because of the effect of economic loss during 2020. This would result in -

1. Land cost rises.
2. Taxes will be raised.
3. Unemployment increases.
4. Economic loss around 9 trillion dollars.
5. Travelling rate also decreases.

In India 15.7 crore jobs are lost due to lockdown.

India's GDP downgraded to 1.5 % in 2020. India's plan of action to recover economic loss:

1. Increase land cost.
2. Increase petro rates.
3. Increase Current bills.
4. Increase transportation charges.
5. Up-increment of collecting taxes.

These all will be a great burden to a common man. But, this is a better plan of action to recover the economic condition.

My suggestion to improve economic conditions are -

1. Collect 10% of taxes from business man and who earns more than 10 lakh rupees.
2. Increase movie tickets rates.
3. Increase electronic gadget rates.
4. Collect more taxes from factories.
5. Increase the cost of furniture.

Hope our economic condition will be increased soon. Government of India are looking forward to recover the Indian economic condition. Each one of us must take forward steps in this direction to help the government

Stay home, stay safe, keep learning, keep growing and help others to grow

(This article is a compilation from web-resource and newspapers)



The author is student of class 9th, of Ramakrishna Mission School, Sitanagram, A.P. He is participating in Online mentoring through IOMS. Writing is his hobby.

—00—

Education breeds confidence; Confidence breeds hope; Hope breeds peace.

- Confucius

—00—

I learnt an invaluable lesson from Lamp; Worth of a person is as long as it helps others Stay Illuminated; What it can is an InsurancePolicy; Rest all is Liability.

—00—



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*Growing With Concepts - Mathematics***LET'S DO SOME PROBLEMS IN MATHEMATICS-XX****Prof. SB Dhar**

MATHCOUNTS is a national program, in the United States, that provides students in grades 6-8 the opportunity to compete in live, in-person contests against and alongside their peers. There are 4 levels in this Competition Series: (a) School, (b) Chapter (Local), (c) State, and (d) National. The competitions are quite challenging. The subject matter includes Geometry, Counting, Probability, Number Theory, and Algebra.

The standard MATHCOUNTS competition contains four rounds: (a) Sprint, (b) Target, (c) Team, and (d) Countdown. In the Sprint Round, contestants solve a Written Exam consisting of 30 problems with a time limit of 40 minutes. The Target Round contains eight problems, presented in four pairs of two. Students have six minutes to work on each pair of problems. The Team Round is a ten question exam which teams of four have twenty minutes to complete. The Countdown Round is a fast-paced head-to-head competition. It is the only oral round.

Scholarships are awarded to high-ranking students at the national competition, and many universities give scholarships to the top finishers at the state level.

MATHCOUNTS was started in 1983 by the National Society of Professional Engineers, National Council of Teachers of Mathematics and CAN Foundation to increase middle school interest in mathematics. The first national-level competition in the modern format was held in 1984. Since then, a national MATHCOUNTS competition has been held annually, but this year in 2020, it will not be held due to Covid-19.

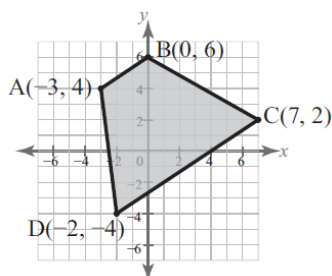
Some questions have been selected for the readers to understand the standard of the questions. In my opinion, the standard of the questions is really appreciable for the grade 6-8.

QUESTIONS

Q1. How many of the first million positive integers share no common factors greater than 1 with 2020?

Ans. 396, 040 integers

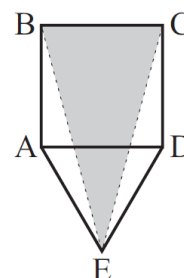
Q2. What is the area of the quadrilateral ABCD as shown?



Ans. 52 units²

Q3. In the figure, square ABCD has side length 6 feet, and E is a point in the exterior of the square such that ADE is equilateral. How many square feet are

in the area of shaded triangle BEC? Express your answer as a decimal to the nearest tenth.



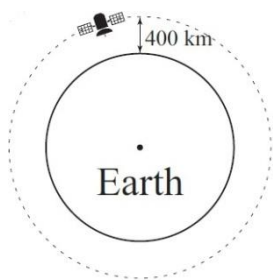
Ans. 33.6 ft²

Q4. How many distinct positive integers can be expressed as $n=ab$ for integers such that $1 \leq a \leq 10$ and $1 \leq b \leq 10$?

Ans. 42 integers

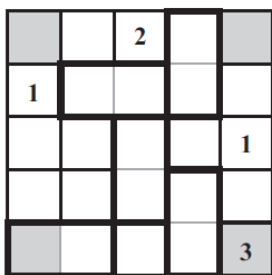
Q5. A satellite located 400 km above Earth's surface, travels at a speed of 28,000 km/h. for simplicity;

assume that Earth is a perfect sphere with circumference 40,075 km. How many minutes does it take the satellite to orbit Earth one time? Express your answer as a decimal to the nearest tenth.



Ans. 91.3 minutes

Q6. In the 5x5 grid shown, each row and each column is to contain the integers 1 through 5 exactly once with one integer per cell. The sum of the two integers in each outlined pair of cells is 5. What is the product of the integers in the four cells that are shaded?

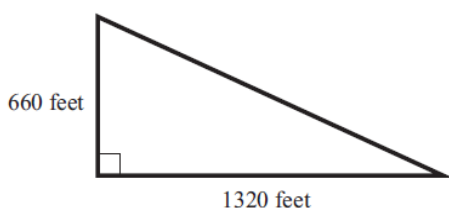


Ans. 144

Q7. How many ways are there to arrange the four integers 1, 2, 3, and 4 in a row so that no two adjacent numbers have a sum of 5?

Ans: 8 ways

Q8. Rosie grows 160 bushels of corn per acre in a right triangular field, as shown, with perpendicular sides of lengths 660 feet and 1320 feet. Given that an acre equals 43,560 ft², what is the total number of bushels of corn that Rosie grows?



Ans. 1600 bushels

Q9. A standard six-sided die is rolled five times. What is the probability that the five rolls are either all the same or all different? Express your answer to the nearest hundredth of a percent.

Ans. 9.34%

Q10. If (0,0), (6,2), (-2,6) and (a,b) are the vertices of a parallelogram, what is the least possible value of a+b?

Ans. -4

Q11. What value of x yields the minimum value of the sum

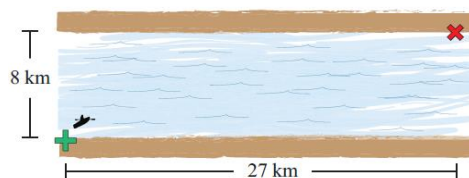
$$|x - 2^0| + |x - 2^1| + |x - 2^2| + |x - 2^3| + \dots + |x - 2^{10}|$$

Ans. 32

Q12. A cylinder whose height is 3 times its radius is inscribed in a cone whose height is 6 times its radius. What fraction of the cone's volume lies inside the cylinder? Express your answer as a common fraction.

Ans. $\frac{4}{9}$

Q13. Ursula's starting location (+) is on the shore of a river that measures 8 km across. Her destination (x) is 27 km downshore on the opposite side of the river. Ursula rows a boat in a straight line, at a speed of 5 km/h, to a point that is 6 km downshore on the opposite side, and then runs the remaining distance, at a speed of 14 km/h. How many hours will it take Ursula to reach her destination? Express your answer as a mixed number.



Ans. $3\frac{1}{2}$

Q14. Gracie has made 2 gallons of punch that contains 50% juice. After Gracie pours out some of her mixture and replaces it with an equal amount of pure 100% juice, she has 2 gallons of punch that

contains 65% juice. How many gallons of the original mixture did Gracie pour out? Express your answer as a common fraction.

Ans. $\frac{3}{5}$ gallon

Q15. If two standard, fair 6-sided dice are rolled, what is the probability that the product of the two numbers rolled is a perfect square? Express your answer as a common fraction.

Ans. $\frac{2}{9}$

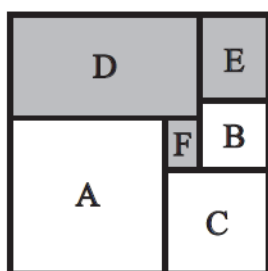
Q16. The lines given by the equations $y = 9 - \frac{1}{3}x$ and $y = mx + b$ are perpendicular and intersect at a point on the x-axis. What is the value of b?

Ans. -81

Q17. If a fair coin is tossed four times, what is the probability of it landing heads up at least three times? Express your answer as a common fraction.

Ans. $\frac{5}{16}$

Q18. The square labeled A has area 81 units². The square labeled B has area 16 units². The square labeled C has area 36 units². These three squares along with the shaded, non-overlapping rectangles labeled D, E and F are arranged to form a large square as shown. What is the area of rectangle D?

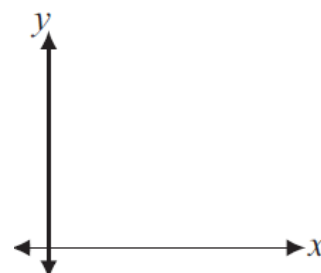


Ans. 66 units²

Q19. What is the absolute difference between the mean and median of the first 100 positive integers?

Ans. 0

Q20. What is the area of the region in the first quadrant that lies between the lines $x + 3y = 12$ and $x + 3y = 18$?



Ans. 30 units²

Q21. Triangle ABC has an area of 40 units². Point D is on side AC, and AD:DC = 3:1. What is the area of triangle BDC?

Ans. 10 units²

Q22. Parker has three sons: Alfred, Beto and Dell. When Alfred turned 11 years old, Beto was 9 years old and Dell was 4 years old. What was the average of their ages when Alfred turned 37?

Ans. 34 years

Q23. A bicycle that originally cost \$200 is on sale for \$140. By what percent was the price reduced?



Ans. 30%

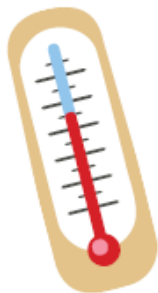
Q24. If $(x^2y^3)^2 = x^ay^b$, what is the value of a + b?

Ans. 10

Q25. What is the 40th positive odd integer?

Ans. 79

Q26. On Monday at 8 p.m., the temperature measured -17 degrees. Between 8 p.m. on Monday and 6 a.m. on Tuesday, the temperature increased 23 degrees. On Tuesday, between 6 a.m. and 3 p.m., the temperature decreased 5 degrees. What was the temperature on Tuesday at 3 p.m.?



Ans. 1 degree

Q27. What integer is closest to -7π ?

Ans. -22

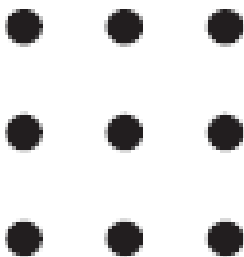
Q28. Triangle ABC has vertices A(0, 5), B(12, 0) and C(0, 0) in the coordinate plane. The image when triangle ABC is rotated clockwise about the origin is triangle A'B'C' with vertex A'(3, 4). What fraction of the area of triangle A'B'C' is below the x-axis? Express your answer as a common fraction.

Ans. $\frac{9}{14}$

Q29. When $9!$ is expressed as an integer in base 9, the result ends in m zeros, and the last nonzero digit immediately preceding the m zeros is n . What is the value of the ordered pair (m, n) ?

Ans. (2,7)

Q30. How many different lines pass through at least two of the nine points in the grid below?



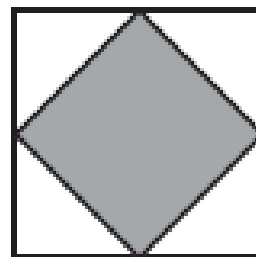
Ans. 20 lines

Q31. The figure shown is a square with sides of length 5 inches. The shaded stripes run parallel to the sides of the square, and they divide the bottom and left-hand sides of the square into segments of length 1 inch. What is the total area of the shaded stripes?



Ans. 10in^2

Q32. In the figure shown, the shaded inner square has area 36 cm^2 , and each of its vertices intersects the midpoint of a side of the outer square. What is the area of the outer square?



Ans. 72 cm^2

Q33. If each question mark in the equation shown is replaced with an exponent of either 1 or -1 , what is the least possible value of $|x - 1|$? Express your answer as a common fraction.

Ans. $\frac{3}{35}$

Q34. If a and b are real numbers with $a - b = 1$, what is the least possible value of $a^5 - b^5$? Express your answer as a common fraction.

Ans. $\frac{1}{16}$

Q35. In the figure, three congruent, non-overlapping shaded circles are inside a large circle. The greatest possible value of the ratio of the total area of the shaded regions to the area of the large circle can be expressed in the form $a + b\sqrt{c}$. What is the value of $a + b + c$?

Ans. 30

Q36. What is the smallest prime number p for which $2^p - 1$ is composite?

Ans.11

Q37. The line $y = kx$ is equidistant from the points with coordinates (1, 3) and (5, 4). What value of k minimizes the distance to either point? Express your answer as a common fraction.

Ans. $\frac{7}{6}$

Q38. What is the least positive integer with at least ten positive integer divisors?

Ans. 48

Q39. If a, b, c and d are values chosen randomly and without replacement from the set $\{1, 2, 3, 4, 5\}$, what is the probability that $ab - cd = 18$? Express your answer as a common fraction.

Ans. $\frac{1}{30}$

Q40. If n is a two-digit positive integer, what is the sum of the digits of $99n$?

Ans. 18

Q41. The circles given by the equations $x^2 + y^2 = 169$ and $x^2 + (y - 14)^2 = 225$ have a common chord. How many units long is that chord?

Ans. 24 units

Q42. If a, b and c are positive integers such that $a - bc = 19$ and $a + bc = 99$, what is the least possible value of $a + b + c$?

Ans. 72

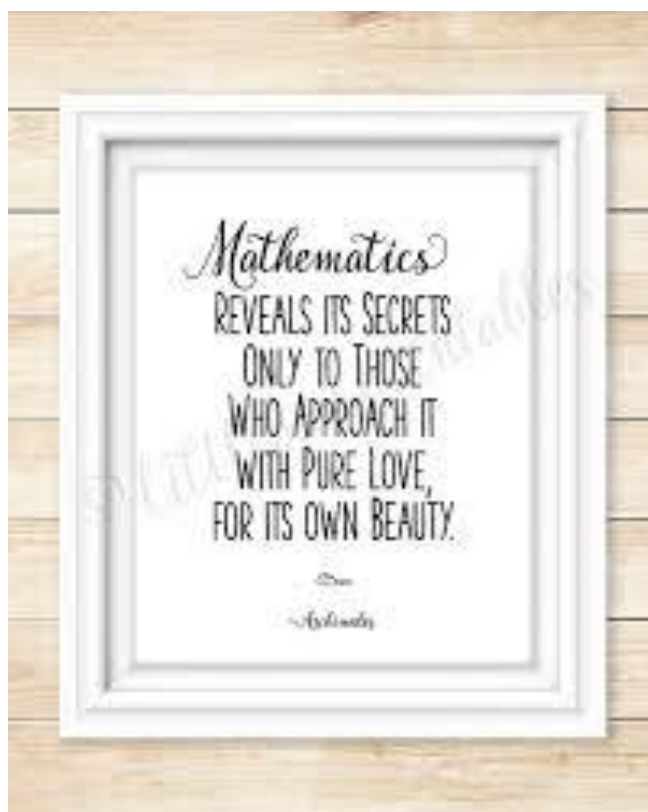
Q43. What is the sum of all the integers x for which $x^2 + 4x \leq 1$?

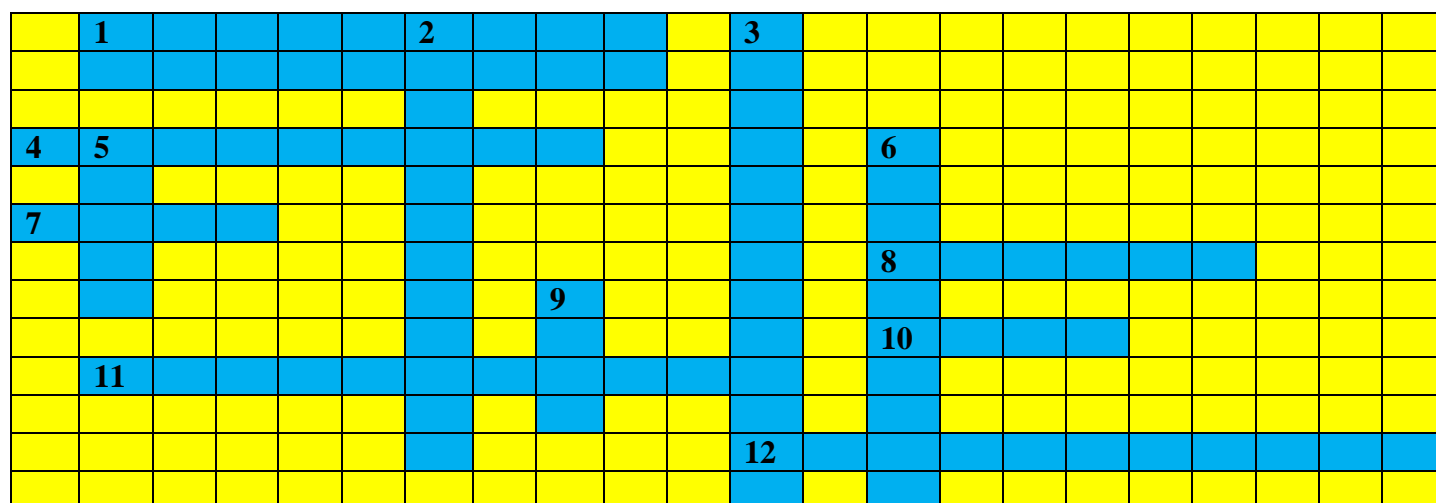
Ans. -10

The author, is **Editor of this Monthly e-Bulletin**. He is an eminent mentor, analyst and connoisseur of Mathematics from IIT for preparing aspirants of Competitive Examinations for Services & Admissions to different streams of study at Undergraduate and Graduate levels using formal methods of teaching shared with technological aids to keep learning at par with escalating standards of scholars and learners. He has authored numerous books of excellence.

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—00—



CROSSWORD PUZZLE June'2020 : India Fights COVID-19**Prof. SB Dhar****ACROSS**

- 1 App to assess usages of Ayush advisories
 4 Aarogya Setu IVRS Service is available on
 7 Month when NEET exam will be held
 8 Month when JEE (Advanced) exam will be held
 10 Agency that developed UN disinfecting tower
 12 App to track Covid-19 cases

DOWN

- 2 Mission to evacuate Indians from abroad
 3 Flight operating for essentials and medical cargo
 5 Abbreviation for Ayurvedic, Yoga, Unani, Siddha and Homeopathy
 6 PM Modi's new slogan for social distancing
 9 Thing that we must wear when we step out

—00—

Answer to this Crossword Puzzle shall be provided in next issue of this e-Bulletin

—00—

Problems are meant to be solved; every solution opens a doorway to new problems. This is an endless journey to discovery of nature.

We are, what we are, because of rigorous efforts of countless persons.

—00—

*Growing with Concepts: Physics***Typical Questions: Geometrical Optics (Set 3)**

These question banks have been developed for students who are - (a) in initial stages of solving problems from text book or reference book so as to gain proficiency in application of concepts learnt, and (b) deprived of adequate exposure at learning. Such unprivileged and deprived students need guidance for stepwise application of concepts and associated mathematics, while evolving solutions. Main purpose of is to inculcate in students an ability to appreciate physics and related mathematics involved in problems and apply them. Accordingly, illustrations have been made explanatory to the extent possible. Once, students get equipped with that capability, gradually they themselves would be able to evolve optimized solutions. Greater is the practice more intuitive becomes the optimization of steps. Those students who are at a stage of refining their problem solving skills or more apt at concepts may choose to use these illustrations. However, they may please bear in mind our target students and, therefore, they skip detailing in illustrations to the best of their advantage.

Science is a subject not to learn but a matter of realization through experiments and its visualization in surrounding. But, our target students are not equipped either to conduct experiment or an environment which facilitates visualization of science in play around him. This is where simulation is a technique to validate concepts and study effect of variation in parameters related to the concept. Education creates an opportunity of systematic learning concepts without reinventing the wheel.

Solving typical problems with gradual increase in complexity helps to build power of visualization of concepts, without losing confidence in one's ability. It requires reasonable proficiency in language to understand problem, in first go. Next comes evolving solution or answer based on concepts learnt. At this stage extremely simpler calculations are being skipped, with a hope that reader would be able to decipher intermediate steps.

Questions and problems appearing in competitive examinations are seldom encountered in real life, and are never straight application of formula. They demand integration interdisciplinary knowledge. Yet ability to solve such typical problems, enhances competence to handle unknown problems speedily, correctly and with a greater degree of clarity and confidence, an essential attribute of thought process needed for success in life.

Mentors' Manual is one of the dimensions of the Gyan Vigyan Sarita through which efforts are being made to reach out to remote teachers through our experience of mentoring unprivileged children who severely lack in exposure. Moreover, they are disconnected from us by virtue of multiple barriers. Despite, efforts to establish direct interaction through Interactive Online Mentoring Sessions (IOMS) its reach to target students is extremely feeble. Nevertheless, IOMS has established as a working model of selfless mentoring unprivileged children. This experience is being disseminated to the teachers spread out by writing of chapters of an open source Mentors' Manual.

India, growing digital, provides optimism to every student to be able to have an access to virtual laboratory; it is an alternative to physical laboratory. It provides an opportunity to carry out virtual experiments in an e-environment. In this environment excellent simulation videos available on the web either free or on price. But, problem mostly encountered by students is in sequencing and scaling of concepts and selection of an appropriate video out of a big list available in web-search. This is severely distracting. Mentors are, however, the best persons to use these videos to modulate and upgrade their illustrations. Yet it does not rule out importance of hands-on by students in problem solving and is called dry-run of concepts, in the parlance of computer programming.

In light of this Question Banks including problems from various sources and they are being supported with illustrations is being created. These illustrations are not just solutions but an attempt to bring home use of basics involved in solving problems. In this effort repository of problems from good books viz. Prof. H.C. Verma and a team of authors Robert Resnick, David Halliday and Kenneth S. Krane and many more have been used. These questions are graded and authors have attempted to incorporate all concepts covered in the book. Thus it necessitates a student to read each chapter carefully before taking up questions.

In this stream of efforts Question Bank, Part-3, Set-2 with illustrations on Geometrical Optics has been uploaded on the web. Out of this few selected question are brought out here.

This initiative of a small group of passionate persons is aimed at to mentor unprivileged children and is driven with a sense of **Personal Social Responsibility (PSR)** in a *non-organizational, non-remunerative, non-commercial and non-political manner*. You are welcome to add value to this initiative by way of suggestion, advising correction or new type of questions, or any other form that suits to your passion and convenience.

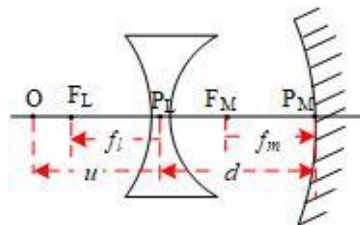
Wave and Motion : Geometrical Optics – Selected Questions –Set 3

Question 1: A diverging lens of focal length 20 cm and a converging mirror of focal length 10 cm are placed coaxially at a separation of 5.0 cm. Where should an object be placed so that a real image is formed at the object itself?

Illustration:

This problem is solved in two methods –

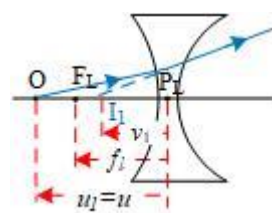
- Conventional Geometrical Optics. In this two processes refraction through mirror, both them placed at a distance. transformation of variables is involved. Moreover, use of Cartesian requires differentiating between absolute values and signed values
- Using property of reversible traceability in geometrical optics. It understanding of concepts of physics



through lens and
Accordingly,
Sign convention
of the variables.
involves better

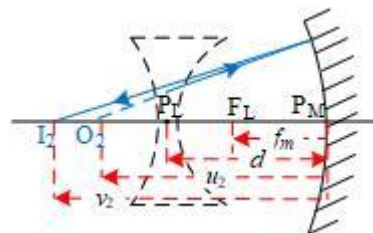
Method (a): The combination of lens and mirror creates optical phenomenon in three stages- **Stage 1:** Image formed by diverging lens, **Stage 2:** image of stage-1 acts as an object for reflection image by concave mirror, **Stage 3:** image of stage-2 act as an object to form refraction image by the lens. The problem is being solved stage wise, using Cartesian Sign convention, as under

Stage1: Using lens formula with the available data $\frac{1}{v_1} - \frac{1}{u_1} = \frac{1}{f_L} \dots (1)$. In respect of lens all w.r.t. the pole P_L . It leads to $\frac{1}{v_1} = \frac{1}{-f_L} + \frac{1}{-u_1}$, here (-)sign is indicative of its direction..
Thus, $\frac{1}{v_1} = \frac{1}{-20} + \frac{1}{-u_1}$, or we have $v_1 = -\frac{20u_1}{20+u_1} \dots (2)$, here (-)sign is indicative of its direction,
while absolute value of distance of image w.r.t. P_L is $|v_1| = \frac{20u_1}{20+u_1}$.



of diverging
its direction..
of its direction,

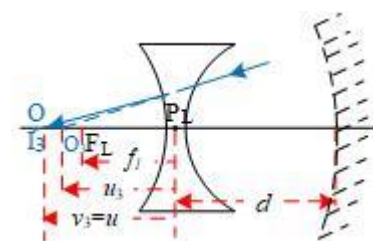
Stage 2: Image in stage 1 becomes object for stage 2, and all distances shall be considered w.r.t. pole of mirror P_M . Further, in this mirror formula shall be used as $\frac{1}{-v_2} + \frac{1}{-u_2} = \frac{1}{-f_M} \Rightarrow \frac{1}{v_2} = \frac{1}{f_M} - \frac{1}{u_2}$. Transforming all distances w.r.t. P_M . In this also all the on left of the pole P_M and hence (-)ve. Thus, it leads to $u_2 = 5 + \frac{20u_1}{20+u_1} = \frac{100+25u_1}{20+u_1}$. Thus, $\frac{1}{v_2} = \frac{1}{10} - \left(\frac{20+u_1}{100+25u_1} \right) = \frac{100+25u_1-200-10u_1}{10 \times (100+25u_1)} = \frac{15u_1-100}{10 \times (100+25u_1)} \Rightarrow \frac{1}{v_2} = \frac{3u_1-20}{50u_1+200}$. It leads to $v_2 = \frac{50u_1+200}{3u_1-20}$ is the absolute value of distance of image from P_M .
distances are $d + |v_1| \Rightarrow$
to $v_2 =$



Stage 3: Again there is refraction through diverging lens, therefore distances are transformed w.r.t. where reference to P_L . Assuming that image by mirror I_2 is located at the left of the lens, as shown in the figure of stage-2, hence, physical distance $u_3 = (v_2 - d) = \frac{50u_1+200}{3u_1-20} - 5$. Thus, we have $u_3 = \frac{(100+65u_1)-5(3u_1-20)}{3u_1-20} = \frac{(100+65u_1)-(15u_1-100)}{3u_1-20}$. It

leads to $u_3 = \frac{35u_1+300}{3u_1-20}$. Again using (1) $\frac{1}{v_3} - \frac{1}{u_3} = \frac{1}{f_L}$ with the available we
have $\frac{1}{v_3} - \frac{1}{\frac{35u_1+300}{3u_1-20}} = \frac{1}{-20} \Rightarrow \frac{1}{v_3} = \frac{3u_1-20}{35u_1+300} - \frac{1}{20}$. It is required

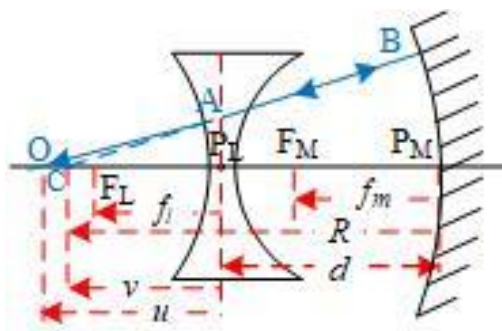
position of object such that final image falls on itself i.e. $v_3 = u_1 = u$.
Thus, $\frac{1}{-u} = \frac{-3u-20}{-35u+300} - \frac{1}{20}$. It leads to $\frac{1}{u} = \frac{60u+400}{(60u+400)+(-35u+300)} \Rightarrow \frac{1}{u} = \frac{25u+700}{20 \times (-35u+300)} \Rightarrow \frac{1}{u} = \frac{5u+140}{4 \times (-35u+300)} \Rightarrow \frac{1}{u} = \frac{5u+140}{-140u+1200}$. It reduces to $5u^2 + 140u = -140u + 1200$. Thus it leads to $u^2 + 56u - 240 =$



available we
to determine
 $u_1 = u$

0. It is a quadratic equation where we have $u = \frac{56 \pm \sqrt{56^2 - 4 \times 1 \times (-240)}}{2}$, or $u = \frac{56 \pm \sqrt{4196}}{2} = \frac{56 \pm 64.8}{2} = 60.4$ cm or as per SDs **60 cm, is the absolute value, is the answer**

Method (b): As per principle of reversible traceability Ray after refraction if goes along AB then, a ray along BA would go along AO. Moreover, it is required to obtain object such that final image overlaps on the object. This is possible only for radial ray in spherical mirror. Accordingly, using principle of reversible traceability after refraction shall be at C, the centre of curvature. Thus problem is reduced to single refraction such that $2 \times f_m - d = 2 \times 10 - 5 = 15 \text{ cm}$. Using lens have $\frac{1}{v} - \frac{1}{u} = \frac{1}{f} \Rightarrow \frac{1}{-15} - \frac{1}{u} = \frac{1}{-20} \Rightarrow \frac{1}{u} = \frac{1}{-15} - \frac{1}{-20} = \frac{1}{u} = -\frac{1}{60}$, or $u = 60 \text{ cm}$ is the answer.



from object after refraction position of This is possible self along BA.

image of object of the mirror. $v = R - d =$ formula we $-\left(\frac{1}{15} - \frac{1}{20}\right) \Rightarrow$

N.B.: (1) Solution of the problem is beautifully simplified by rightly appreciating the concept of physics going into it..

(2) Further, stage-wise solution of problem in conventional manner, though a bit long involves transformation of variables at every stage as reference point toggles $P_L \leftrightarrow P_M$ and associated Cartesian Sign Convention.

(3) The conventional method is prone to error and hence wherever possible principle of reversible traceability should be used to make crisp and smart solution.

Question 2: A converging lens of focal length 15 cm and a converging mirror of focal length 10 cm are placed 50 cm apart with common principal axis. Where should a point source be placed on the principal axis so that the two images form at the same place?

Illustration:

The system is shown in the figure where a converging (convex) lens of focal length $f_L = 15$ and a converging (concave) mirror of focal length $f = 10$ cm are placed at a distance $d = 50$ cm with common principal axis. It is required to find position of object S such that image formed by lens and mirror are at same place. Position of image formed by lens is determined using formula $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$... (1) But, image formed by mirror is in two stages:

Stage 1- By reflection from concave mirror and **Stage 2-** image formed by lens of image in stage 1. Thus, if image formed by mirror is at any point other than S, leading to different value u' , the two images cannot be coincident.

Thus, primary requirement for two images to be at same place is S and S' coincide. This as per mirror formula $\frac{1}{v} + \frac{1}{u'} = \frac{1}{f} \Rightarrow \frac{1}{R} + \frac{1}{u'} = \frac{1}{f} \Rightarrow \frac{1}{2f} + \frac{1}{u'} = \frac{1}{f} \Rightarrow \frac{1}{u'} = \frac{1}{f} - \frac{1}{2f} \Rightarrow \frac{1}{u'} = \frac{1}{2f} \Rightarrow \frac{1}{u'} = \frac{1}{R}$, here $u' = R = 2f$ for a mirror. It implies that S and C are coincide. Accordingly, $u = d - u' \Rightarrow u = d - 2f$. Thus it leads to $u = 50 - 2 \times 10 \Rightarrow u = 30 \text{ cm}$ from lens towards the mirror is the answer.

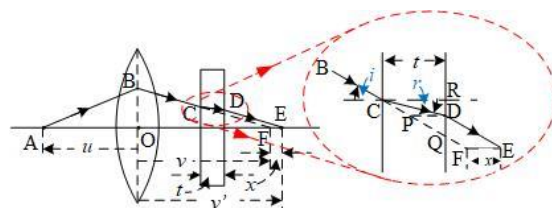
N.B.: In this problem numerical part is very little, all that drives to correct answer is inferences from logic of reflection and refraction and corresponding formula.

Question 3: A point object is placed on the principal axis of a convex lens ($f = 15$ cm) at a distance of 30 cm apart. A glass plate ($\mu = 1.50$) of thickness 1 cm is placed on the other side of the lens perpendicular to the axis. Locate the image of the point object.

Illustration:

This problem involves solution in two stages and are illustrated below.

Stage 1: It is determination of position of image using lens formula $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$... (1) Here, as per sign convention $u = -30$ cm and $f = 15$ cm; in this case focal point on the right of optical centre O



will come into play and $f = 15$ is positive. Accordingly, $\frac{1}{v} = \frac{1}{f} + \frac{1}{u} \Rightarrow \frac{1}{v} = \frac{1}{15} + \frac{1}{-30} = \frac{1}{30} \Rightarrow v = 30$ cm.

Stage 2: A glass plate of thickness $t = 1$ cm would affect optical path, as shown in the inset in the figure, to cause a shift by FE a distance $+x$ in the image; this is being formulated. Geometrically, shift $x = FE = PD$. In $\triangle PDE$, the angle $\angle DPQ = i$, and $\tan i = \frac{DQ}{PD} = \frac{RQ-RD}{x}$, it leads to $x = \frac{RQ-RD}{\tan i} \dots (2)$. In $\triangle CRQ$ we have $\tan i = \frac{RQ}{CR} \Rightarrow RQ = t \cdot \tan i \dots (3)$, in $\triangle CRD$ $\tan r = \frac{RD}{CR} \Rightarrow RD = t \cdot \tan r \dots (4)$. Combining, (2), (3) and (4) we have $x = \frac{t \cdot \tan i - t \cdot \tan r}{\tan i} \Rightarrow x = \left(1 - \frac{\tan r}{\tan i}\right) t \dots (6)$

The lens formula is approximation of $i \ll$ and consequent $r \ll$ and this leads to $\sin i \approx \tan i$ and likewise, $\sin r \approx \tan r$. Thus, (6) is transformed to $\frac{\tan r}{\tan i} \approx \frac{\sin r}{\sin i} = \frac{1}{\mu}$, here refractive index of glass plate is given to be

$$\mu = 1.5 = \frac{3}{2}. \text{ Therefore, using (6) with the available data } x = \left(1 - \frac{2}{3}\right) \times 1 = 0.33 \text{ cm}$$

Combining results of stage 1 & 2, we have position of final image $v' = v + x \Rightarrow v' = 30 + 0.33 \Rightarrow x = 30.33$ cm, is the answer from the lens towards the glass plate.

Question 4: Two convex lenses, each of focal length 10 cm, are placed at a separation of 15 cm with their principal axes coinciding.

- Show that a light beam coming parallel to the principal axis diverges as it comes out of the lens system.
- Find location of the virtual image formed by the lens system of an object placed far away.
- Find the focal length of the equivalent lens.

(Note: Sign of focal length is positive although the lens system actually diverges a parallel beam incident on it)

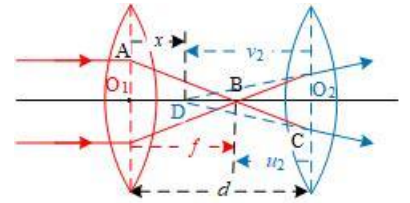
Illustration:

Given that a pair of two identical convex (converging) lenses have focal length $f = +10$ cm are separated by $d = 15$ cm. A light beam parallel to the principal axis from left, as shown in figure would converge at B the focal point of the lens with optical center O_1 . Since, optical center of another lens is at O_2 , the distance of B, is $BO_2 = d - f = 15 - 10 = 5$ cm. In accordance with sign convention $u_2 = -5$ cm. Applying lens formula $\frac{1}{v_2} - \frac{1}{u_2} = \frac{1}{f} \Rightarrow \frac{1}{v_2} = \frac{1}{f} + \frac{1}{u_2} \Rightarrow \frac{1}{v_2} = \frac{1}{10} + \frac{1}{-5} \Rightarrow \frac{1}{v_2} = \frac{1}{10} - \frac{1}{5} \Rightarrow \frac{1}{v_2} = -\frac{1}{10} \Rightarrow v_2 = -10$ cm at D, with divergent rays emerging out of the lens system. **Thus part (a) is proved.**

Position of final image at D above is virtual with $v_2 = -10$ cm. Thus its location is $x = d + v_2$, which using available data is $x = 15 + (-10) = 5$ cm from the first lens towards the second lens, is the answer of part (b).

Focal length of the combination of a pair of lenses f_c is expressed as $\frac{1}{f_c} = \frac{1}{f_1} + \frac{1}{f_2} - \frac{d}{f_1 f_2}$, as derived in Appendix. In the instant case $f_1 = f_2 = f = 10$. Thus using the available data $\frac{1}{f_c} = \frac{1}{10} + \frac{1}{10} - \frac{15}{10 \times 10} \Rightarrow \frac{1}{f_c} = \frac{5}{100} \Rightarrow f_c = 20$ cm, is the answer of part (b).

Thus answers are (a) Proved (b) 5 cm from the first lens towards the second lens (c) 20 cm.



Question 5: A ball is kept at a height h above the surface of a transparent sphere made of a material of refractive index μ . The radius of sphere is R . At $t = 0$, the ball is dropped to fall normally on the sphere. Find the speed of the

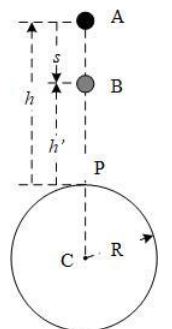
image formed as a function of time for $t < \sqrt{\frac{2h}{g}}$. Consider only image by a single refraction.

Illustration:

Let initially when the ball is dropped $u = 0$, from a height h above a transparent sphere of transparent material having refractive index μ . Here, the experiment is conducted on earth wherein fall of body is governed by equations of motion where acceleration is $a = -g$ and is radial along CA, which is perpendicular to the earth's surface, i.e. direction of motion under gravity.

Therefore, in time t the ball, as per second equation of motion, will fall through a height $s = ut + \frac{1}{2}(-g)t^2 \Rightarrow s = -\frac{gt^2}{2}$. Thus effective distance of the ball from the sphere, taken vectorially, is $h' = h + s \Rightarrow h' = h - \frac{gt^2}{2}$. ..(1). It is required form speed of ball as a function of time t such that $t < \sqrt{\frac{2h}{g}}$. This

implies from (1) that until ball reached the surface of the sphere.



As regards formation of image, it is an optical phenomenon, and determination of speed of image, as required, involves concepts of mechanics–cum-optics.

Formation of image, in this case, is refraction through spherical surface where $\frac{\mu_2}{v} - \frac{\mu_1}{u} = \frac{\mu_2 - \mu_1}{R}$... (2). In this case given that relative refractive index of material of sphere, in the medium surrounding the sphere, is $\mu = \frac{\mu_2}{\mu_1}$... (3). Further, $u = h'$... (4) distance of the ball from pole P of the spherical surface as (+)ve, as per Cartesian Sign convention, the reference point for optics, and correspondingly v is the distance of image of the sphere at an instant t from P and R has (-)ve numerical value. Accordingly, combining (2) and (3) we have $\frac{\mu_2}{\mu_1} \times \frac{1}{v} - \frac{1}{u} = \frac{\mu_2 - \mu_1}{R} \Rightarrow \frac{\mu}{v} = \left(\frac{1}{u} + \frac{\mu - 1}{R}\right)$... (5). Equation (5) can be transformed into a form $v = \frac{\mu^2 R u}{\mu R + u(\mu - 1)}$... (6).

Therefore, to determine speed of image differentiate (5) w.r.t. t we get $\frac{d}{dt}\left(\frac{\mu}{v}\right) = \frac{d}{dt}\left(\frac{1}{u} + \frac{\mu - 1}{R}\right)$. Here, both u and v are functions of t , while $\frac{\mu - 1}{\mu R}$ is a constant of the system. Thus $\mu \frac{d}{dv}\left(\frac{1}{v}\right)\left(\frac{dv}{dt}\right) = \frac{d}{du}\left(\frac{1}{u}\right)\left(\frac{du}{dt}\right)$. This solves into $-\frac{\mu}{v^2}\left(\frac{dv}{dt}\right) = -\frac{1}{u^2}\left(\frac{du}{dt}\right)$... (7). Here, speed of image is $V = \frac{d}{dt}v$ and thus $V = \frac{1}{\mu}\left(\frac{v}{u}\right)^2 \times \frac{du}{dt}$... (8)

Combining (1) and (4), $\frac{du}{dt} = \frac{d}{dt}h' = \frac{d}{dt}\left(h - \frac{gt^2}{2}\right) \Rightarrow \frac{du}{dt} = -\frac{g}{2} \frac{dt^2}{dt} = -\frac{g}{2} \times 2t \Rightarrow \frac{du}{dt} = -gt$... (9), the (-) Sign indicates the ball moving toward the center of the sphere.

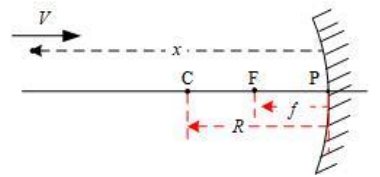
Combining (9) and (6) in (8) we have, $V = \frac{1}{\mu} \left(\frac{\mu R u}{\mu R + u(\mu - 1)}\right)^2 \times (-gt) \Rightarrow V = -\frac{gt}{\mu} \times \frac{\mu^2 R^2}{(\mu R + u(\mu - 1))^2}$. It simplifies into $V = -\frac{\mu R^2 g t}{(\mu R + u(\mu - 1))^2}$. Here, (-) sign indicates that direction of image is towards the center of the sphere.

N.B.: Here elaboration of concept of differential calculus is considered essential for those students who have not been sufficiently exposed to it, and keeping in consideration especially the students of bio-science. We regret our inability to illustrate in greater details, as it would shift focus of the illustration from physics to mathematics.

Question:6: A particle is moving at a constant speed V from a large distance towards a concave mirror of radius R along its principal axis. Find the speed of the image formed by the mirror as a function of distance x of the particle from the mirror.

Illustration:

Given system is depicted in the figure. Distance of object from concave mirror x is large; C is the center of curvature of the mirror having radius R and F is the focal point of the mirror such that $R = 2f$. As per Cartesian Sign convention both x and R are (-)ve w.r.t. pole P, and hence f is also (-).



Position of image as per formula of spherical mirrors is $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$. As per Cartesian Sign

convention w.r.t. pole P, $u = -x$ and $f = -\frac{R}{2}$. Hence, $\frac{1}{v} = \frac{1}{f} - \frac{1}{u}$. Using the available data $\frac{1}{v} = \frac{1}{-\frac{R}{2}} - \frac{1}{-x} \Rightarrow \frac{1}{v} = \frac{1}{x} - \frac{2}{R}$... (1).

Distance of image can be also written as $v = \left(\frac{Rx}{R - 2x}\right)$... (2). Here, it is given that the object is moving along the principal axis with a constant speed $V = \frac{dx}{dt}$.

Therefore, speed of the image is $\frac{d}{dt}v$ is obtained by differentiating both sides of (1) w.r.t. t . Accordingly,

$\frac{d}{dt}\left(\frac{1}{v}\right) = \frac{d}{dt}\left(\frac{1}{x} - \frac{2}{R}\right) \Rightarrow \frac{d}{dv}\left(\frac{1}{v}\right) \times \frac{dv}{dt} = \frac{d}{dx}\left(\frac{1}{x}\right) \times \frac{dx}{dt} \Rightarrow \left(-\frac{1}{v^2}\right) \times \frac{dv}{dt} = \left(-\frac{1}{x^2}\right) \times V \Rightarrow \frac{dv}{dt} = v^2 \frac{V}{x^2}$... (3). Thus with (2), $\frac{dv}{dt} = v^2 \frac{V}{x^2} \Rightarrow \frac{dv}{dt} = \left(\frac{Rx}{R - 2x}\right)^2 \frac{V}{x^2} \Rightarrow \frac{dv}{dt} = \frac{R^2 V}{(R - 2x)^2}$ or $\frac{R^2 V}{(2x - R)^2}$ is the answer.

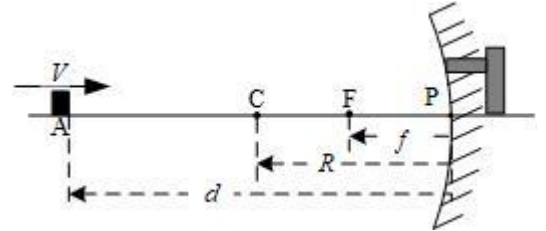
N.B.: Here elaboration of concept of differential calculus is considered essential for those students who have not been sufficiently exposed to it, and keeping in consideration especially the students of bio-science. We regret our inability to illustrate in greater details, as it would shift focus of the illustration from physics to mathematics.

Question 7: A small block of mass m and a concave mirror of radius R fitted with a stand lies on a smooth horizontal table with a separation d between them. The mirror together with its stand has a mass m . The block is pushed at $t = 0$ towards the mirror so that it starts moving towards the mirror at a constant speed V and collides with it. The collision is perfectly elastic. Find velocity of the image-

- (a) at a time $t < \frac{d}{V}$
 (b) at a time $t > \frac{d}{V}$

Illustration:

The given system is depicted in figure the block of mass m at A, at a distance $-d$, from the mirror of radius R w.r.t. its pole P is moving towards the mirror with a velocity V . The block makes elastic collision with the mirror with its stand of mass m , at rest on the table. Eventually, on applying principle of conservation of momentum and conservation of energy to system of the block and the mirror, after collision the block will come to rest while, mirror will be set into motion with velocity V , while the block will come to rest on the table.



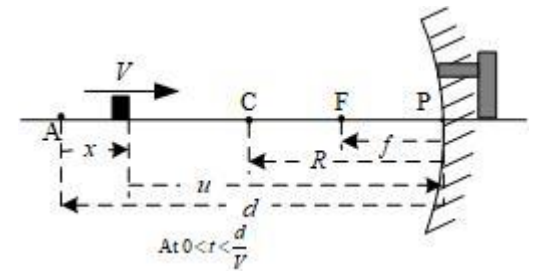
Time at which block will reach mirror and collide with it is $t = \frac{d}{V}$. It is required to find velocity of the image: (a) pre-collision i.e. at a time $t < \frac{d}{V}$ and (b) post collision i.e. at a time $t > \frac{d}{V}$.

As per mirror formula $\frac{1}{f} = \frac{1}{u} + \frac{1}{v} \Rightarrow \frac{1}{v} = \frac{1}{f} - \frac{1}{u}$, here focal length f is constant and distance of object from pole of mirror.

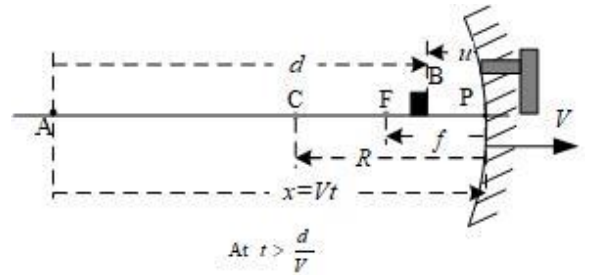
Thus, distance of image from mirror v is $\frac{1}{v} = \frac{1}{f} - \frac{1}{u} \Rightarrow \frac{1}{v} = \frac{u-f}{uf} \Rightarrow v = \frac{uf}{u-f} \dots (1)$. Therefore, $\frac{d}{dt} \left(\frac{1}{v} \right) = \frac{d}{dt} \left(\frac{1}{f} - \frac{1}{u} \right) \Rightarrow \frac{d}{dt} \left(\frac{1}{v} \right) \times \frac{dv}{dt} = -\frac{d}{du} \left(\frac{1}{u} \right) \times \frac{du}{dt}$. It leads to $\left(-\frac{1}{v^2} \right) \times \frac{dv}{dt} = -\left(-\frac{1}{u^2} \right) \times \frac{du}{dt}$. Thus, we have $\frac{dv}{dt} = -\left(\frac{v}{u} \right)^2 \frac{du}{dt} \Rightarrow \frac{dv}{dt} = -\left(\frac{uf}{u-f} \times \frac{1}{u} \right)^2 \frac{du}{dt}$. It solves into $\frac{dv}{dt} = -\left(\frac{f}{u-f} \right)^2 \frac{du}{dt} \dots (2)$

Reference point for distances in case of mirrors is its pole. But, in the instant case pole is static during $0 < t < \frac{d}{V}$ i.e. pre-collision and during post collision it is in motion with constant velocity for $t > \frac{d}{V}$.

Case (a): $0 < t < \frac{d}{V}$: In this case since P is static and hence as per normal convention it is taken as reference point, and accordingly $u = -d + x \dots (3)$ and $\frac{du}{dt} = \frac{d(Vt)}{dt} = V \dots (4)$ while $f = -\frac{R}{2} \dots (5)$. Using (3), (4) and (5) in (2) velocity of image w.r.t. P is $\frac{dv}{dt} = -\left(\frac{-\frac{R}{2}}{(x-d)-(-\frac{R}{2})} \right)^2 V$. It simplifies into $\frac{dv}{dt} = -\left(\frac{R}{2(d-Vt)-R} \right)^2 V$ is the answer of part (a).



Case (b): $t > \frac{d}{V}$: In this case since P is moving with mirror and hence A, starting point of the block, is taken as reference point. Accordingly, velocity of the image is arrived at by taking $u = (x - d) \Rightarrow Vt - d \dots (6)$, while focus w.r.t. P is at $f = -\frac{R}{2}$ as per (5) Accordingly, using (2), (5) and (6) $\frac{dv}{dt} = -\left(\frac{f}{u-f} \right)^2 V \Rightarrow \frac{dv}{dt} = -\left(\frac{-\frac{R}{2}}{(Vt-d)-(-\frac{R}{2})} \right)^2 V$. It resolves into the velocity of image w.r.t. A as $\frac{dv}{dt} = -\frac{R^2}{[2(d-Vt)-R]^2} V$



Therefore, absolute velocity of image is $V_{img} = V + \frac{dv}{dt} \Rightarrow V_{img} = V - \frac{R^2}{[2(d-Vt)-R]^2} V \Rightarrow V_{img} = V \left[1 - \frac{R^2}{[2(d-Vt)-R]^2} \right]$ is the answer of part (a).

- N.B.:** (a) This problem involves principles of optics together with principle of collision and relative motion as well.
 (b) Velocity of image is absolute and accordingly in Part (b) P is in motion with the mirror and hence point A which is static in both the cases is taken as reference. Since in part (a) both point A and P are static and hence P is taken as reference as per convention.

Question 9: A gun of mass M fires a bullet of mass m with a horizontal speed V . The gun is fitted with a concave mirror of focal length f facing towards the receding bullet. Find the speed of separation of the bullet and the image just after the gun was fired.

Illustration:

Let bullet be of mass m receding with velocity V , and the gun is of mass M . After the bullet is fired the gun acquires velocity V_g . The gun-bullet system is at rest at $t = 0^-$ i.e. pre-firing and post firing at $t \geq 0^+$, as per conservation of momentum velocities of the system shall be $M \times 0 + m \times 0 = mV + MV_g \Rightarrow V_g = -\frac{m}{M}V$ i.e. in a direction opposite to the bullet. Therefore, velocity of the bullet w.r.t. to gun vis-à-vis mirror fitted on the gun as shown in the mirror is $V_r = V - V_g$, it



implies that $V_r = V \left(1 - \left(-\frac{m}{M} \right) \right) = \left(1 + \frac{m}{M} \right) V \Rightarrow V_r = \frac{M+m}{M} V t$; Therefore, separation of bullet at any time $t > 0$ from the mirror is $u = V_r \times t \Rightarrow u = \frac{M+m}{M} V t$. ..(1)

As per mirror formula, $\frac{1}{f} = \frac{1}{u} + \frac{1}{v} \Rightarrow \frac{1}{v} = \frac{1}{f} - \frac{1}{u}$... (2). Hence, $v = \frac{uf}{u-f}$... (3) Here, u is distance of image from the mirror, f is focal length of the concave (converging) mirror and v is distance of image of bullet from the mirror. Here, both u and f are (+)ve as per Cartesian Sign Convention are (+)ve. Here, v will take appropriate sign determined by (3). Thus, separation of bullet and its image will be $x = u - v$... (4).

It is required in the question to determine velocity of separation of bullet and its image, just after bullet is fired i.e. $t \rightarrow 0^+$. Therefore, distance of bullet from the mirror from (1) would be $u = \left(\frac{M+m}{M} V \times t \right) \Rightarrow u \rightarrow 0^+$. For this infinitesimally small value of u , from (3), we have $v = -uf \times (f-u)^{-1}|_{u \rightarrow 0^+}$... (5). This is a problem of limit involving expansion $(f-u)^{-1}|_{u \rightarrow 0^+} = [f^{-1} + (-1)f^{-2}u^{-1} \dots]u \rightarrow 0^+$. This is an infinite converging series where excluding first terms all other terms are negligible. Accordingly, it solves into $(f-u)^{-1}|_{u \rightarrow 0^+} = f^{-1}$... (6). Combining, (5) and (6), $v = -uf \times f^{-1} \Rightarrow v = -u$... (7).

Combining (4) and (7) $x = u - (-u) = 2u$. Therefore, velocity of separation is of bullet w.r.t. its image is $V_s = \frac{dx}{dt} = \frac{d}{dt} 2u \Rightarrow V_s = 2 \frac{d}{dt} \left(\frac{M+m}{M} V t \right) \Rightarrow V_s = 2 \left(\frac{M+m}{M} V \right) \frac{d}{dt} t \Rightarrow V_s = 2 \left(\frac{M+m}{M} V \right)$, is the answer.

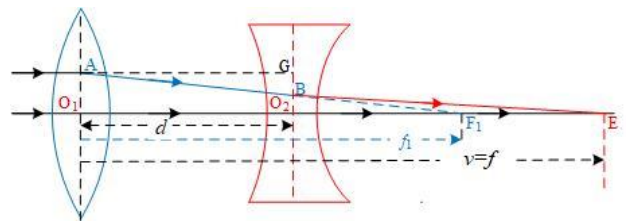
N.B.: It is essential to carefully note last part of the question "...just after the gun was fired". This statement turns this problem of opto-mechanics (Optics and Mechanics) into a problem involving application of concepts of Limits in mathematics. If the nuance is missed problem becomes more complicated and in turn leads to a longer solution. Placing limits as $t \rightarrow 0^+$ will eventually reduce the result the one obtained above. But, appreciating application of limit in initial stage itself on equation (3) will avoid all complications and thus possibilities of error.

This solution very simple and crisp, yet it appears to be lengthy because of illustration of associated concepts for a clear understanding.

APPENDIX

Focal Length of Combination of Two Lenses

Given is a divergent (concave) lens of focal length f_1 and a converging (convex) lens of focal length f_2 are placed apart at a distance d . It is required to find location of object for image formed by the combination of lenses is at ∞ . This problem, based on reversible traceability of light rays during refraction, can be treated as incident rays are parallel, position of image is effective focal point of the combination of lenses.



This problem is solved in two stages the using lens formula $\frac{1}{v} - \frac{1}{u} = \frac{1}{f} \dots (1)$; **Stage 1:** image formed by convex lens facing the object, and **Stage 2:** image in stage 1 acts as an intermediate object for concave lens, to form the final image.

Stage 1: As per (1), we have $\frac{1}{v_1} - \frac{1}{u} = \frac{1}{f_1} \Rightarrow \frac{1}{v_1} = \frac{1}{\infty} + \frac{1}{f_1} \Rightarrow \frac{1}{v_1} = \frac{1}{f_1} \Rightarrow v_1 = f_1 \dots (2)$ In this all distances are as per Cartesian Sign Convention are w.r.t. optical center O_1 , the lens under consideration.

Stage 2: In stage image formed in stage 1 acts as object. But, in this stage reference point for distances as per sign convention is O_2 , the optical center of the lens under consideration. Accordingly, using (2) we have $u_2 = v_1 - d \Rightarrow u_2 = f_1 - d \dots (3)$. Applying (1), $\frac{1}{v_2} - \frac{1}{u_2} = \frac{1}{f_2} \Rightarrow \frac{1}{v_2} = \frac{1}{u_2} + \frac{1}{f_2} \Rightarrow \frac{1}{v_2} = \frac{1}{f_1 - d} + \frac{1}{f_2} \dots (3)$. Since this is final image at E is formed by lens-combination and hence maintaining reference point as O_1 , distance of final image is $v = f$. Here, f is the effective focal length of the lens-combination. Thus, $v_2 = v - d = f - d \dots (4)$.

Combining (3) and (4) we have $\frac{1}{f-d} = \frac{1}{f_1-d} + \frac{1}{f_2} \Rightarrow \frac{1}{f-d} = \frac{f_2 + (f_1-d)}{(f_1-d)f_2} \Rightarrow f-d = \frac{f_1 f_2 - f_2 d}{f_2 + f_1 - d}$. This algebraic expression is further resolved into $f = d + \frac{f_1 f_2 - f_2 d}{f_2 + f_1 - d} \Rightarrow f = \frac{f_2 d + f_1 d - d^2 + f_1 f_2 - f_2 d}{f_2 + f_1 - d}$. This leads to $f = \frac{f_1 f_2 + f_1 d - d^2}{f_2 + f_1 - d} \dots (5)$.

Taking its reciprocal, to bring the equivalent focal length in format of (1) we have $\frac{1}{f} = \frac{f_2 + f_1 - d}{f_1 f_2 + f_1 d - d^2} \dots (6)$. In case the $d \ll f_1$, $d \ll f_2$ then $f_2 d \ll f_1 f_2$ and $d^2 \ll f_1 f_2$, and thus $(f_1 f_2 + f_1 d - d^2) \rightarrow f_1 f_2$. Accordingly, (6) leads to $\frac{1}{f} \approx \frac{f_2 + f_1 - d}{f_1 f_2} \Rightarrow \frac{1}{f} \approx \frac{1}{f_1} + \frac{1}{f_2} - \frac{d}{f_1 f_2} \dots (7)$. The formula (7) is generally used.

In a problem where d is comparable to both f_1 and f_2 the approximation is not valid hence we shall use (5).

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Growing with Concepts: Chemistry

Group 15 Elements: Nitrogen Family

Kumud Bala

Elements of Nitrogen Family are nitrogen (N) phosphorous (P) arsenic (As) antimony (Sb) and bismuth (Bi).

Occurrence:

Nitrogen: It occurs as a diatomic gas. It is 78% by volume in the atmosphere. It is thirty third most abundant element by weight in the earth's crust as nitrates i.e. sodium nitrate and potassium nitrate. It is an essential constituent of proteins, amino acid and nucleic acid (which regulate the growth and control of the hereditary effect in living beings). It is an essential constituent of fertilizers and explosives

Phosphorous: It is eleventh element by weight in the earth's crust and exists as phosphates. e.g.

- (i) Phosphorite $\text{Ca}_3(\text{PO}_4)_2$
- (ii) Fluorapatite $3\text{Ca}_3(\text{PO}_4)_2 \cdot \text{CaF}_2$
- (iii) Hydroxyapatite $3\text{Ca}_3(\text{PO}_4)_2 \cdot \text{Ca}(\text{OH})_2$

It is very reactive element, does not occur free in nature. It is an important constituent of plants and animals. Mainly present in bone and teeth in the form of phosphate (about 58% $\text{Ca}_3(\text{PO}_4)_2$ present in bones).

Arsenic, Antimony and Bismuth: These are not very abundant. These occur as sulphides in traces in other ores.

Atomic and Physical Properties:

1. Atomic Radii: Atomic radii of nitrogen family are smaller than carbon family (group 14).

It happens due to increased nuclear charge. The valence electrons are more pulled towards the nucleus due to greater attractive influence of the nucleus. Therefore decrease in atomic radii.

Atomic radii	C	N
(in pm)	77	70

2. Ionization enthalpy: Ionization enthalpy of the elements of group 15 is much higher than group 14.

I.E.	C	N
(KJ/mole)	1086	1402

Explanation: It is due to greater nuclear charge, reduced atomic size and stable half filled configuration. They have much less tendency to lose electrons as they are more tightly held by the nucleus. Going down the group, ionization enthalpy decreases. This is due to increase in atomic size which reduces the force of attraction on the electron by the nucleus.

I.E.	N	P	As	Sb	Bi
------	---	---	----	----	----

(KJ/mole)	1402	1012	947	834	703
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3. Oxidation States: Valence shell electronic configuration is ns^2np^3 . Elements of group 15 can complete their octet in two ways by accepting three electrons or by sharing three electrons from another atom to form covalent bond.

(1) Elements may accept three electrons from more metallic elements (electropositive) to form triply charged negative ions and attain noble gas configuration e.g. nitride N^{3-} and phosphide P^{3-} . This shows an oxidation state of -3 in nitrides of some highly electropositive metals such as Mg_3N_2 , Ca_3N_2 , Ca_3P_2 etc. Tendency to form triply charged negative ions decreases down the group.

Reason: Because of increase of size and decrease of electronegativity only Nitrogen and Phosphorus show -3 O.S. (Only small atom can form highly charged negative ions due to greater electro negativities). Bi hardly forms any compound in -3 oxidation state.

(2) +3 and +5 O.S is also exhibited by elements of this group. +5 oxidation states are not known due to high ionization enthalpy. Down the group +3 oxidation state increases while that of +5 decreases. +5 in oxidation state of Bi is less stable than that of Sb. This is due to inert pair effect (as ns^2 electrons do not take part in the bond formation). The +3 oxidation state becomes more and more stable on moving down the group. Because of energy considerations, these elements cannot lose all the five valence electrons. Therefore, they do not form M^{+5} ions and all the compounds of group 15 elements having +5 oxidation state are essentially covalent compounds i.e., PF_5 , PCl_5 , SbF_5 , BiF_5 , etc. NCl_5 is not known but PCl_5 is known. Because nitrogen does not possess any vacant d-orbitals in its valence shell which can enable it to extend its octet. It may be noted that the maximum covalency of nitrogen is restricted to four because it does not have vacant d-orbitals in its outermost valence shell ($n=2$). Therefore, only four (one 2s and three 2p) orbitals are available for bonding and it cannot extend its valency beyond four e.g. NH_4^+ , $(\text{CH}_3)_4\text{N}^+$ etc. That is why nitrogen does not form NCl_5 . Phosphorus has empty d- orbital and can utilize all their valence orbitals to exhibit covalency of five or six. Nitrogen and phosphorus also show oxidation state of +4 because of the ability of one lone pair on NH_3 and PH_3 to form dative bonds with Lewis acids.

However, nitrogen can exist in various oxidation states from -3 to +5 in its hydrides, oxides and oxoacids as given below:

Decrease in melting point of Sb and Bi is because of their tendency to form three covalent bonds instead of five covalent bonds, due to their inert pair effect. As a result,

Compound	NH ₃ Ammonia	N ₂ H ₄ Hydrazine	NH ₂ OH Hydroxyl amine	N ₂ Nitrogen	N ₂ O Nitrous oxide	NO Nitric oxide	N ₂ O ₃ Nitrogen trioxide	N ₂ O ₄ Nitrogen tetraoxide	N ₂ O ₅ Nitrogen pentaoxide
Oxidation state	-3	-2	-1	0	+1	+2	+3	+4	+5

4. Metallic character: It increases down the group. Due to increase in atomic size, outer electron gets farther from the nucleus. Electron becomes more loosely bound and has a tendency to be lost readily. Hence ionization enthalpy decreases, metallic character increases.

[N P] [As Sb] [Bi]
Non metal metalloids metal

5. Electronegativity: Group 15 elements have smaller size and greater nuclear charge than group 14.

G-14 C=2.5 Si=1.8 Ge=1.8 Sn=1.8 Pb=1.9

G-15 N=3 P=2.1 As=2.0 Sb=1.9 Bi=1.9

Group 15 elements are more electronegative than group 14 elements. Therefore, electronegativity decreases, metallic character increases. On moving down the group, the electronegative value decreases. This is due to increase in size of atom and shielding effect of inner electron shell (attraction by the nucleus for the electron).

6. Melting and boiling points: Melting point of group 15 elements first increases from nitrogen to arsenic and then decreases to antimony and bismuth.

Melting point decrease down the group due to increase in their atomic size.

Melting Point N P As Sb B
(K) 63 317.1 1089 903.1 544.4

the attraction among their atoms is weak and hence their melting points are low. Because of large size of atoms, Bi has still weaker interatomic forces than Sb and therefore, has still lower M.P.

7. Catenation: Property of self linking is also shown by group 15 elements but to lesser extent. Nitrogen has little tendency for catenation up to three N atoms. e.g. in hydrazoic acid (N₃H), azide ion (N₃⁻) has three N atoms bonded together. Phosphorous has a distinct tendency for catenation forming cyclic as well as open chain compounds consisting of many phosphorous atoms.

8. Allotropy: Except Nitrogen and Bismuth, all other element of this group shows allotropy.

Phosphorous exist as: white, black or red P

Arsenic exist as: yellow or grey as

Antimony exist as: yellow or silvery grey allotropic forms

9. Electronic configuration of group 15 elements:

Electronic configuration of group 15 elements
General E.C. = ns²np³

Element	Atomic number	complete electronic configuration	With inert gas core
Nitrogen	7	1s ² 2s ² 2p ³	[He] 2s ² 2p ³
Phosphorous	15	1s ² 2s ² 2p ⁶ 3s ² 3p ³	[Ne] 3s ² 3p ³
Arsenic	33	1s ² 2s ² 2p ⁶ 3s ² 3p ⁶ 3d ¹⁰ 4s ² 4p ³	[Ar] 3d ¹⁰ 4s ² 4p ³
Antimony	51	1s ² 2s ² 2p ⁶ 3s ² 3p ⁶ 3d ¹⁰ 4s ² 4p ⁶ 4d ¹⁰ 5s ² 5p ³	[Kr] 4d ¹⁰ 5s ² 5p ³
Bismuth	83	1s ² 2s ² 2p ⁶ 3s ² 3p ⁶ 3d ¹⁰ 4s ² 4p ⁶ 4d ¹⁰ 5s ² 5p ⁶ 5d ¹⁰ 6s ² 6p ³	[Xe] 4f ¹⁴ 5d ¹⁰ 6s ² 6p ³

Assignment

- Which of the following has highest ionization enthalpy?
(A) P (B) N (C) As (D) Sb
- Which one of the following elements is most metallic?
(A) P (B) AS (C) Sb (D) Bi
- Which of the following elements of group 15 does not show allotropy?
(A) phosphorus (B) arsenic (C) nitrogen (D) antimony
- The most electronegative element in group 15 is-----
(A) AS (B) Bi (C) P (D) N
- The maximum oxidation state exhibited by nitrogen is -----
(A) +5 (B) +3 (C) +6 (D) +2
- Why does nitrogen show catenation properties less than phosphorus?
(A) because nitrogen has small size and N-N single bond is weak
(B) because P-P bond is weaker than N-N bond
(C) phosphorus has a tendency for catenation because of low bond enthalpy

- (D) nitrogen is comparatively large in size so that lone pairs on N atoms do not repel each other.
7. Why is Bi (V) a stronger oxidizing agent than Sb (V)?
 (A) +5 oxidation state of Bi is less stable than +5 oxidation state of Sb
 (B) the stability of +5 oxidation state increases on moving down the group
 (C) Sb (V) is a stronger oxidizing agent than Bi (V)
 (D) none of these
8. Nitrogen differs from other elements of the group due to ----
 (A) small size, high electronegativity, absence of d-orbitals in the valence shell
 (B) large size, low electronegativity, absence of d-orbitals in the valence shell
 (C) small size, tendency to form $p\pi-p\pi$ bonds with itself, presence of d-orbitals in the valence shell
 (D) none of these.
9. Nitrogen family exhibits two important oxidation states +3 and +5 but +3 oxidation state is formed because of -----
 (A) small size
 (B) inert pair effect
 (C) high electronegativity
 (D) absence of d-orbitals in the valence shell.
10. What is inert pair effect?
- (A) the reluctant of the s-electro pair to take part in chemical combination
 (B) s-electron present in outermost shell take part in chemical combination
 (C) on moving down the group the stability of +5 oxidation state decreases while that of +3 oxidation state increases due to inert pair effect
 (D) none of these.
11. The unexpected decrease in the melting point of Sb to Bi is because of -----
 (A) their tendency to form three covalent bonds instead of five covalent bonds, due to inert pair effect
 (B) small size of bismuth
 (C) antimony is metalloid
 (D) none of these
12. Why does not nitrogen form pentachloride like phosphorus?
 (A) nitrogen does not have d-orbitals in its valence shell
 (B) because of increase of size and decrease of electronegativity
 (C) due to increase in atomic size, outer electron gets farther from nucleus
 (D) high electronegativity of nitrogen
13. Nitrogen, the first member of group 15, differs from its rest of family members. This may be due to -----
 (A) its small size
 (B) its high ionization enthalpy and electronegativity
 (C) absence of d-orbitals in its valence shell
 (D) all of above

-	13 (D)	12 (A)	11 (A)	10 (A)	9 (B)	8 (A)
7 (A)	6 (A)	5 (A)	4 (D)	3 (C)	2 (D)	1 (B)

Answers



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A hundred times every day I remind myself that my inner and outer life are based on the labors of other men, living and dead, and that I must exert myself in order to give in the same measure as I have received and am still receiving.

Albert Einstein

Nature is a beautiful integration of different entities. Mathematics and science only discover them.

Euler's Identity $0 = 1 + e^{j\pi}$ is an excellent example of integration. Each of the constituent was discovered independently, by different mathematicians, at different point of time.

Yet they all complement each other.

Lest it not be there whole nature shall have to rediscovered

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GROWING WITH CONCEPTS

Concepts of an expert are not like a static foundation of a huge structure; rather it is like blood flowing in a vibrant mind.

Growing into an expert, is a process during which each one must have used best of the books available on subject and received guidance of best of the teachers. Authors might have had limitations to take every concept thread bare from first principle and so also must be the constraint of teacher while mentoring a class with a diversity of inquisitiveness and focus. As a result, there are instances when on a certain concept a discomfort remains. The only remedy is to live with the conceptual problem and continue to visualize it thread bare till it goes to bottom of heart and that is an ingenious illustration.

In this column an effort is being made to take one topic on Mathematics, Physics and Chemistry in each e-Bulletin and provide its illustration from First Principle. We invite all experts in these subjects to please mail us their ingenious illustrations and it would be our pleasure to include it in the column.

We hope this repository of ingenious illustrations, built over a period of time, would be helpful to ignite minds of children, particularly to aspiring unprivileged students, that we target in this initiative, and in general to all, as a free educational web resource.

This e-Bulletin covers – a) [Mathematics](#), b) [Physics](#), and c) [Chemistry](#). This is just a beginning in this direction. These articles are not replacement of text books and reference books. These books provide a large number of solved examples, problems and objective questions, necessary to make the concepts intuitive, a journey of educational enlightenment.

Looking forward, these articles are being integrated into [Mentors' Manual](#). After completion of series of such articles on Physics it is contemplated to come up representative problems from contemporary text books and Question papers from various competitive examinations and a guide to their solutions in a structured manner, as a dynamic exercise to catalyse the conceptual thought process.

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SCIENCE QUIZ: June'2020**Kumud Bala**

1. Benjamin Franklin showed lightning in ----
(A) 1725 (B) 1527 (C) 1752 (D) 1572
2. The charge acquired by a glass rod when it is rubbed with silk is -----
(A) negative (B) positive
(C) both (A) and (B) (D) none of these
3. Interaction of charges is called ----
(A) lightning (B) electrical discharge
(C) earthing (D) electricity
4. Sparkers can be seen on electric pole. When wires become ----
(A) loose (B) tight
(C) wrinkle (D) none
5. Lightning occurs due to -----
(A) electric discharge (B) rain
(C) wind (D) lord Varun's anger
6. The like charges ----
(A) repel each other
(B) attract each other
(C) no interaction takes place
(D) all of these
7. An electroscope is a device which is used to find if an object is ----
(A) charged (B) magnetic
(C) free of cracks (D) hot
8. Electric current is to be passed from one body to another. For this purpose, the two bodies must be joined by ---
(A) cotton thread (B) plastic string
(C) copper wire (D) rubber band
9. The movement of the earth's plates causes -----
(A) cyclones (B) lightning
(C) earthquake (D) thunderstorms
10. Two charged objects are brought close to each other. Choose the most appropriate statement from the following options.
(A) they may attract
(B) they may repel
(C) they may attract or repel depending on the type of charges they carry
(D) there will be no effect
11. Which of the following is not likely to cause tsunami?
(A) A major nuclear explosion under sea
(B) earthquake
(C) volcanic eruption
(D) lightning
12. The earth's plate responsible for causing earthquake is -----
(A) the crust of the earth
(B) the mantle of the earth
(C) the inner core of the earth
(D) the outer core of the earth
13. Consider the list of terms given below: (i) seismic zone (ii) fault zone (iii) mantle (iv) inner core The boundaries of the earth's plate are known as ----
(A) (i) and (ii) (B) (i) and (iii)
(C) (iii) and (iv) (D) (ii), (iii) and (iv)
14. The outer layer of the earth is called ----
(A) mantle (B) outer core
(C) crust (D) inner core
15. Major earthquakes are less likely to occur in -----
(A) north-east India (B) rajasthan
(C) rann of Kutch (D) Orissa
16. Consider the list of terms given below:
(i) tsunami
(ii) landslides
(iii) floods
(iv) lightning Earthquake can cause----
(A) (i), (ii) and (iii) (B) (ii) and (iv)
(C) (ii), (iii) and (iv) (D) (iii) and (iv)
17. State which of the following statements is false.
(A) earthquake occurs anytime all over the world
(B) the plates of the outermost layer of the earth are always in continuous motion
(C) tremors on the earth can also be caused by eruption of a volcano
(D) the process of electric discharge cannot occur between clouds and the earth

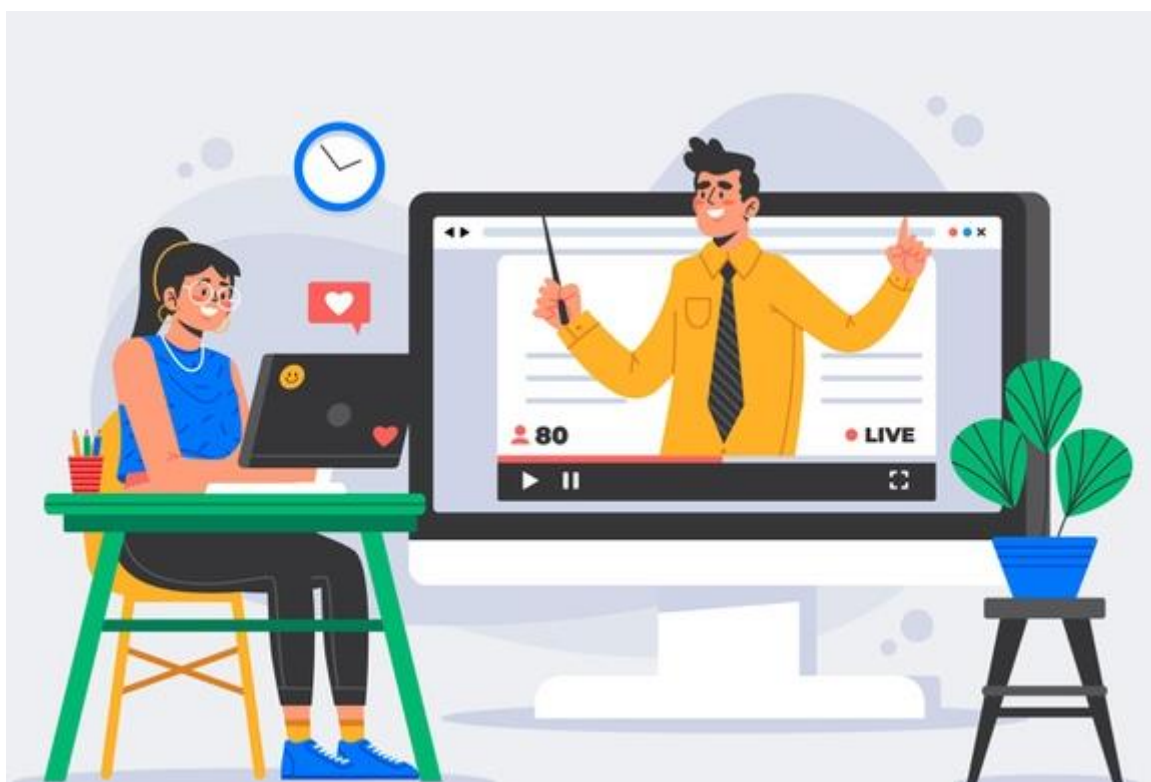
18. What precautions would you take if lightning occurs while you are outside the house?
(A) do not stand underneath a natural lightning rod such as pole or a tall tree
(B) stand away from any fountain or any other water body
(C) stay away from tractors or other metal equipments like wire fences, metal pipes, rails etc.
(D) all the above
19. Richter scale is related to -----
(A) thunderstorm (B) thermometer
(C) earthquake (D) lightning
20. Which instrument is used to measure earthquake?
(A) polygraph (B) seismograph
(C) barometer (D) thermometer
21. The waves produced on the earth's surface are called -----
(A) radio waves (B) longitudinal waves
(C) microwaves (D) seismic waves
22. Where is the lightning rod attached to protect the building from lightning?
(A) on the top of building
(B) in the middle of building
(C) on the bottom of building
(D) all of the above
23. Lightning always follows -----
(A) rain (B) thunder
(C) the easiest path (D) a straight path
24. Lightning conductor is used ----
(A) to destroy the building
(B) to protect the building
(C) both (A) and (B)
(D) none of these
25. The process of transfer of charges from a charged object to the earth is called ----
(A) lightning (B) oscillation
(C) earthing (D) electron movement
26. The point from where the shock waves of an earthquake originate is called -----
(A) epicenter (B) seismic focus
(C) focal depth (D) none of these
27. The magnitude of an earthquake is measured in -----
(A) Kelvin scale (B) Celsius scale
(C) Decibel scale (D) Richter scale
28. Which kind of material is used to transfer charges from one body to another?
(A) metal conductor
(B) non-metal conductor
(C) insulator
(D) none of these
29. What are the natural calamities caused by earthquake?
(A) floods, landslides, tsunamis
(B) winds storms, cyclones
(C) lightning, thunder, volcano
(D) none of the above
30. In which direction does the shock waves produced by an earthquake travel?
(A) both on the surface and inside the earth
(B) only on the surface
(C) only inside the earth
(D) none of these
31. Who discovered the static electricity or lightning in clouds?
(A) Benjamin Franklin (B) Einstein
(C) William Nicholson (D) none of these
32. Which of the following cannot be charged easily by friction?
(A) a plastic scale (B) a copper rod
(C) an inflated balloon (D) a woolen cloth
33. When a glass rod is rubbed with a piece of silk cloth, ----
(A) the rod and the cloth both acquire a positive charge
(B) the rod becomes positively charged while the cloth has a negative charge
(C) the rod and the cloth both acquire a negative charge
(D) the rod becomes negatively charged while the cloth has a positive charge
34. A major earthquake occurred on 8th October 2005 in -----
(A) Gujarat (B) Delhi
(C) Haryana (D) North Kashmir
35. A major tsunami occurred in the Indian ocean on ---

- (A) 26th December 2001
(B) 26th December 2002
(C) 26th December 2003
(D) 26th December 2004
36. How is lightning useful?
(A) lightning is effective in the formation of ozone in nature
(B) lightning played an important role in the origin and evolution of life on earth
(C) due to high discharge of electric charge through air nitrogen contributes with oxygen to form nitrogen dioxide gas
(D) all of the above
37. To make the house earthquake safe, what precautions should be taken,
(A) the cupboards and shelves are fixed to the walls, so that these do not fall easily
(B) clocks, photo-frames, water heaters should be hung carefully
- (C) both (A) and (B)
(D) none of these
38. When is lightning seen?
(A) when the negative charges from the clouds and the positive charges on the ground meet huge amount of energy is produced as bright light and sound, seen as lightning
(B) when the positive charges from clouds and the positive charges on the ground meet huge amount of energy is produced as bright light and sound, seen as lightning
(C) both (A) and (B)
(D) none of these
39. What type of charge is present on the earth?
(A) the earth has only positive charge
(B) the earth has both positive and negative charges
(C) the earth has only negative charge
(D) none of these

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(Answers to this Science Quiz shall be provided in Monthly e-Bulletin)

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Theme Song :

PREMISE: We are pleased to adopt a song “ इतनी शक्ति हमें देना दाता.....” from a old Hindi Movie *Do Aankhen Barah Haath* दो आँखें बारह हाथ of year 1957, directed by The Late V. Shantaram. The lyrics are by Shri Bharat Vyas, singer Melody Queen Sushri Lata Mangeshkar, and Music Direction by Vasant Desai. It has become a widely accepted inspirational song and/or prayer in many educational institutions and socially inspired initiatives engaged in mentoring of unprivileged children. This newly formed non-organizational initiative, being selflessly operated by a small set of compassionate persons, finds its philosophy in tune with the song and conveys its gratitude to all the eminent persons who brought out the song in a manner that it has attained an epitome of popularity. While working its mission and passion, the group invites one and all to collectively complement in grooming competence to compete among unprivileged children. The song/prayer goes as under -

इतनी शक्ति हमें देना दाता, मन का विश्वास कमजोर होना
हम चले नेक रस्ते पे हम से, भूलकर भी कोई भूल होना ॥

दूर अज्ञान के हो अंधेरे, तू हमें ज्ञान की रोशनी दे
हर बुराई से बचते रहें हम, जितनी भी दे भली ज़िन्दगी दे
बैर होना किसी का किसी से, भावना मन में बदले की होना ॥

इतनी शक्ति हमें देना दाता, मन का विश्वास कमजोर होना
हम चले नेक रस्ते पे हम से, भूलकर भी कोई भूल होना ॥

हमना सोचें हमें क्या मिला है, हम ये सोचे किया क्या है अर्पण
फूल खुशियों के बाँटे सभी को, सबका जीवन ही बन जाए मधुबन
अपनी करुणा का जल तू बहा के, कर दे पावन हर एक मन का कोना ॥

इतनी शक्ति हमें देना दाता, मन का विश्वास कमजोर होना
हम चले नेक रस्ते पे हम से, भूलकर भी कोई भूल होना ॥



**Together Each Achieves More
(TEAM)**

*Every end, so also end of this e-Bulletin, is a pause for a review, before
Resuming of the journey far beyond ...*