GYAN VIGYAN SARITA:शिक्षा

A non-organizational, non-remunerative, non-commercial and non-political initiative to Democratize Education as a Personal Social Responsibility (PSR) 5th Monthly e-Bulletin dt 1st March'19, Fourth Year of the Publication



A Tribute to The Martyrs of The Nation



We at Gyan Vigyan Sarita pay a deep felt tribute to all the CRPF soldiers who laid their lives guarding our safety and security with dedication and commitment. The 14th of February will be marked each year as a special day of remembrance for paying homage to "brave hearts who sacrificed their lives for nation and innocent victims of terrorism."

As India stands united in its response to offer material and emotional support to their families, Gyan Vigyan Sarita humbly offers to stay connected with the children of martyred soldiers and those on border through our Interactive Online Mentoring Sessions (IOMS) with a sense of Personal Social Responsibility (PSR). We hope that this on line mentoring can assist the children in excelling further in their educational pursuits.

We seek inclusion and collective complementing of efforts in ongoing programmes being run by CRPF, Defence Services or any other government department that aim at providing educational support for enhancing competencies of children living in difficult circumstances. Our contributions are sincere and voluntary. We view them as token contributions to show solidarity to all affected by either such sudden deprivations or staying away from family in discharge of their patriotic duties.

ॐ शांतिः! शांतिः! शांतिः!

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CONTENTS: (Against Each Content Page Number is Indicated for Convenience)

IOMS Graphical perspective (3)

IT Infrastructure (4)

Editorial – मार्च: ओज और स्फूर्ति का महीना (5)

Coordinator's Views- Economics Relevance of Quality : Education (7)

An Appeal (11)

Our Five Year's Journey (19)

Our Mentoring Philosophy (43)

Regular Columns

- 🦻 दाज ए बयां: डूबती आँखों के चमकते सपने-बांधवगढ़ यात्रासमीर लाल 'समीर'(12)
- > Ayurveda Health Care: Winter Food Dr Sangeeta Pahuja (14)

Articles

- > Commentary on Air Pollution Melina S. Magsumbol-Samaddar (16)
- Development V/s Nature Prakash Kale (18)
- National Defence Academy Prof. SB Dhar (20)
- > Jharkhand Government Tool Room, Ranchi (21)

Poems

- > वो वादी जो कभी जन्नत थी मृणालिनी घुळे (22)
- पथिक डॉ. संगीता पाहुजा (22)
- > बिनती ले. कर्नल (डॉ.) प्रमोद देवगिरीकर(23)
- 🌶 मैं हूँ TOOL & DIE MAKER Johan Mahto (23)

Students' Section

- * माँ तू होती तो... बिभाष कुमार (24)
- * श्रद्धांजलि आकाश गुप्ता (24)
- * **Concentration** Chandi(25)
- * **Circle Art** M. Pavan Kumar (25)
- * An Essay: How will the increasing energy influence International Peace Cooperation and Security -B. Bhagyasrilakshmi (26)
- * Video Games Bala Venkata Swaroop (27)

Growing With Concepts (28)

- Mathematics: Let's Do Some Problems in Mathematics-VI (Focus NDA) Prof. SB Dhar (31)
- > **Physics:** Mechanics: Foundation of Physics (37)
- Chemistry: Liquefaction of Gases Kumud Bala (41)

Quizzes

- Crossword Puzzle: Festivals of India Prof. SB Dhar (367)
- Science Quiz: March-2019 Kumud Bala (48)

From Previous e-Bulletin

Answers to Science Quiz: FebruaryI'19– Kumud Bala (29)

Answer: Crossword Puzzle January'19 – Examination – Prof. SB Dhar (30)

Invitation for Contribution of Articles (14) Theme Song (50)

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Aim at the Best, but...



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

AND Broadband-Internet Connection

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



Cloud Internet

(Linking platform : cloud based with as low bandwidth as possible for seamless connectivity of audio-video whiteboard across nodes where internt connectivity is poor- Presently A-VIEW is in use)









Mentoring

atre

inthe see here the



earning

Centre - 2

Learning

Centre - 3

Learning

Centre



Learning Centre - n



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.i n/contact/



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

| Learning Center (II asked for | by Mentor) | Mentoring Center (II asked for by Mentor) | | | |
|--------------------------------------|-------------------|---|-----------------------------|--|--|
| | Estimated Cap | oital Cost (One Time) | | | |
| Particulars | Cost (in Rs) | Particulars | Cost (in Rs) | | |
| Desktop (without monitor) | 20,000 | Laptop | 25,000 | | |
| Projector | 15,000 | Projector | - | | |
| Web camera | 10,000 | Web camera | - | | |
| Mixer cum amplifier with Speaker | 15,000 | Headset with Microphone | 3,000 | | |
| and Wireless microphones | | | | | |
| Wireless Surface Writing device | 15,000 | Wireless Surface Writing device | 15,000 | | |
| Total | 75,000 | | 43,000 | | |
| | Estimated | l Recurring Cost | | | |
| Internet charges, based on estimate | d monthly data | Internet charges, based on estimat | ed monthly data transfer | | |
| transfer which depends upon choice o | f cloud platform, | which depends upon choice of cloud p | latform, and tariffs of ISP | | |
| and tariffs of ISP | | | | | |
| Cloud platform : | 1 | IOMS is since an initiation driver with Demonal Social | | | |
| a. A-VIEW indegeneously deve. | loped by Amrita | IOMS is since an initiative driv | en with Personal Social | | |
| University. It is found to | be best among | (ZETA) having the Cloud Platform has | Zero-Fund-&-Zero-Asset | | |
| available options for use in IC | JMS. It has been | (ZFZA) basis, the Cloud Platform ha | is to provided by Learning | | |
| Online Education with hilt | and and a minute | be pleased to coppet Learning | 5. Gyan vigyan Sarita will | | |
| Onnie Education, with Dhat | | be pleased to connect Learning | Centers for conectively | | |
| access, in an interactive | manner. Cloud | complementing the cost of Clo | ud Platform, whenever | | |
| platform. | | payable, for arriving at a mutual agr | eement for cost sharing. | | |
| b The IOMS environment core | vion unto Fivo | So also IT Infractructure with the | Montors has been in use | | |
| D. The TOWIS envisages sess | for the plotform | and is working. But at any stage if upgredation becomes | | | |
| whonour psychla may be | barad agrada in | and is working. Dut, at any stage | tong honoficiarios of the | | |
| mutual agreement between I | anning Contons | initiative is gratefully welcomed on | ZEZA basis | | |
| | earning Centers. | initiative, is grateruny welcomed on | ZIZA Dasis. | | |
| c Benefit of sharing of charges of | of cloud platform | Operating cost of Mentor if requir | ed shall be supported by | | |
| can be optimized with off | set of schedule | Learning Centers | ed, shall be supported by | | |
| among multiple sessions of | f IOMS to the | | | | |
| extent Mentor can deliver. | . 10000, to the | | | | |

Infrastructural requirement for Centers in Interactive Online Mentoring Sessions (IOMS) Learning Center (if asked for by Mentor) Mentoring Center (if asked for by Mentor)

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 centers and mentoring centers.

These specifications have been updated based on experience of operation of IOMS with available options. Whiteborad application in the tried out cloud platforms are a bit inadequate in terms of writing lucidity. This deficiency is being managed with Microsoft OneNote application. Suggestions for a proper Whiteboard application as a shared space are welcomed; it will be extremely helpful in exploiting Interactive feature of IOMS with a wireless surface-writing device at each learning center.

Web Camera: Logitech HD 1080p, with a tripod or wall mounting

Projector: Portronics LED Projector Beam 100", 100 Lumen, 130" Screen size, 800x480px resolution

Mixer-cum-Amplifier: Ahuja Make PA Mixer Amplifier Model DPA-370, 30 W Max/37W Max, with Two Cordless Mikes and Speakers. This device offers echoless input/output communication with base computer and Mikes and Speakers in the Class.

Cloud Platform: A-VIEW (Amrita Virtual E-Learning World) developed by Amrita University in association with IIT Bombay, an MHRD, GOI sponsored project. Problems with Whiteboard functionality of A-VIEW are being circumvented with OneNote app of MS Office for IOMS. This has many features of minimizing bandwidth requirements.

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

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

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

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<u> संपादकीय</u>

मार्च: ओज और स्फूर्ति का महीना



पुलवामा शहीदों को ज्ञान विज्ञान सरिता परिवार की श्रद्धांजलि और कोटि कोटि नमन!!

मार्च का महीना बदलाव का महीना है। इस महीने से प्रकृति अपना स्वभाव बदलने लगती है, भयंकर ठंड से सुहावनी होना शुरू हो जाती है, पेड़ हरे-भरे होने लगते हैं, नयी पत्तियों से डालियां भरने लगती हैं, आम के पेड़ बौरों से भरने शुरू हो जाते हैं, फूलों की डालियां रंग-बिरंगे फूलों से लदने लगती हैं, उनके चारों ओर तितलियां मंडराने लगती हैं, उन पर भौरे गुनगुनाने लगते हैं, खेत रंग-बिरंगे होने शुरू हो जाते हैं, चारागाह घासों से भर जाते हैं, कोयल की कू कू सुनायी देने लगती है, और दक्षिण से आ रही हवायें अपने साथ महकते फूलों की गंध लाना शुरू कर देती है।

यह वह समय होता है जब विद्यार्थी अपनी कक्षायें बदलने की तैयारी कर रहे होते हैं और ज्ञानविज्ञानसरिता भी अपने नये विद्यार्थियों व नये विद्यालयों के साथ नयापन अपनाने की तैयारी में होती है।

इस वर्ष का मार्च का महीना पहली तारीख से लेकर अंत तक महामानवों, वैज्ञानिकों और भारतीय त्यौहारों को समर्पित है। पहली तारीख को महर्षि दयानंद सरस्वती की जयंती है। तीन तारीख जर्मन गणितज्ञ जार्ज कैंटर (Georg Cantor) का जन्मदिन है जिन्होंने सेट थ्योरी (Set Theory) की खोज की। इसी दिन स्काटलैंड के वैज्ञानिक अलेक्जैंडर ग्राहमबेल (Alexander Graham Bel) की जयंती है जिन्होंने टेलीफोन की खोज की थी। चार मार्च को महाशिवरात्रि है। पांच मार्च अंग्रेज गणितज्ञ विलियम आटरेड (William Oughtred) का जन्मदिन है जिन्होंने स्लाइड रूल की खोज की थी। 8 मार्च को रामकृष्ण परमहंस की जयंती है। इसी दिन अंतरराष्ट्रीय महिला दिवस भी है। 13 मार्च अंग्रेज वैज्ञानिक जोसेफ प्रिस्टले (Joseph Priestley) का जन्मदिन है जिन्होंने आक्सीजन की खोज की थी। 14 मार्च जर्मन भौतिक विज्ञानी अल्बर्ट आइंस्टीन (Albert Einstein) का जन्मदिन है जिन्होंने विश्वप्रसिद्ध Theory of Relativity की खोज की थी। 17 मार्च जर्मन वैज्ञानिक जॉर्ज साइमन ओम (George Simon Ohm) का जन्मदिन है जिन्होंने विदयुत के ओम लॉ (Ohm's Law) की खोज की थी। 17 मार्च अंतरिक्षयात्री इंजिनियर कल्पना चावला का जन्मदिन है। 18 मार्च जर्मन इंजिनियर रुडोल्फ डीजल (Rudolf Diesel) का जन्मदिन है जिन्होंने डीजल मोटर की खोज की थी। 20 को होलिका दहन है व उसी दिन हजरत अली का जन्मदिन है। 21 को होली है। इसी दिन चैतन्य महाप्रभू की जयंती भी है। इसी दिन पारसी नववर्ष भी शुरू हो रहा है। 22 मार्च को हमारा राष्ट्रीय नववर्ष शक संवत 1941 प्रारंभ हो रहा है। इसी दिन गुड फ्राइडे भी है। 23 को शिवाजी जयंती है। इसी दिन

शहीद दिवस है जब भगतसिंह, सुखदेव थापर और शिवराम राजगुरू को अंग्रेजों ने फांसी दी थी। 24 मार्च ब्रिटिश वैज्ञानिक अर्नेस्ट रुदरफोर्ड (Ernest Rutherford) का जन्मदिन है जिन्हें न्यक्लियर फिजिक्स का जनक माना जाता है। 27 मार्च अंग्रेज इंजिनियर और कार डिजायनर हेनरी रोये (Henry Royce) का जन्मदिन है जिन्होंने Rolls-Royce बनायी थी। 31 मार्च फ्रांसीसी गणितज्ञ रेने देकार्ते (René Descartes) का जन्मदिन है जिन्होंने गणित की एक नयी शाखा निर्देशांक ज्यामिति (Coordinate Geometry) की आधारशिला रखी।

भारतीय समुदाय का महाशिवरात्रि का पर्व जहां देवों के देव आदिदेव महादेव से संबंधित है जो केवल बेल, बेर, और पुष्प अर्पण से ही प्रसन्न हो जाते हैं, वहीं होली का रंग-बिरंगा त्यौहार अपने इस उद्देश्य को लेकर आता है कि साल-दर-साल के गिले-शिकवे गले मिलते और रंग में सराबोर होते ही दूर हो जाते हैं।

महर्षि दयानंद सरस्वती आधुनिक भारत के महान चिंतक और समाज सुधारक माने जाते हैं। उन्होंने आर्य सुधारक संगठन -आर्य समाज की स्थापना की थी। वे वेदों की सत्ता को ही सर्वोपरि मानते थे। उनके दर्शन के चार स्तंभ थे-कर्म सिद्धांत, पुनर्जन्म, ब्रहमचर्य और सन्यास। दयानंद सरस्वती के गुरू विरजानंद ने पाणिनी व्याकरण, पातंजल योग, और वेद वेदांग की शिक्षा के बाद उनसे गुरूदक्षिणा में मांगा कि तुम विद्या को सफल कर दिखाओ, परोपकार करो, सत्य शास्तों का उद्धार करो, मत मतांतरों की अविद्या को मिटाओ, और वैदिक धर्म का प्रकाश फैलाओ।

सत्यार्थ प्रकाश स्वामी जी का महान ग्रंथ है जिसमें उन्होंने धर्म में फैली बुराइयों का जिक्र किया है। स्वामी जी का मानना था कि दुनिया को अपना सर्वश्रेष्ठ यदि हम देते रहें तो हमारे पास सर्वश्रेष्ठ अवश्य लौट कर आयेगा।

रामकृष्ण परमहंस एक महान संत और विचारक थे। वह सभी धर्मों की एकता के हिमायती थे। उन्हें मानवता का पुजारी माना जाता है। रामकृष्ण छोटी छोटी कहानियों के माध्यम से लोगों को शिक्षा दिया करते थे। उनकी शिक्षा जातिवाद और धार्मिक पक्षपात को नकारती है। रामकृष्ण वही हैं जिन्होंने अपने जीवनकाल में विवेकानंद जैसा परम देशभक्त और विद्वान संत इस विश्व को दिया। रामकृष्ण परमहंस का कहना था कि जब फूल खिलता है तो मधुमक्खी बिना बुलाये आ जाती है और जब हम प्रसिद्ध होते हैं तो लोग बिना बताये हमारा गुणगान करने लगते हैं। स्वतंत्र भारत ने अपना सरकारी कैलेंडर शक संवत् को बनाया है। यह सामान्य अंग्रेजी वर्ष में 22 मार्च को और लीप वर्ष में 23 मार्च को शुरू होता है। इस वर्ष शक संवत् का 1941वां वर्ष है।

गुड फ्राइडे का त्यौहार इसाई धर्मावलंबी लोग ईसामसीह के सूलीपर चढ़ाये जाने के कारण हुयी उनकी मृत्यु के उपलक्ष्य में मनाते हैं।

छत्रपति शिवाजी महाराज एक कुशल रणनीतिकार थे। इन्होंने 1674 में पश्चिम भारत में मराठा साम्राज्य की नींव रखी थी। उन्होंने कई वर्षों तक औरंगजेब के मुगल साम्राज्य से संघर्ष किया था। शिवाजी का कथन था कि जो मनुष्य समय के कुचक्र में भी पूरी शिद्दत से अपने कामों को करता रहता है उसके लिये समय खुद बदल जाता है। वे कहा करते थे कि स्वतंत्रता एक वरदान है जिसे पाने का हर कोई अधिकारी है।

हजरत अली को मुसलमानों का चौथा खलीफा माना जाता है। हजरत अली लोगों को शांति और अमन का पैगाम दिया करते थे। वह अपने शत्रु से भी प्रेम की शिक्षा दिया करते थे। कहा जाता है कि वह मक्का मदीना में पैदा हुये अकेले व्यक्ति हैं। इनको पहला मुस्लिम वैज्ञानिक माना जाता है।

चैतन्य महाप्रभु भक्तिकाल के एक प्रमुख संत हुये हैं। हिदू मुस्लिम एकता, जाति-पांति, उंच-नीच, छुआ-छूत को दूर करने में उनकी बड़ी भूमिका रही है। उनका सोलह शब्दों का भजन आज भी प्रसिद्ध है-हरे कृष्ण, हरे कृष्ण, कृष्ण-कृष्ण, हरे हरे, हरे राम, हरे राम, राम राम, हरे हरे।

ज्ञानविज्ञानसरिता परिवार निःस्वार्थ कर्म के जरिये समाज में एक नयी चेतना पैदा कर रहा है कि जो भी कुछ करने योग्य हैं उन्हें अपने आसपास के लोगों के लिये अवश्य कुछ करना चाहिये, उनमें दूसरों से सीखने की भावना भरनी चाहिये और ऐसा करते करते स्वयं में भी हमेशा जिज्ञासु बने रहने की चाह जगाये रखनी चाहिये। आइये अल्बर्ट आइंस्टीन की बात को स्मरण रखने की कोशिश करें: कल से सीखो, आज के लिये जियो, कल की आशा रखो, पर प्रश्न करना मत छोड़ो।

INVITATION FOR CONTRIBUTION OF ARTICLES

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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:** Refer 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 <u>20th of each month</u> to enable us to incorporate your contribution in next bulletin, <u>subhashjoshi2107@gmail.com</u>.

We will be pleased 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 <u>Gyan-Vigyan Sarita</u>: 紀紀 due on 1st of ensuing month.
- >This cycle of monthly supplement e-Bulletin <u>Gyan-Vigyan Sarita: 刘래</u> 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: English Georgia, Hindi Nirmala UI, (c) Fon 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, would be provided.

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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It is only a saint or a prophet to keep forgiving evils. Anyone who supports and/or camoulfleges inactions or evils of others, on pretext of divinity or any other excuse is an accomplice in the evil. Such persons are against cause of the larger good and are opposed to the passionately committed selfless mission.



Coordinator's View Economics Relevance of Quality: Education

Whether "affordability begets quality or quality begets affordability?" Answering this question would lead to an understanding of relevance of quality in economics. Both quality and economics are so intertwined that it is unfair to see either in isolation.

Affordability in a nation is based on its economic surplus. This surplus is generated after meeting necessities and essential needs of people at large and not a few. In this context it is essential to appreciate that this world stands alone in this universe. Except for Sun, from which it receives light and heat, rest of the celestial bodies are responsible for its orbital motion. Thus resources on the earth cannot be everlasting whether they are land, mineral, water, air. Increasing population is continuously depleting per capita share. Thus none, whosoever it may be, can enjoy luxury of either abundance or affordability for all the times to come. An observation of economy and level of quality prevalent across nations would reveal that quality consciousness is highest among prosperous nations. This is equally true across people in a society or nation. So also Prosperity and quality of education are mutually interdependent, and is driving point of this article.

Any discussion on the subject needs to define quality; it is about performance expectation from a product or service. Performance has many parameters viz. operation, operating conditions, efficiency, number of outages, average duration of outage, cost of its up keeping etc. Quantification of quality in absolute terms is extremely difficult and hence statistics on consistency of various performance parameters is used to define reliability. In view of this International Standards Organization ISO 8402-1986 defined quality as "totality of features and characteristics of a product or service that bears ability to satisfy stated or implied needs". The Quality Management Systems (QMS) evolved by ISO 9001-2015, the latest, emphasizes upon defining performance standards and processes to ensure that- a) stipulated standards are complied with, b) how assurances of processes stipulated is carried out, and c) efforts to enhance customer satisfaction. Various models of quality improvement have been advanced viz. Six Sigma (SS) to regulate quality through building and monitoring statistics on performance parameters; Quality Assurance (QA) to emphasizes on verification of quality process; Quality Control (QC) which is about testing for detecting deviation of specification beyond permissible tolerance during in-line production, Quality Circle (QCr) is a proactive step to improve upon performance, customer satisfaction, cost reduction, employees safety and anything else that can be thought of by persons directly engaged in production or process, it is an open ended initiative. One peculiar aspect of QMS is that a producer has to stipulate and ensure quality of product or services that are intended. This leads to a proposition where one has to specify quality of product and adhere to it, be it anything; it is for the consumer to choose it based on his necessity, desire or comfort. This forms a premise of quality for further consideration.

Every quality has a buyer and economics of commerce lies in its ability to link producer to a buyer customer of a quality that it can afford. Fact stands that it is the necessity of survival that drives quality concerns. Any act of creating scarcity of a product or service tantamount to driving its users to a boundary of their survival. Therefore, worst a person can do is to drive the scarcity for magnifying profits. Here use of word 'magnifying' instead of 'enhancing' is deliberate because magnification is done of an image, be it

real or virtual, while object continues remain as it is; whereas enhancement is done of the object; it is actual. If users perish the whole proposition of profit would disappear. This gives rise to a question should one even dream of personal gain out of scarcity? Can one help to improve affordability for mutual growth?

This perspective for a nation or an individual is all about sensitivity of subjects to quality and its economic implications; difference lies in area of their influence. Here examples are drawn from footwear and food items which are available over wide spectrum of quality. Their varities are produced since there are customers for each quality depending upon their comfort level which dependents upon psychological and biological adaptability. Later, this analogy shall be extended to quality of education and its economic implications.

Cheapest in foot wear are slippers; they are available right from Rs 40 to 4000/-, the maximum that has been observed, possibility of ever costlier range is not ruled out. A labour who is required to work in open in scorching heat of the sun needs slippers to protect his soles; this is his necessity to be able to earn his and his family's bread for the dinner, and then to start next day on work. One who cant't afford even the cheapest available picks salvaged footwear or material to create slipper like for self. Whereas those who can afford costly footwear, shall try to reach the limit of their affordability. The footwear for the latter is a matter of their comfort or a status symbol, a purely psychological need. But, the labour has no room for his comfort; the cheapest available footwear is his necessity to be able to earn for survival on the day. This triggers footwear. The moment economics of life-cycle of requirement of a product is conceived ploughing of resources in its life cycle starts viz. production, procurement of raw material, engaging labour, production, marketing, transportation, distribution, packaging, procurement of the end product, disposal of salvaged product etc. Here, investment on market research to assess the requirement is taken to be latent. In this process cost of resources would depend upon how organized is the product cycle. Quality of product regulates product life cycle and in turn level of demand on resources. In an unorganized product cycle, in the instant case, raw material may be supplied by rag-pickers from community waste, they have

their dwelling in slums near production facility, and end consumers either in its vicinity or industry centers. This makes it possible to do multi-tasking in supply-chain so as to bring down selling cost to a level which is within reach of its customers. These unorganized processes while consume lots of subsidies and freeship, their inferior quality deteriorates on every shortcut. Such a product-cycle consumes disproportionately high resources by way of: a) consumer undergoing multiple lifecycles in a given period due to short life expectancy of the product, **b**) each cycle draining its needs from reserve of resources, which as per principles of economics are scarce, c) fresh procurement in every cycle, and **d**) burden the ecosystem in disposal of salvage. In this cycle, procurement cost is only perceived by the customer, while he is totally oblivious of other overheads; this includes indirect costs viz. freeships, subsidies, disposal etc. consumed in its life cycle, including cost of his time and travel every time for procurement. A little effort to increase in affordability would tend to reduce drain of economic resources caused by inferior quality and place the system on reliability growth cycle. Here it lands into a paradox "first egg or hen". Somewhere, someone has to take a first step to make a quality product available at an economically affordable price. Once this cycle is triggered, automatically quality as a perspective would grow spirally. Expecting labour, who is dving hard to meet two square meals, is mockery of his tragedy. It tantamount to denying him right of survival.

Same is true for food; a starving person needs food and energy to take next breath. Every next breadth creates an urge in the person to live on; at times one tends to forget that death is eternal. This necessitates every person who is able to afford respectable meals to try that untimely death, at least due to scarcity of food, comes to none. Having encountered such a starving person any effort in search of healthy food is like giving delaying medical help of pretext of complying with urgency of medico legal requirement. Rescue operation for a starving person needs fastest available food with a single care that it is not harmful, to be precise poisonous.

Education is like economics is the domain of social science. There has been a great deal of brainstorming on various aspects of education and estimation of learning outcome. Nationally and internationally many models and initiatives are available, each one has its own brand. Representatives of these brands do assemble on various platforms like conferences. Despite, their motive is not to collectively complement for the cause of education. Their priority is seen to be marketing respective brands with the conflicting interests. Inspite of RTE, showering of wisdom during every national and international deliberation, ground reality on education for a common student seems unfazed. Gradually a sense of complacence grows among deprived children. On the contrary children from affluent families are driven to glamorous education and focuses on extrinsic growth. Such a system is able to garner greater appeal and in turn

business opportunity by way of assuring quick results and materialistic gains, making subject aggressive and arrogant. While creativity driven education system in a long drawn process, without shortcuts aim at intrinsic growth with humility.

Basic aim of education is grooming a child to observe. The sphere of observation grows as child grows, rather it must: if it does not corrective actions are needed. Then follows correlation of observations; it leads to discrimination based on similarities and dissimilarities. These dissimilarities may have desirable or undesirable impact. This calls for enhancing desirable features and diminish undesirable aspects. In real life always remedies are more than one, it is upto an individual to choose or evolve a match mix. Choice of remedy is more a matter of wisdom than knowledge. It is the wisdom that regulates a choice which is affordable and sustainable for coexistence. It is an interdisciplinary pursuit and calls upon human sensitivity, an attribute of personality, and an awareness beyond area of one's expertise. Decisions based on mere knowledge are self-centric and tend to ignore impact for the larger good. Implementation of a decision is a matter of skill and it has to be groomed. It is the ability to walk-the-talk. Wisdom is available in abundance and more than that are showers of wisdom. Last but not the least is a review of actions and its aftermath. This is essential since most of the problems and interdisciplinary. situations are Even in mathematical problems all parameters are not quantifiable. Therefore, it requires to assumpe boundary conditions. This creates a learning point similar to that encountered in social sciences and keeps growing spirally.

Thus aim of education is not to provide tools for handling problems in the field of expertise, but inculcate wisdom to be able to evolve remedies and pursue them for the larger good, an essential attribute of personality. An honest introspection by all elites, and their collective wisdom, would reveal that none of the expert has thrived based on academics. The growth has been achieved based on their intrinsic ability to take decisions and implementing them successfully. Even in academics rare are the persons who could adhere to their core discipline right through schooling or graduation.

Unless such creativity is imbibed, all efforts and investment on education system would be consumed in producing monotony. It may produce attractive numbers and demand a greater support from the system. While, quality driven intrinsic creativity would engage in evolving new opportunities of growth and thus relieve burden on economy. Same is true for a society or a nation. Run-ofthe-mill approach does helps in economics of scale which countries like China and Korea. They have used it effectively and developed countries have very smartly transferred on monotonic production to labour intensive countries, and retained prerogative of creativity with them. Real economic growth is achieved based on creativity where sky is the limit. Resurgence of Germany and Japan after devastation in 2nd World War is a living example of preserving their creativity. It is the creativity which breeds new opportunities at every new creation.

VVOB, a Brussels based Belgian initiative since 2014 is actively engaged in imparting education in underdeveloped countries defines "a good quality education is one that provides all learners with capabilities they require to become economically productive, develop sustainable livelihoods, contribute to peaceful and democratic societies and enhance individual well-being." The efforts VVOB are appreciated with a wish that this philanthropy is not aimed at exploiting human resource in the target countries to fulfill their commercial ends. Lord Macaulay did the same in India and its influence could not be wiped out in Seven decades of independence.

It is important to note that every country that has flourished economically has tailored its education system based on its needs and cultural strengths. 'Literature is mirror of society' is a globally accepted proposition. Indian scripture is rich in many references of scientific contentions. Even if these are distrusted as scientific fictions, ability to imagine different types of kind or armoury, fire arms, and flying machines deserves to be lauded. Since *there cannot be smoke without fire*, therefore such citations, together with eclipses and dates as per India calendar, is indicative of capability of galaxy of ancient \overline{x} and $\overline{u}\overline{\epsilon}$ to determine with precision motion of celestial objects. This they could do it much before renaissance era in Europe credited for cascaded discoveries. Those Indian calendars are still valid in continuum.

Another important belief that ancient India was not considered to be Golden Bird. It could be true from history of multiple invasions from foreign land?

Upholding Indian heritage with a slogan मेरा भारत महान is not enough to claim superiority either in present or future. Diversity and size of population of our country presses upon us an urgent necessity to grow as strong economy. This can be achieved by addressing needs of quality education by inculcating thought provocation, an essence of creativity, and neither the rote learning nor copy paste. The 5 R's in education, (a. Read Together everyday with your child; **b.** Rhyme, play and cuddle with your child everyday; c. Develop routines, particularly around meals, sleep and family fun; d. Reward your child with praise for successes to build self-esteem and promote behavior; and e. develop a strong and nurturing relationship with your child as foundation for their healthy development). Each of these R's has been there as an integral part of Indian culture. Another important feature of Indian culture is गुरु शिष्य परंपरा,

where गुरु and गुरुमाता performed role of parents in 5R's model.

There is a growing perception that education system should be able to turn person who are employment-ready. Even vocational training institutes cannot fulfill it. Inertia of academics cannot meet pace of technology adoption by industries. Focus of academy is inculcation of thought process, problem solving capability and an openness to new systems, processes and ideas. On the contrary, dynamics of industry is driven by economics of survival. Therefore, it is for industry to customize the creative human resource produced by academy, and dovetail it in its systems and processes. All progressive enterprises and organizations work that way, and accordingly design many HR programmes viz. probation, on-job training, refresher courses, industry-academy interaction etc. Any effort to impose demand of industry readiness on academy is like placing a cart before the horse, and must be thwarted.

Acute demographic disparity in this vast country calls upon role of teacher, mentor or Guru is a matter of passion and not the job. Pursuit of passion brings joy and satisfaction, while it may not cater to their survival necessities. Here, comes role of society and state to take care of needs of passionate teachers. India has undergone a sea change in sociological, cultural. economic and educational parameters. There can neither be a thumb rule nor a single way for us to emerge as an economic power through education. Yet every honest and selfless conviction deserves a fair opportunity of implementation support; this is with a hope that one or more of such creative reform would turn the table. Interactive Online Mentoring Sessions (IOMS) is one such initiative. It is based on a premise of mobilizing elite persons including senior citizens with a sense of Personal Social Responsibility (PSR), a non-organizational, non-remunerative, non-commercial and non-political initiative. Seeds of this model have been sown by a small group of compassionate persons have germinated. But, nurturing the sapling unless taken up by advocates of philanthropy, corporate in CSR, administration and the state, it growth might get jeopardized.

Education is not a subject of either charity or commerce; the earlier would turn target students into parasites, while the later would create exploiters. Educational initiatives are subject of morality whose roots are in compassion; compassion towards those who are deprived of opportunities: it is an act of PSR based on the golden rule: "do unto others as you would have them do unto you." It is neither दान to earn पण्य and neutralize पाप committed knowingly or unknowingly, or an act of philanthropy driven with an urge of स्वान्तः सुखाय; it is selfless inspiration in the form of निष्काम कर्म. In this pursuit quality is desirable, but cannot ride over necessity. Rise of an individual, society or a nation in its subsistence level, an economic parameter, is automatically reflected in quality of life, products and services. It cannot be a step change, it has to grow spirally with a concerted efforts for educational reform; a long term perspective, it just cannot be a short term goal.

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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

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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



The moment I have realized God sitting in the temple of every human body, the moment I stand in reverence before every human being and see God in him – that moment I am free from bondage, everything that binds vanishes, and I am free.

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- Swami Vivekananda

<u>An Appeal</u>: 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:** <u>Interactive Online Mentoring Sessions</u> (<u>IOMS</u>) 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 Nonremunerative, 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 12^{th.} Since then it has gone through many ground level experiences and in July'16 it was upgraded to IOMS, philosophy in action to forward 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 Centeres. Efforts are being made to integerate more learning centers and mentos to diversify its scope.

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 <u>website</u> and operational aspects of can be online accessed at <u>IOMS</u>.

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, (R): 0120-4969970; (M):+91-9711061199,

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अंदाज ए बयां

डूबती आँखों के चमकते सपने-बांधवगढ़ यात्रा

समीर लाल 'समीर'

दो इनोवा वैनों में भरकर पूरा परिवार बांधवगढ़ राष्ट्रीय उद्यान के लिए रवाना हुआ. दोनों गाड़ी, पूरी पैक, शीशे बंद, मनपसंद का संगीत बजाते, हल्का एसी चालू, परिवारिक गप्प सटाकों और हंसी हल्ले में दौड़ रहीं थीं मंजिल की ओर. न कोई धूल, बेहतर सड़क बन जाने से न कोई उछलन. मात्र ३.३० घंटे से कम समय में हम २०० किमी का फासला तय कर बांधवगढ़ पहुँच गये.

पहले से बुक एक अति सुन्दर रिसोर्ट हमारा इन्तजार कर रहा था. चारों तरफ हरियाली , सुन्दरता से सजे हुये दूर दूर कॉटेज करीने से लगाया गया बगीचा और बीचों बीच शाम को बॉन फायर करने के लिये बड़ा सा सीमेन्टेड पंडाल.

कमरे के भीतर की साज सजावट और सफाई काफी मनभावन थी. कमरा बंद करने के बाद मैं सोचने लगा कि बंद कमरे में क्या भारत और क्या अमेरीका ? पिछले कुछ माह पहले जब लास वेगस में था, तब भी कमरे के भीतर तो यही अहसास थे. बल्कि यहीं ज्यादा आराम और लक्ज़री है कि घंटी बजाओ और बंदा चाय नाश्ता लिए हाजिर. वहाँ तो कॉफी/चाय की मशीन कमरे में लगी थी, खुद बनाओ और तब पिओ.

कुछ देर आराम , फिर सब अपने अपने कमरे से बाहर खुले हरे मैदान में. फुटबाल खेली गई. बच्चे , बड़े सभी बराबरी से अपने उम्दा प्रदर्शन की फिराक में. थक कर सब तैयार हुए और हम चल दिये नजदीक में ही बने बांधवगढ़ म्यूजियम को देखने. छोटा सा म्यूजियम-अब म्यूजियम तो क्या-फोटो और पार्क एवं किले के मिनियेचर मॉडल की प्रदर्शनी ही कहें तो बेहतर कि कल क्या देखेंगे. अच्छा लगा एक घंटा वहाँ गुजारना. पुराने राजे महाराजाओं ने कितने टाईगर मार गिराये , उनका लेखाजोखा भी प्रिंट करके टांगा गया था सो उनको समय की मांग के अनुरुप कोस भी लिया कि हाय , कैसे थे ये ? इत्ते निर्दयी. उस कमरे में ऐसा कोसना , एक प्रकार से बोर्ड पढ़ लेने की पावती छोड़ने जैसा लगा. जो पढ़ता था वो कुछ ऐसे ही पावती छोड़ रहा था.

बहरहाल, वहाँ से वापस लौट बॉन फायर के आसपास सारा इन्तजाम पाया गया. फायर को घेरे कुर्सियाँ , कायदे से लगी टेबल.

देर तक महफिल जमीं. जाम छलके, सुर उछले. मौका था तो जी भर के परिवार वालों को अपनी रचनाऐं झिलवाईं. उनकी मजबूरी थी तो जितना बन पड़ा, उन्होंनें वाहवाही का मंजीरा बजाया और नई आई पुत्र वधु ने भी वहाँ जान लिया कि ओह!! तो ऐसे होते हैं कवि और वो भी उसके ससुर. सोचती होगी..ये कहाँ आ गये हम ? :) मगर क्या करे, झेलना तो पड़ा ही! खैर, तय पाया गया कि अगले दिन सुबह ६.१५ बजे सब तैयार मिलेंगे और ६.३० बजे जंगल सफारी की जीपें हमें वन भ्रमण पर ले जायेंगी.

सुबह की कड़कड़ाती ठंड , खुली जीपें , रिसोर्ट वालों द्वारा प्रायोजित कंबल भी मानो सरसराती हवा में पिघले जा रहे हों. कंबल से शरीर गरम हो या शरीर की गरमी से कंबल-समझ पाना मुश्किल था. जंगल के भीतर की सुन्दर मनोहारी यात्रा. पतले पहाड़ी रास्ते. २० किमी की स्पीड़ पर चलती जीप.

पंछियों की चहचहाट , कुछ चीतल , हिरण, मोर आदि दिखे. आनन्द आ गया. इन्तजार था कि कहीं टाइगर दिखे. कहते हैं इस १०५ वर्ग किमी में फैले राष्ट्रीय उद्यान में लगभग २५ टाइगर हैं. जीप धीरे धीरे बिना आवाज के चलती रही और हम चुपचाप आजू बाजू नजर दौड़ाते रहे कि शायद कहीं टाइगर दिखे. एक दो बार बंदर और अन्य जानवारों की आवाज से गाईड ने टाईगर के आसपास होने का अनुमान भी लगाया और जीप रोककर इन्तजार भी किया. उसके पंजे के ताजे निशान भी दिखे मगर महाराज को नहीं दिखना था तो नहीं दिखे. दो घंटे बाद हम पहुँचे सेन्टर पाईंट याने कि भ्रमण के उस स्थल पर , जहाँ से वापसी का ट्रेक शुरु होना था किन्तु रास्ता दूसरा याने अभी भी टाईगर के दर्शन के ५०% चान्सेस बाकी.

सेन्टर पाईंट पर चाय नाश्ते चिप्स केडबरी कुरकुरे की दुकानें, काफी चहल पहल के बीच चिप्स केडबरी की दुकानों से कुछ दूर मेरी मुलाकात हुई गले में टोकनी लटकाये उबले चने को पत्तल में बाँध प्याज मसाला डालकर बेचते बालक मोनू से. चिप्स कुरकुरे की सभ्यता के बीच शायद सुबह से उसे कोई खरीददार नहीं मिल पाया था अतः कुछ उदास सा था उस चहकती अभिजात्य भीड़ के बीच अनसुनी आवाज लगाता-चने ले लो, बाबू जी.

मन नहीं माना तो मैं उससे बात करने लगा. पता लगा वहीं एक नजदीकी गांव में रहता है. रोज २० रुपये के चने खरीद कर लाता है और ३५ से ४० रुपये के बीच बेच कर १० रुपये बना लेता है. बाकी पैसा शायद वहाँ बेच पाने की परमिशन के लिए विभागीय कर्मचारियों के हिस्से जाता हो. कुछ ठीक ठीक उसने नहीं कहा. कम बात करने वाला शर्मीला लड़का था.सैकड़ों की तादाद में आये भ्रमणकारियों में से वो मात्र ७-८ ग्राहक चाहता है अपना पूरा माल खपाने के लिए. फिर १० बजे से गांव के स्कूल में पढ़ने जाता है. स्कूल के कारण शाम का फेरा लगाना संभव नहीं हो पाता. साथ में उसका दोस्त भी था भद्र सिंह. वो साथ सिर्फ खेलने आता है. शायद बेहतर आर्थिक स्थिती वाले परिवार का हो मगर दोस्त के साथ फिर भी घूमने चला आता है. मोनू एक दिन पढ़ लिखकर वन विभाग में नौकरी करना चाहता है. शायद वही जंगल की दुनिया उसने देखी है तो सपने भी वहीं तक सीमित होकर रह गये हों, बहुत स्वभाविक है. अपनी कमाई का हिस्सा बांटते हुए निश्चित ही उसके मन में आता होगा कि कल जब मैं इसकी जगह हूँगा तो किसी मोनू को कोई तकलीफ नहीं दूँगा और अगली पीढ़ी के मोनू की पूरी की पूरी कमाई उसी मोनू की होगी.

मोनू की आज बोहनी भी नहीं हुई थी.उसकी डूबती आँखों में तैरते सुनहरे सपनों की छटा देखने की किसी को फुरसत नहीं. बच्चे हों या बड़े, सब बस एक कुतहल लिए फिर रहें है कि टाईगर कहाँ दिखेगा ? जिसे जो दिशा बता दी जाती है, वह जीप उस ओर मुड़ कर ओझल हो जाती है. और मोनू खड़ा अगली खेप की बाट जोहता है कि शायद कोई उससे उसके उबले चने खरीद ले. उसे किसी टाईगर का इन्तजार नहीं. उसका वन विभाग में नौकरी पाने का सपना ही उसका टाईगर है और वो उसी का पीछा कर रहा है अपने मासूम बचपन को व्यापार की इन चालों के तले रौंदते जिसमें उसे इन १० रुपयों को कमाने के लिए विभाग के लोगों से हिस्सा बांट करते अपने अस्तित्व को बचाये रखने के लिए क्या क्या पाठ नहीं सीखने होते.

मैं उसका फोटो खींचना चाहता हूँ तो वो अपने साथी भद्र सिंह को साथ खड़ा कर लेता है फोटो खिंचवाने. फोटो खींचकर मैं उसकी ओर ५ रुपये बढ़ा देता हूँ. आत्म सम्मानी मोनू यूँ ही पैसे नहीं लेता-वो भी एक दोना चने मेरी तरफ बढ़ाता है. मैं चने हाथ में लिए जीप में आकर बैठ जाता हूँ उस भीड़ का हिस्सा बन जिसे तलाश है टाईगर दर्शन की.

टाईगर नहीं दिखा-टाईगर हर रोज नहीं दिखते. टाईगर का पीछा करना इतना आसान नहीं.

हम वापस रिसोर्ट में आकर अपना सामान उठाते हैं और लंच के बाद शुरु होता है मद्धम संगीत के बीच वापसी का सफर.

थकान से मैं आँखे बंद कर लेता हूँ और मेरी आँखों के आगे मोनू का भोला चेहरा आ जाता है-साहब , आज बोहनी नहीं हुई है!!

आज भले ही उसकी बोहनी न हुई हो लेकिन उसके उदास चेहरे पर झलकते आत्मविश्वास से मैं पूर्णतः आशान्वित हूँ कि एक दिन उसे उसका टाईगर जरुर मिलेगा.

मन ही मन मैं बुदबुदा उठता हूँ , अलविदा मोनू!! मेरी शुभकामनाऐं तुम्हारे साथ हैं. एक दिन फिर मिलेंगे शायद इसी मोड़ पर-तब तुम वन विभाग में होगे. तुम तो शायद मुझे पहचान भी न पाओगे मगर ये वादा रहा , मैं तुम्हारी आँखों से तुम्हे पहचान लूँगा. कम आँखें हैं दुनिया में जो इतना जिन्दा सपना पालती हैं.

निदा फाज़ली साहेब का एक शेर बरबस ही याद आता है न जाने क्यूँ:

कभी कभी यूं भी हमने अपने जी को बहलाया है

जिन बातों को ख़ुद नहीं समझे औरों को समझाया है ..



लोकप्रिय चिट्ठाकार समीर लाल व्यवसाय से चार्टर्ड एकाउंटैंट हैं। आजकल वे कैनैडा में रहते हैं। उन्होंने कहानी लिखना पाँचवीं कक्षा में ही शुरु 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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Education is not job training; the function of education is to instill an appreciation of our place in the flow of time and space, to expand our intellectual and empathetic understanding of nature and people.

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- Jonathan Lockwood Huie

Ayurveda- Health Care

Winter Food

In Winter due to the cold weather, our body needs warming food, and there is craving for rich food which provide warmth along with nourishment. Following food items and Herbs are very helpful in keeping us warm and to stay healthy. All animal foods fall in the warming category like all dairy products, meat, fish, poultry etc.

Grains and Vegetables: Whole grain cereals, proteins and healthy fats too provide much needed energy to keep warm. All tubers (Any vegetable whose edible part grows beneath the surface of the ground) are usually warming. Like Onion, potato, carrot, garlic, radish, yams, sweet potato, turnip etc are warming. Green leafy vegetables like spinach, methi, sarson (green mustard)mint leaves etc. are good to consume in winters. Vitamin A, C, D, E, B6 rich food are good to consume.

High energy and protein rich food items provide required warmth. That's why people make sheera (of wheat flour, moong dal, vermicelli, badam), Halwa(of carrot, pumpkin), oaaj and ladoos in winter. Chapatis of Bajra and corn flour also have the warmth giving property.

Fruits: Fresh and dried fruits like papaya, pineapple, amla murabba, dates are too good to consume in winters.

Consumes Herbs in Winters: Certain herbs have warming qualities and are immunity boosters and balance Tridoshas. Some of them are as under:

Basil Leaves: According to Ayurveda balances Vata and Kapha Dosha. One of the most common and widely used ingredients in many Indian home remedies. It has anti bacterial and anti viral, anti carcinogenic properties. It acts as a detoxifying, cleansing and purifying agent. In the winter season, it's very helpful in relieving from fever, headache, sore throat, cold, cough, flu and chest congestion and other Respiratory ailments like chronic bronchitis. Asthma etc.

Peppermint: Peppermint is widely used in ayurvedic medicines as a carminative and antispasmodic.

In the winters it's very beneficial for dry Skin like Eczema and other itching

problems lesions.Menthol, the essential oil in peppermint is credited with the herb's analgesic, antiseptic, antispasmodic, Decongestant and cooling effects.

Mint leaves: Mint has the ability to relieve chronic pain related to Airthritis and migraine. Mint oil can be applied on the painful areas to alleviate pain. It has anti inflammatory properties, So it is used in many skin care products. Freshly grinded mint leaves with rise water can be applied on face as a face mask to remove tan and other blemishes.

Thyme: Essential oils in Thymes have antiseptic, antiviral, antirheumatic, anti parasitic and anti fungal properties. It is used in all Ayurvedic medicines as an expectorant, diuretic, fungicide and antibiotic.

Ginger: According to Ayurveda ginger is Kapha and Vata pacifying. It is extremely helpful specially in winters. This herb is very helpful in common cold, cough and sore throat.

Garlic: It offers innumerable health benefits. It lowers cholesterol and blood sugar levels.As according to Ayurveda it's Vata pacifying, so it's used as analgesic, antispasmodic in Ayurvedic formulations.

Licorice: According to Ayurveda it's Vata-Pitta pacifying. It is excellent for throat disorders. It has antibacterial, anti-inflammatory and antiemetic properties. It is a very good expectorant and enhances immunity by raising levels of interferon which is the key chemical of immune system that fights off viruses.

It has anti allergic properties, Therefore very helpful in treating allergic rhinitis, conjunctivitis, bronchial asthma. It can be applied on face to improve complexion, to remove blemishes, acne scars.

Psyllium Husk: In Ayurveda psyllium is considered to have pungent, astringent and cooling properties. It balances the Tridoshas. It reduces the inflammation of the digestive tract and alleviate

Dr Sangeeta Pahuja

constipation and haemorrhoids. It helps to reduce acidity. Its the only remedy which can treat diarrhoea and constipation together. Consuming it with water relieves constipation and consuming with curd it cures diarrhoea.

Cayenne: In Ayurveda it's called Vata-Kapha pacifying. It has been used for variety of ailments including indigestion, gout, fever, sore throat, hemorrhoids, tremors, dub, tonsillitis, diphtheria etc. It is very helpful in rheumatic pain or Arthritis. It improves the blood circulation. Medicinal intake of pepper may to help dissolve the clot and ensure that the blood flow is normal. Cayenne is a cardiac stimulant and thus it boosts heart functions.

Black elderberry: It is most commonly known for its medicinal uses in the aid of upper respiratory infections. constipation and fever.

Raw Honey: In Ayurveda it's called Kapha pacifying and yogvahi (synergistic effect). It helps in treating various diseases. There are several benefits of honey. such as reduction of fat, blood purification, the source of vitamins and minerals, source of energy, healing of wounds and much more. You just need to consume honey daily and get the best results.

Cinnamon: It pacifies Kapha and Vata. It is used in many Ayurvedic formulations like for cough, cold, acne, dry skin, hair growth formulations, diabetes, digestive formulations etc.

Ajwain: Thus herb is used in Ayurvedic medicines for it's carminative properties. It is carminative, expectorant. Helpful in cough, cold, influenza, arthritis, asthma and rheumatism. *Saffron*: This herb balances Tridoshas. Saffron has both invigorating and nourishing qualities and bestows it's strongest medicinal actions on the blood. the heart, and the reproductive system.

Hibiscus: This herb is good for both winter and summer, you can drink hibiscus tea as either a hot tea or an iced tea. If you want to keep yourself warm in winter, brew it and drink it straight away. Health benefits of Hibiscus tea include relief from high blood pressure, and high cholesterol, as well as digestive and inflammatory problems. It helps to cure liver disease and reduces the risk of cancer . Hibiscus tea is rich in vitamin C, minerals and various antioxidants.

Chia Seeds: In Ayurveda chia seeds are considered Vata pacifying, optimises Pitta and nourishes Kapha. Chia seeds are also sattvik or pure in nature. According to Ayurveda sattvik herbs helps to encourage the building of ojas, which is your vote vitality, endurance and the foundation of your immunity.

Lemon Grass: It's Vata-Pitta pacifying. Called as the nature's super glue for the human body. It is also known as Fever grass, as it normalizes the body temperature. The remedial properties of lemon grass essential oil are anti septic, antirheumatic, diuretic, anti inflammatory, analgesic, sedative, galactogogue and anti pyretic.

Turmeric: Turmeric is called Haridra in Ayurveda and had been successfully implemented in preventive and curative aspects of many Diseases. It had also been a part of home remedies to combat cold, cough, seasonal disorders, infections, wounds, skin diseases etc.

Above herbs are immunity boosters, and have anti bacterial, anti viral properties and some are expectorant, decongestant, demulcent properties, which balance aggravated Kapha in winters.



Know Ayurveda, Follow Ayurveda and Stay Healthy.

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Commentary on Air Pollution

First week of November, 2017. We all woke up amidst a thick, choking blanket of smog. Post-diwali, Mahagun Modernites and residents across the National Capital Region bracedfor spiraling levels of dust (particulate matter and gaseous vehicular emissions such as carbon monoxide, nitric oxides, sulfur oxides, etc.) in the air even as they went about their normal routines. As a stop-gap measure, schools closed down or changed their timings to prevent children from being further exposed during commuting. Funny how we have adapted and accepted pollution as the price for economic development, for the construction of high rise apartments and running of our cars. However, we only seem to acknowledge the reality of dangerous levels of particulate matter during winter season. Each year, societal outrage peak during winters and wane after the smog disappears in the advent of spring. Why is it that public interest and action cannot be sustained the whole year - do we not realize that every day we are inhaling poisonous air?

There are multiple reasons why Delhi-NCR has high pollution levels throughout the year. A megacity which continues to host a growing population which in turn drive further urban development (think construction boom, more cars, demand for road infrastructure); it has unique geographical and topographical conditions which lead to temperature inversions (where a mix of cold and warm layers of air trap gases and dust at human height level). The extensive ridge forest areas also contribute to fog formation. Rice straw burning from Punjab, Haryana, and UP also drift towards Delhi, and areas near indo-gangetic plains. Emissions from brick kilns in nearby states also contribute high levels of particulate matter in NCR.

Various measures are in place under the Graded Response Action Plan (GRAP), but it's difficult to assess which interventions will work in the long run. Under this plan, the Badarpur power plant will be closed this winter, phased out and eventually shut down in July 2018. UP and Haryana have been directed to monitor thermal power plants in Dadri and Jhajjar (respectively). Control of road and construction dust, garbage burning as well as increased parking fees in Delhi are also included in GRAP. The Delhi government flirted with the idea of instituting another round of the odd-even scheme but later dropped the idea after the National Green Tribunal insisted on a total ban without any exclusions (female drivers, etc.).

Melina S. Magsumbol-Samaddar

There is an important distinction that we must make between the air quality index based on ambient pollution emissions and personal exposures.Pollution emissions from industrial, commercial and roadside vehicular emissions are the main focus of GRAP and monitored by Central Pollution Control Board and State Pollution Control Boards.

Personal exposure is the dose (what we end up inhaling in our bodies) from sources that are close to our daily work or activities, such as secondary tobacco smoke, road side dust, fumes from burning garbage or biomass, smoke from incense or mosquito coils and car exhaust. However, we need to be more vigilant about fixed sources of pollution near our homes which contribute more to our personal exposure thereby more proximate causes of negative health outcomes. Apart from outdoor (ambient) pollution, we must take care of our indoor air quality (household pollution). We spend more time indoors and we need to be careful about using incense and chemicals such as hair spray, insect spray, mosquito coils or household cleaning materials without properly ventilating our homes.

Exposures to air pollution (both ambient and household sources) can cause respiratory and cardiovascular effects. Health effects range from coughing, eye and sinus irritation, fatigue, or respiratory diseases such as asthma, and bronchitis. Long term effects include decreased lung capacity, breathlessness, or heart problems. The most susceptible groups are children, pregnant women and the elderly. Children's lungs and natural immunity are still developing, while pregnant women may experience respiratory ailments and increased blood pressure which may lead to delivering preterm and low birthweight babies. The elderly are mostly suffering from chronic health conditions (diabetes, cardiovascular problems, hypertension, etc.) which will get exacerbated by pollutants.

So what do we do?

1. Exercise is still a must, but be smarter and safer about it: Walking near busy roads or places where a lot of dust gets kicked up is going to cause more exposure. As we exert more energy, our lungs will take in more air leading to higher intake of dust and fumes. Typical adult breathes half a liter of air each breath (200-500 ml), and takes an average of 8-12 breathes a **minute.** The lung has no additional defense mechanism once gaseous pollutants and particulate pass the nasal and thoraxic area. Fine particulates (PM 1-PM2.5) are lodged inside the lungs and cannot be coughed out. Smaller particles (nano particles) go deeper into the alveoli and stay lodged in our cells.

Change the time of your daily walk. Avoid very early morning walks from as 5-6 am. The dust and pollutants from the night before (ex. diesel truck exhaust) are still in the air and will need time to settle.Walk after the morning traffic rush, preferably after 10 am. Or exercise indoors during the early morning. Similarly, avoid walking during the evening rush hour.

- 2. Indoor air can be as dirty as outdoors: We need to be careful in checking indoor air quality. Wet mopping and regular dusting that doesn't circulate more dust will help keep allergies and asthma episodes down. Most households buy air filters; it may be a good idea to keep it in rooms where you spend the most time. However, it can lead to more sensitization when you step outside. Close rooms while mosquito coils (also electric types) are in use. Only enter after the room has been ventilated. Limit exposure of asthmatic family members from incense smoke.
- 3. *Masks protect us from bigger particles, but it's not foolproof*: Masks are recommended especially when a person or a child suffers from asthma or highly allergic. It mostly gives us a measure of psychological comfort about reducing our exposure. For those that have lung disease and difficulty breathing can benefit from air purifiers. However, we cannot rely on personal protective equipment all the time.

- 4. A diet rich in vegetables and fruits is the best personal defense: One of the most effective harm reduction strategies is to adopt a diet of nutrient rich vegetables and fruits. Anti-oxidants present in these foods help our bodies cope with the daily onslaught of pollution and can reduce inflammation in our bodies.
- 5. *Be aware*: You can download the following phone based apps to know the air quality in various Indian cities. SAFAR-AIR (Ministry of Earth Sciences, Govt. of India) report 24-hour average air quality data for Delhi-NCR, Pune, Mumbai and Ahmedabad, and index based on an algorithm taking into account levels of gaseous pollutants and particulate matter. SAMEER (Ministry of Environment, Forests, and Climate Change, Govt. of India)national air quality maps report hourly updatesof the National Air Quality Index for various Indian cities.

We need to take a critical look at the political, economic and social milieu that surround this problem of ours. There are many opportunities for our society to move towards a cleaner, greener environment. The responsibility for protecting our health from air pollution cannot be an individual's responsibility alone. It calls for collective action and the understanding that we are all accountable to keeping our environment healthy and clean. The government alone cannot solve this problem. No amount of air filters or masks will solve this problem. Multi-sectoral action from government, civil society, media, industry, transportation, energy and health sectors will be necessary to manage this problem. Interventions to reduce pollutionwill take years, or even decades and we need to be ready to meet the challenges and sacrifices which may be needed.

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Development V/s Nature

All present day debate about development v/s nature is more about creating a noise to capture attention. When someone says world is changing for the worst, he only means that it is changing in such a way that it is adversely affecting his vested interest (in status quo situation). If you are benefitted by change, the development is progress, if you are adversely affected it is destroying nature.

Someone says development should not be against nature. I ask, can development and nature go together. Nature means, things available to all, development means the man made things which can be used for a price (even for free road we indirectly pay through taxes to government).

Someone says development should not destroy/ change culture. Is it possible? In absence of agricultural economic activity in rainy season and (due not connected with town) alternate economic activity, activities are carried out in villages through traditional culture and religious based functions. In this season, in olden days milk / perishable vegetable could not be sent to market due to dis-connectivity caused by rains. Thus (in such periods) tradition or culture evolved of free distribution of such perishable items. Now, if a road is made and village is connected to town and round the year economic activity is possible, automatically, it will influence traditional ways of forced consumption of commodities. Thus will it be wise to continue old tradition and faiths? Definitely not. Same is true about gender With based relations. education, economic independence and control over birth process, it is unreasonable to force female to continue traditional role; it is bound to influence power equilibrium between male and female in family and in turn in society.

The fact is that every system be it political, social, ethics, economics, science and so on each is affected by changes or development in other systems. For example, Social system affects political system, science affects ethics and so on. **No system is independent of others**.

Further, what is being changed may not be correct or good in first place. What we call History, is just narration of victorious party, it need not be and generally not true. The present laws, are compromise between different groups that can influence process of making law. Highest form of law is constitution of country. It need not be ethical or justifiable that despite laws for reservation for woman in local bodies passed by Parliament / Assemblies it is not implemented for these (very) bodies. Same is true in other disciplines. However, every system develops side effects which generates alternate process/ system and which tend to destroy old one.

Just think, in a debate over nature against development, 'had man not converted forest and developed the agriculture.'; 'If someone had banned paper manufacturing to save forest'; 'Had Sher Shah Suri been blocked to build GT Road on pretext of forest clearance'; 'Had our forefathers chosen nature against development'.

In such a debate there is a loud talk about sustainable development, without understanding its viable limits. Simple (understood) yardstick is that "development up to my generation is sustainable but what my next generation is doing/ developing is not sustainable. Thus petrol wells are OK but mining at Poles is not."

Such opinions are adhoc and to suit our own convenience. There is law to punish, even if you cut one green tree of your back yard. But, environmental clearance is possible for building Roads in Himalaya based on strategic needs. China has built Air port at the base of Himalaya. Can we now stop other developments that will follow?

What is effect of our development activity over nature (negative) and conserving activity for nature (positive) ? We measure air and water quality of city and interpolate it for whole earth, and say whole nature is being polluted or destroyed. We clean some ponds and say that we saved nature. Compare it with the devastating natural phenomenon in the form of Tsunami, Earth Quack and Volcano etc. Latest is volcano in Iceland which disrupted air Traffic in Europe. Similarly, if we just calculate the cleaning **power** of Solar Energy; this is the mother of all renewable energy sources through regeneration of **biosphere**, vaporization of water and raining. I wonder whether any day man can pollute the earth that much or his cleaning effort will ever match with nature's cleaning power.

If our effort is to have so little effect, either way, why so much noise? Remember, every communication has purpose, but it may not be true. Same may be said about communications for and against development. There is marketing efforts of companies that are benefitted by the fear generated through destruction of nature. Developed world says, we have polluted world but developing world should not pollute the world. Developing world says enough

Prakash Kale

of your pollution, now you stop and it is our turn now. Both exaggerate damage being done by development, just to stop other party and debate and negotiations goes on just to protect or improve own positions.

To be philosophical and with a belief in Geeta "What are we able to create? What are we to destroy?" Absolutely nothing. We are at most changing the form of things. Today, if we are not able to use some changed material but it does not mean it has lost its intrinsic value or utility. In present time's coal is nothing but compressed/ destroyed forest which got deep buried millions of years ago. Similarly, today's waste will find some use in some form in a civilization that may come up later.

To conclude, nature is too powerful to be destroyed by our development. Development will only bring changes in our different systems. It does not mean that we should behave irresponsibly, and stop cleaning rivers, planting trees etc. These are essential to protect or improve our local environment and reduce cost of living for ourselves; but to link it with big concepts like **<u>saving of earth</u>** etc. is ego of man only.

Outcome of the debate would reveal that format of today's life is a result of development in past. Need of development would grow with growing demand and dependence of people on developments. Thus there would a consensus for continuance of development with a care to preserve nature to the extent possible.



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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."

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Albert Einstein



Start: June-2012

<u>हमारा पंचवर्षीय प्रवास</u>

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पारम्परिक शैक्षणिक मार्दर्शन से प्रारम्भ कर आज हम तकनीकी-विकास के सहारे मूलभूत प्रासंगिकता को आगे बढ़ने में संलग्न हैं. यह प्रयास अपने सामाजिक कर्त्तव्य के प्रति सहजविनीत आग्रह है; कृपया इस पर विचार करें.



National Defence Academy

Prof. SB Dhar

The National Defence Academy **(India)** is an Institution for the **military education**. It trains Indian nationals as well as the friendly foreign countries' nationals for being future officers and gentlemen. This academy was established on 7th December 1954 in Khadakwasla near Pune in Maharashtra.

The training at NDA equips the cadets with mental, moral and physical attributes required to cope with the challenges of the future battlefield with the aim of To join NDA, a candidate should appear in the entrance examination conducted by UPSC, New Delhi. This entrance examination is conducted twice a year.

The eligibility criteria for the examination:

- (a) The aspirant must be a class 12th Pass for the Army.
- (b) The aspirant must be a class 12th Pass with Physics and Mathematics if he wishes to join Air Force or Navy.
- (c) The aspirant should be unmarried.

The Applicants to the NDA are selected via a **written examination** followed by **extensive interviews** by the <u>SSB</u> covering <u>general aptitude</u>, <u>psychological</u> <u>testing</u>, team skills as well as <u>physical and social</u> <u>skills</u>, along with the <u>medical tests</u>.

Incoming classes are accepted twice a year for semesters starting in July and January. About 4,50,000 applicants sit for each written exam**ination** every year. About 6,300 of these are invited to interview. Only unmarried male candidates are eligible for NDA & NA Examination. The minimum age should be 16 and half years and maximum age should be 19 and half years.

The Applicants who want to join the **Air Force** go through a **Pilot Aptitude Battery Test** also. About 320 cadets are accepted to the academy each semester. About 70 cadets are accepted for the Air Force, 42 for the Navy and 208 for the Army.

The Cadets who successfully complete the courses are sent to their respective training academies for one year of training **before granting of** leading troops to victory in conventional and non-conventional conflicts.

commission: Army cadets go <u>Indian Military</u> <u>Academy</u> (IMA) at <u>Dehradun</u>, Air Force cadets to <u>Air</u> <u>Force (AFA) at Dundigal, Hyderabad, and **the N**aval cadets to <u>Indian Naval Academy</u> (INA), Ezhimala, Kerala.</u>

Entrance Examination's Question Paper contains Multiple Choice Questions where one question has four options out of which only one is a correct answer.

The question paper has two sections: Mathematics of 300 Marks and General Knowledge of 600 Marks. The time duration is 2 hours and 30 minutes for each paper.

The Mathematics syllabus is based on CBSE 10+2 standards. The General Knowledge section consists of topics in Physics of 100 marks, Chemistry of 60 marks, General Science of 40 marks, History and Freedom Movement of 80 marks, Geography of 80 marks, and Current Events of 40 marks.

For year 2019, NDA-1 is scheduled for April 21, 2019 and NDA-2 is scheduled for November 17, 2019. The examination will be conducted in offline mode (*pen and paper-based*).

The UPSC has fixed 41 examination centres across the country where examination will be conducted.

To know more about the NDA entrance examination, the aspirants should be in regular touch with the official website of UPSC: **upsc.gov.in**

The expected cut off for the NDA 2019 is to remain between 340-360 in written test, whereas overall cut off will be in the range of 700 - 720.

Author is editor of this e-Bulletin and an acclaimed author and teacher of mathematics

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JHARKHAND GOVERNMENT TOOL ROOM, RANCHI "Skilling India, Changing Lives"

A premier institute of Government of Jharkhand established and came into operation in the year 2007 with the support of Ministry of MSME, Govt. of India under the supervision of MECON. The institutes main objective is to impart various Skill Development training programmes for the youth of the state through its AICTE approved course of 4 years Diploma In Tool & Die Making equivalent to Diploma In Mechanical Engineering and various other courses in the field of Production and Manufacturing along with providing support to industries through its state of the art facilities specializing in CNC machining, designing and manufacturing of Jig, Fixtures, Cutting Tools, Gauges, Press tools, Forgings dies, Pressure casting dies and other tooling for small scale & other industries with Advanced tool making process using CAD/CAM techniques.



The institute is working under Department of Industries, Govt. of Jharkhand. The chairman of the centre is Secretary Industries and Vice Chairman is Director of Industries, Government of Jharkhand. The institute is being governed by a Governing Council having the members Director XLRI, Jamshedpur, V.C., BIT Mesra, Ranchi, Director NIFFT, Ranchi, CMD, CMPDI, Ranchi, Director Usha Martin Industries, Ranchi, Plant Head, Tata motors Jamshedpur, Director MSME-DI, Ranchi etc.

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- State of the art Inspection / Quality Control department equipped with Coordinate Measuring Machine, Hardness Testing Machine, Surface Hardness Tester and wide range of metrological Instruments.
- State of the art Refractory Material Testing Lab.
- State of the art CAD/CAM Lab facilities equipped with Latest Designing Software like Auto CAD, Pro Engineer, Catia V5R19, Delcam, Hyperworks, Staad Pro etc.
- Electrical & Electronics Lab equipped with PLC Hardware, Simulators, Sensors and Actuators. Programming of Variable Frequency Drive, Pneumatic kit along with
- Robotics Lab equipped with robotic 3D printing, laser engraving, stamping, Drawing and Pick and Place.

The institute has received the Times Impact Award for the 3rd most admired institute in Jharkhand awarded by the Times Group and the award for the Best use of Technology for Vocational Education & Skills Training, awarded by ASSOCHAM India. The students trained at our centre are recruited by renowned companies like Tata Motors Ltd, Tata Cummins, Timken India Ltd, Tata Hitachi, TRF ltd, Jindal Steel & Power Ltd, HEC Ranchi, Tata Growth shop, TML Drivelines, Caparo Engineering India Ltd, Metalsa etc.

This institute has aligned to Interactive Online Mentoring Sessions (IOMS) of Gyan Vigyan Sarita in Mathematics and Physics, starting with First Year students since January, 2019.

It can be reached at: Plot No:38, Tatisilwai Industrial Area, Tatisilwai, Ranchi-835103 Website:www.jgmsmetr.com, e-mail: info@jgmsmetr.com.

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वो वादी जो कभी जन्नत थी मणालिनी घळे

वो वादी जो कभी जन्नत थी कहलाती आज वहां खून की क्यों नदियाँ हैं बहतीं दहशतगर्दों ने ऐसी तबाही मचाई

सिपाहियों के संग खून की होली चराई

देश की ख़ातिर जान गंवाई कई वीरों ने

ख़ुद को न्योछावर कर दिया कई वीरों ने

उनका बलिदान लिखा जाएगा स्वर्णाक्षर में शौर्य गीत उनके गाये जायेंगे घर-घर में इस बार आहुति उनकी व्यर्थ नहीं हो पाए इस बार नहीं होगा उनके साथ अन्याय कृति से होगा निराकरण अब न सिर्फ काग़ज पर आशा नहीं विश्वास हमें हैअपने नेता पर। पथिक

डॉ. संगीता पाहुजा

ए पथिक सुन जरा पांव जमा कर रख,इस धरा पर जरा। इन पदचापों को ध्यान से सुन जरा। भटक ना जाएं,अपने लक्ष्य से ये कदा। ए पथिक सुन जरा।

क्यूं जन्म लिया इस धरा पर, इस बात पार विचार कर जरा। हो जाए जीवन सफल,जी कुछ इस तरह। ए पथिक सुन जरा।

जीवन आए किसी के काम, कर्म कर कुछ इस तरह। सीखने की लालसा ना हो कभी कम। बढ़ने की प्रेरणा मिलती रहे हर कदम, संगत मिले कुछ इस तरह। ए पथिक सून जरा।

राह में जो राहगीर मिलें,उनसे मिल कुछ इस तरह। कि मिसाल बन जाए तू चांद तारों की तरह। ए पथिक सुन जरा।।



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 प्रकाशितहै।

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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 आपकीविशेष रूचि है | संपर्क: मो. क्र.- 9953967901, ई-मेल: sangeeta.pahuja3@gmail.com

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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

http://www.gyanvigyansarita.in/

बिनती

ले. कर्नल (डॉ.) प्रमोद देवगिरीकर

थक गए हैं हाथ लाशें बीनते बीनते पक गये हैं कान ये बातें सुनते सुनते व्यर्थ नहीं जायेगी अब ये क़ुरबानी देंगे जवाब हम उन्ही की ज़बानी

वो देश जो दुनिया से मांग रहा भिक्षा उसीसे हम नहीं कर पाते हमारी रक्षा बस सुनते रहते हैं हम हर दिन राफेल राफेल जबकि कश्मीर की सरकारें हुयीं हैं फेल फेल

होते रहेंगे रोज़ चर्चे चौकीदार पर अच्छे दिन और सीने की चौड़ाई पर उस तुच्छ विधवा का किसे होगा विचार जिन्हे कैसे भी बनानी है अगली सरकार

ख़त्म होती रहेंगी क़ीमती जिंदगियाँ पर उठती रहेंगी एक-दूजे पर उँगलियाँ पैबन्द लगायेंगे उनके शब्द चुने हुये और चढ़ायेंगे शवों पर फूल चुने हुये

नहीं रहेगा यह हादसा भी उनके एजेंडे में झूल जायेंगे वो फिर चुनावों के हिंडोले में सारा ध्यान होगा 'बनेगी कैसे सरकार पर' होता रहेगा आम जनता पर प्रहार, पर

हम भारतीय हैं, लुटने की आदत है सभी जी भर लूटो, आपको दावत है मत दो हमें सन्मान, हरियाली, खुशहाली पर हमारा जीने का हक़ तो कर दो बहाली



कवि एक प्रबुद्ध, साहसी, परिपक्व एवं अनुभवी व्यक्ति हैं। सन 1972 B.E. (Mech) करने के पश्च्यात 73-74 भारतीय थल सेना में सेवा की। सन 84 में IIT खडगपुर से M.Tech, सन 94 में MBA तथा सन 2009 में Ph.D की। अनेक पराक्रमी कार्यों के साथ सन १987 से

1989 के दौरान 16 माह के लिए अंटार्टिका मिशन में सेना का प्रतिनिधित्व किया, जिसके लिए सेनाध्यक्ष द्वारा प्रशस्तिपत्र प्रदान किया। सेना में एवं ऐच्छिक निवृत्ति के पश्च्यात व्यावसायिक, शैक्षिक और लेखन के अनेक गतिविधयों को गौरवान्वित किया। वर्तमान लेखन तथा MBA के विद्यार्थियों का विश्वविद्यालय में मार्गदर्शन के कार्य में व्यस्त रहते हैं।

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मैं हूँ TOOL & DIE MAKER

Johan Mahto

करता हूँ मैं हर वो काम जो नहीं होता है आसान। चाहे करनी हो filing या करनी होmilling . चाहे करनी हो tuming या करनी हो grinding , चाहे करनी हो drilling या करनी हो designing , हर section में मैं fit बैठता हूँ, अपना 100% performance देता हूँ।।

मशीनों के साथ रहता हूँ l बहुत कुछ इनसे सीखता हूँ ll

हो गयी है इनसे दोस्ती गहरी | लगती है ये बड़ी प्यरी ||

चाहे आ जाए इनमें कोई problem । निकाल लेता हूँ मैं इनकाsolution ||

कभी नहीं थकता हूँ मैं, कभी नहीं रुकता हूँ मैं जी तोड़ के मेहनत करता हूँ मैं । हारने से नहीं डरता हूँ मैं।, ले के चला हूँ विश्वास ये मैं, Skilled बनाऊंगा इस देश को एक दिन मैं।।

किस्मत के भरोसे नहीं बैठा हूँ मैं। कुछ कर गुजरने की तमन्ना में हूँ मैं।। करने हैं पूरे मुझे अपने कुछ सपने। जो पाल रखे हैं मैंने दिल में।। बन गया हूँ मैंtool & die maker, दिखलाऊंगा दुनिया में मैं अपनी जौहर।।



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Poet is an alumnus, Batch-2013, of Diploma in Tool & Die Making from Jharkhand Government MSME Tool Room Ranchi. He is son of an agriculturist Shri Mahabir Mahto from Hesal Manjhila Toli, Angara, Ranchi, Jharkhand. He is currently

working as Technician at prestigious organization Defence Research and Development Organisation (DRDO), Government of India, Thiruvanantpuram.

| Students' Section | |
|--|---|
| माँ तू होती तो | श्रद्धांजलि |
| बिभाष कुमार | आकाश गुप्ता |
| नींद बहुत आती है,पढ़ते पढ़ते, | आसमान भी रोया था, धरती भी थराई थी, किसी को मालम ना था यारो |
| माँ अगर तू पास होती तो कहता, चाय बना दे। | किस घड़ी मौत यह आई थी! |
| थक गया हुँ यहाँ का खाना खा कर, | मां का एक टक चेहरा था, आंखों में बहते आंसू थे, पत्र थे उनके शहीद हुए |
| अगर तू पास होती तो कहता,पराठे बना दे। | जो मातृभूमि के नाते थे! |
| भींग गयी आसुओ से,आखें मेरी, | पत्नी का तिलछन्ना- चिल्लाना, सीने में तीर चूभाता था, एक गान सन्यम था उनका |
| अगर तू होती तो कहता,आंचल दे दे। | वह भारत मां का बेटा था! |
| देर रात हो जाती है ,यहाँ जागते जागते, | बेटे के सिर से हाथ गया, चलना वो जिन से सीखा था, चलेरें चन की अन सम्म |
| तू पास होती तो, शायद वक्त पर सो जाता। | कधा का मा अब राज गया, वह बैठ जहां जग देखा था! |
| रोज वही कोशिश खुश रहने की, | मां की सुनी गोद हुई, पत्नी का सिंदूर भी मिटा, |
| अगर तू पास होती तो, मुस्कुरा लेता। | पती के दिले में आहे उठी, पुत्र का हाथ भी छूट गया! |
| सुना है कई दिनो से तू भी नही मुस्कुराई, | गर्व है इन परिवारों को, अपनी उन संतानों पर, |
| अगर सपने नहीं होते,तो घर लौट आता। | मातृभूमि के लिए समापत, हुए वीर बलिदानों पर! |
| बहुत दूर निकल आया हूँ घर से तुम्हारे, | नेताओं क्यों बैठे हो, बदला लो गद्दारों से, |
| अगर तेरे सपनो की परवाह नहीं होती, | अगर खून म गम बाका ह, सर बिछा दो तुम तलवारों से! |
| तो घर लौट आता, माँ अगर तू पास होती तो। | बदला ले इस वार का तुम, उन वीरों का सम्मान रखो, माता पिता और पुत्र के सर, |



कवी JGMSME Tool Room के चार वर्षीय DTDM कार्यक्रम के प्रथम वर्ष का छात्र है। वह इस प्रयोजन के IOMS कार्यक्रम से लाभान्वित है

ई-मेल: bibhash879779527@gmail.com

कवी JGMSME Tool Room) के चार वर्षीय DTDM कार्यक्रम के प्रथम वर्ष का छात्र है। वह इस प्रयोजन के IOMS कार्यक्रम से लाभान्वित है e-Mail ID: akashkmr703@gmail.com

मातृभूमि का ताज रखो!!!!!

CONCENTRATION

Chandi

Concentration is nothing but keeping our mind in our control. It is an important factor for mankind, without concentration we cannot do anything properly. Concentration is a must in every



field. Concentration is the main tool of success.

Likewise in student life also concentration is needed to complete our education in a great way. there are 6 tips to be followed by a student while his studying to increase his concentration and make him excel in his studies are as under -

1. Preparing time table is must for a student. So that the student have a plan what to study

2. The student should take one particular topic or subject at a time and he should not do any other work in the time. So that it will help to improve his academic knowledge and his concentration power.

3. Before student is going to study he should inform to his parents that they do not call him for that time he has fixed to study.

4. The main problem for a student to study is unnecessary sounds in his surroundings. It causes a big interruption for students. To overcome this problem the students should leave that place or if he does not have place to study he should think about good things and his goal.

5. While he is studying he should not shake his hands or other body parts unnecessarily, it may divert his mind to other things.

6. Meditate well for relaxing before you are going to study.



If the students follow the above mentioned tips he could definitely get success.

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Circle Art by **M. Pavan Kumar**, Class 7th, Ramkrishna Mission High School, Sitanagram E-mail: <u>rkmvschool@gmail.com</u>

<u>An Essay</u>: How will the increasing energy, influence the International Peace, Cooperation and Security?

B. Bhagyasrilakshmi

Everyday we have to do many activities to fulfill our needs. For doing activities we need energy. So we have to increase our energy sources. The main source of energy is sun. Energy converts from one form to another form such that total energy remains constant, this is called "conservation of energy".

The conservation energy is also helpful to meet our needs, by way of efficient uses, which in turn reduce strains caused by gap in availability and demand of energy. Thus influences the international peace, cooperation and security. In our daily life we can see many farms of energy like solar energy, hydro energy, electrical energy, wind energy, tidal energy and so on. We are converting the potential energy into electrical energy in hydroelectric plants. We are keeping turbines where the flow of water is suitable to produce electricity. We are converting the energy showered by the sun into solar energy to save the electricity. When we chargeing phone electrical energy is converted into chemical energy which is again convertsed into electrical energy. Generally while lifting the box our muscular energy is

Some countries like North Korea have nuclear bombs with them. The nuclear bombs are very dangerous to the world. If the nuclear energy is converted into electrical energy or other forms of energies, the world will be very peaceful and secure. And some more situations taking place in day to day activities are – in electric fan where the electrical energy is converting into mechanical energy. In dynamo the mechanical energy is converting into electrical energy.

In the same way solar energy, wind energy, tidal energy and other forms of energies are converted into electrical energy to control the pollution by reducing consumption of fossil fuels. This can be is done only with the co-operation of all countries.

And finally I conclude that the conservation of energy influences international peace, co-operation and security as there is the increasing energy needs in our day to day life.

"PLEASE USE ENERGY SOURCES CAREFULLY AND CONSERVE IT"



converted into potential energy.

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"If people are good only because they fear punishment, and hope for reward, then we are a sorry lot indeed."

~Albert Einstein

VIDEO GAMES

A game played by electronically manipulating images produced by a computer program on a monitor or other display are called video games.

Now- a- days video games are common readily available to children . There are no doubts that video games control children in both physical and mental ways. For their commercial growth some



companies are releasing violent video games. These games bring some changes in children and cause them physical and psychological problems.

The issue is whether these violent video games are constructive or destructive to the younger generations, especially teenagers getting affected.

Let us consider some advantages and disadvantages of playing video games and violent video games.

Advantages:

- 1. Playing some games like puzzles, chess, quiz games related are good for children brain development.
- 2. These games also decreases stress and also give good relaxation to children.

"Out door games are very better than video games "

Bala Venkata Swaroop

3. These games will help in their studies as well.

Disadvantages:

- 1. It will causes eye problems.
- 2. When we get addict to these games, we will waste 8 to 10 hours in a day .
- Parents should guide their kid in his choice of games. Violent games teach violent behavior. So they should encourage him to buy/rent sports, puzzle, maze, or adventure games rather than the violent ones



- 3. We will not be able to concentrate on our studies or other any work.
- 4. Playing violent video games is a significant risk factor for students physical aggression.
- 5 .These video games also affect family relations.

So, I request everyone to avoid violent video games such as Blue Whale and other games which are very danger. Because games creating many incidents which causes many death .One more time I can tell they can control us. Play out door games and get good physical body. Its makes you healthy. Every thing is in our hands. Make a which is good .



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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.

During growing into an expert, 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) <u>Mathematics</u>, b) <u>Physics</u>, and c) <u>Chemistry</u>. 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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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

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Take care of your thoughts, For they are formed and moulded by our thoughts. Those whose minds are shaped by selfless thoughts, Give jot when they speak or act. Joy follows them like a shad, that never leaves them.

- Gautama Buddha

Answers: Science Quiz- February'19

Kumud Bala

- 1. (c)- Under anaerobic condition, yeast respires and converts glucose into alcohol and CO₂
- 2. (b)- This is because rapid aerobic respiration occurs during vigorous exercise in order to obtain more energy.
- 3. (a)- When a person breathes deeply the external intercostals muscles contract causing the rib cage to swing up and out. Also, the diaphragm contracts and flattens causing the thoracic cavity to increase in volume and decrease in pressure.
- 4. (c)- The gas is oxygen as atmospheric air has approximately 21% of O_2 .
- 5. (d)- Sensory neuron transmits impulses towards CNS (i.e. brain and spinal cord) while, the relay neurons occur within the CNS and serve as links between other neurons.
- 6. (b)- The sequence of events in a typical nerve pathway is receptor→ passage of impulse along sensory neuron→passage of impulse along motor neuron→ activation of muscle (effectors). Thus, the correct sequence is (ii), (iv), (iii), (i)
- 7. (d)- Organisms divide into many daughter cells simultaneously, e.g., Plasmodium
- 8. (c)- In sexual reproduction the offsprings are not exactly identical to the parents or to one another. This is because the offsprings receive some genes from mother and some from father. Because of mixing of genes on re-establishment of the exact number of chromosomes as in the parents, the offsprings show both similarities and variations with their parents.
- 9. (a)-Amoeba and yeast are unicellular while spirogyra is multicellular. But the all three reproduce asexually.
- 10. (b)- The flowers which are unisexual (Papaya, water-melon) contain either stamens or carpel. Since, only one reproductive organ is present in them, they depend on cross-pollination to form zygote after fertilization. Both stamens and carpel are required for fertilization, so only one of them cannot produce fruits.
- 11. (c)- Sexual reproduction creates variation in organisms, so clones cannot be produced through it. Clones are identical copy of parent organism. Sexual reproduction needs two types of gametes, i.e. male and female to form zygote after fertilization.
- 12. (c)- Under favorable conditions (like damp and warm conditions, availability of nutrients), the fungal spores present in the air, lands on food, germinate and produce new plants.
- (a)- Formation of gametes→ fission of gametes to form zygote→ zygote develops into embryo in the ovary→ovule develops a tough coat and converts into a seed.
- 14. (a)- Offsprings have greater similarity as only one parent is involved in asexual reproduction, thus, no gametes are formed.
- 15. (c)- Since, flower A bears only stamen, i.e. male reproductive part so, it cannot get fertilized. And flower B bears both male and female reproductive parts; therefore, it can get fertilized by pollination and can change into fruit.
- 16. (c)- In polluted water sample, coli form bacteria are present. High BOD indicates that water is polluted. Coli form bacteria occurs in water bodies where human excreta and dead-bodies are disposed off.
- 17. (d)
- 18. (d)
- 19. (c)- Bhundhis and Khadins are the traditional rain harvesting system used in Rajasthan, Madhya Pradesh and Uttar Pradesh respectively.

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ANSWER: CROSSWORD PUZZLE February'19: EXAMINATION

Prof. S.B. Dhar



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Growing With Concepts - Mathematics

LET'S DO SOME PROBLEMS IN MATHEMATICS-VII (Focus-NDA)

Prof. SB Dhar

This article relates to the problems of *The National Defence Academy (NDA)* entrance examination. The purpose of selecting these problems is to keep the readers aware of the standard and the type of questions that are asked in the NDA entrance examination. The detail solutions, if any reader wants, can be provided when they write one-to-one to the coordinator.

In Mathematics Paper there are 120 Questions of Total 300 Marks. For each wrong answer one third marks are deducted. Some questions to understand the difficulty level are selected here. The correct answer follows the question in *italics*.

Paper 1: Mathematics

- If n∈N, then 121ⁿ 25ⁿ + 1900ⁿ (-4)ⁿ is divisible by which of the following?
 (a) 1904
 (b) 2000
 (c) 2002
 (d) 2006
 Ans.(a)
- 2. If n = (2017)!, then what is $\frac{1}{\log_4 n} + \dots \dots \frac{1}{\log_{2017} n}$ equal to? (a) 0 (b) 1 (c) $\frac{1}{2}$ (d) n *Ans.(b)*
- 3. Let α and β be real numbers and z be a complex number. If z² + αz + β = 0 has two distinct non-real roots with Re (z) = 1, then it is necessary that (a) β∈(-1,0) (b) | β| = 1 (c) β∈(1,∞) (d) β∈(0,1) Ans.(a)
- 4. How many four-digit numbers divisible by 10 can be formed using 1,5,0,6,7 without repetition of digits?
 (a) 24 (b)36
 (c) 44 (d) 64
 Ans.(b)

Consider the information given below and answer the *Qn* no. 5 and 6 that follow:

In a class, 54 students are good in Hindi only, 63 students are good in Mathematics only and 41 students are good in English only. There are 18 students who are good in both Hindi and Mathematics. 10 students are good in all three subjects.

 What is the number of students who are good in either Hindi or Mathematics but not in English? (a)99 (b)107

| (c)125 | (d)130 |
|---------|--------|
| Ans.(c) | |

- 6. What is the number of students who are good in Hindi and Mathematics but no in English?
 (a)18 (b)12
 (c)10 (d)8
 Ans.(a)
- 7. The equation has |1 x| + x² = 5
 (a) A rational root and an irrational root
 (b) Two rational roots
 (c) Two irrational roots
 (d) No real roots
 Ans.(c)
- 8. The binary number expression of the decimal number 31 is
 (a)1111 (b)10111

| (c)11011 | (d)11111 |
|----------|----------|
| Ans.(b) | |

- 9. If A is a 2×3 matrix and AB is a 2×5 matrix, then B must be a

 (a)3×5 matrix
 (b)5×3 matrix
 (c)3×2 matrix
 (d)5×2 matrix

 Ans.(c)
- 10. What is the number of triangles that can be formed by choosing the vertices from a set of 12 points in a plane, seven of which lie on the same straight line?
 (a)185 (b)175
 (c)115 (d)105
 Ans.(a)
- 11. What is $\sin 105^0 + \cos 105^0$ equal to?

| (a) \$1150 | $(0)\cos 30$ |
|--------------------------|--------------|
| (b) $\frac{1}{\sqrt{2}}$ | (d) 0 |

(c) Ans.(a)

- 12. If x, x-y and x+y are the angles of a triangle (not an equilateral triangle) such that tan(x-y), tanx and tan(x+y) are in G, then what is x equal to? (a) $\frac{\pi}{4}$ (b) $\frac{\pi}{3}$ (c) $\frac{\pi}{6}$ (d) $\frac{\pi}{2}$ Ans.(a)
- 13. ABC is a triangle inscribed in a circle with centre O. let $\alpha = \angle BAC$, where $45^0 < \alpha < 90^0$. Let $\beta = \angle BOC$. Which one of the following is correct? (a) $cos\beta = \frac{1-tan^2\alpha}{1+tan^2\alpha}$ (b) $cos\beta = \frac{1+tan^2\alpha}{1-tan^2\alpha}$ (c) $cos\beta = \frac{2tan\alpha}{1+tan^2\alpha}$ (d) $sin\beta = 2sin^2\alpha$ *Ans.(b)*

14. What is
$$tan^{-1}\frac{1}{4} + tan^{-1}\frac{3}{5}$$
 equal to?
(a) 0 (b) $\frac{\pi}{4}$
(b) $\frac{\pi}{3}$ (d) $\frac{\pi}{2}$
Ans.(b)

- 15. What is the distance between the points which divide the line segment joining (4,3) and (5,7) internally and externally in the ratio 2: 3?
 - (a) $\frac{12\sqrt{17}}{5}$ (b) $\frac{13\sqrt{17}}{5}$ (c) $\frac{\sqrt{17}}{5}$ (d) $\frac{6\sqrt{17}}{5}$ *Ans.(c)*
- 16. What is the angle between the straight lines $(m^2 mn)y = (mn + n^2)x + n^3$ and $(mn + m^2)y = (mn n^2)x + m^3$, where $m \ge n$?

(a) $tan^{-1}\left(\frac{2mn}{m^2+n^2}\right)$ (b) $tan^{-1}\left(\frac{4m^2n^2}{m^4-n^4}\right)$ (c) $tan^{-1}\left(\frac{4m^2n^2}{m^4+n^4}\right)$ (d) 45^0 *Ans.(d)*

- 17. Consider the following statements:
 - (i) The length p of the perpendicular from the origin to the line ax+by=c satisfies the relation $p^2 = \frac{4c^2}{a^2+b^2}$
 - (ii) The length p of the perpendicular from the origin to the line $\frac{x}{a} + \frac{y}{b} = 1$ satisfies the relation $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$.

(iii) The length p of the perpendicular from the origin to the line y=mx+c satisfies the relation $\frac{1}{p^2} = \frac{1+m^2+c^2}{c^2}$

Which of the above is/are correct?

- (a) i, ii, and iii (b) i only
- (c) i and ii only
- (d) ii only

Ans.(b)

- 18. The coordinates of the vertices P, Q, and R of $\triangle PQR$ are (1,-1,1), (3,-2,2) and (0,2,6) respectively. If $\angle RQP=\theta$, then what is $\angle PRQ$ equal to? (a)30⁰+ θ (b)45⁰- θ (c)60⁰- θ (d)90⁰- θ *Ans.(d)*
- 19. What is the moment about the point î + 2ĵ kôf a force represented by 3î + k acting through the point 2î ĵ + 3k?
 (a) -3 î + 11ĵ + 9k
 (b) 3î + 2ĵ + 9k
 (c) 3 î + 4ĵ + 9k
 (d) î + ĵ + k
 Ans.(d)
- 20. Which one of the following is correct in respect of the function f: R → R⁺defined as (x) = |x + 1| ?
 (a) f(x²)=[f(x)]²
 (b) f(/x/)=/f(x)/
 (c) f(x+y)=f(x)+f(y)
 (d) None of the above Ans.(a)
- 21. What is the area of the region bounded by the parabolas $y^2 = 6(x-1)$ and $y^2 = 3x$?

(a)
$$\frac{5\sqrt{6}}{3}$$
 (b) $\frac{\sqrt{6}}{3}$
(c) $\frac{4\sqrt{6}}{3}$ (d) $\frac{5\sqrt{6}}{3}$
Ans.(b)

- 22. What is $\int_0^{\pi} e^x \sin x \, dx$ equal to? (a) $\frac{e^{\pi} + 1}{2}$ (b) $\frac{e^{\pi} - 1}{2}$ (c) $e^{\pi} + 1$ (d) $\frac{e^{\pi} + 1}{4}$ Ans.(a)
- 23. What is the solution of the differential equation xdy-ydx=0?

(a)
$$xy=c$$
 (b) $y=cx$
(b) (c) $x+y=c$ (d) $x-y=c$
Ans.(a)

24. What is the derivative of the function $e^{tanx} + \ln(secx) - e^{lnx}$ at $x = \frac{\pi}{2}$?

(a)
$$\frac{e}{2}$$
 (b) e
(c) $2e$ (d) $4e$
Ans.(b)

- 25. What is $\int_0^1 x(1-x)^9 dx$ equal to? (a) $\frac{1}{110}$ (b) $\frac{1}{132}$ (c) $\frac{1}{148}$ (d) $\frac{1}{240}$ Ans.(a)
- 26. What is $\lim_{x\to 0} \frac{\tan x}{\sin 2x}$ equal to ? (a) $\frac{1}{2}$ (b) 1 (c) 2 (d) Limit does not exist Ans.(b)
- 27. If f(x) is an even function, where $f(x) \neq 0$, then which one of the following is correct?
 - (a) f'(x) is an even function
 - (b) f'(x) is an odd function
 - (c) f'(x) may be an even or odd function depending on the type of function
 - (d) f'(x) is a constant function
 - (e) Ans.(a)
- 28. In a binomial distribution, the mean is three times its variance. What is the probability of exactly 3

| successes | out | of | 5 | trials? |
|---------------------|-------------------|----|---|---------|
| $(a) \frac{80}{3}$ | (b) $\frac{4}{3}$ | 0 | | |
| 243 | (0) 24 | 13 | | |
| $(c)\frac{20}{242}$ | $(d) \frac{1}{2}$ | 12 | | |
| Ans.(b) | 22 | 13 | | |

29. Consider the following statements:

- 1. The sum of deviations from mean is always zero.
- 2. The sum of absolute deviations is minimum when around median.

Which of the above statements is/are correct? (a) 1 only (b)2only

(c) both 1 and 2 (d) neither 1 nor 2

Ans.(b)

- 30. A train covers the first 5 km of its journey at a speed of 30 km/h and the next 15km at a speed of 45 km/h. what is the average speed of the train? (a)35km/h (b)37.5km/h (c)39.5km/h (d)40km/h Ans.(a)
- 31. One bag contains 3 white and 2 black balls, another bag contains 5 white and 3 black balls. If a bag is chosen at random and a ball is drawn from it, what is the chance that it is white? (a) $\frac{3}{8}$ (b) $\frac{49}{80}$ (c) $\frac{8}{13}$ (d) $\frac{1}{2}$
 - Ans. (a)

The <u>second paper</u> is to test the General Ability of the aspirants. In this paper there are 150 questions. Each Question carries 4 marks for correct answer and One third is deducted for each wrong answer.

Second Paper: General Ability

- Select the option that is nearest in meaning to the **underlined** word/words.
- 1. I do not want you to lead a life of *sycophancy* as you did during the foreign rule.
 - (a) Admiration
 - (b) Love
 - (c) Appreciation
 - (d) Flattery Ans.(d)

Select the option that is opposite in meaning to the <u>underlined</u> word/words.

The company was <u>liquidated</u> within five years.
 (a) Bankrupt

- (b) Closed down
- (c) Flourishing
- (d) Privatized
- Ans.(c)

The sentence is underlined in three parts (a), (b) and (c). Read the sentence to find out whether there is any error in the underlined part. If you find no error, your response should be indicated as (d)

3. (a)<u>The owner</u> (c) <u>is honest</u>. (b) <u>as well as his servants</u> (d) <u>No error</u> *Ans.(c)* Given below is idiom/phrase followed by four options. Choose the correct option.

4. Cut the mustard

(a)Prepare spices out of mustard seeds(b) To come up to expectations(c) making absurd expectations(d) Very enthusiastic

Ans.(c)

Following are given six sentences of a passage. The first and sixth sentences are given in the beginning as S1 and S6. The middle four sentences have been jumbled up and labeled P,Q, R, S. You are required to find the proper sequence of the four sentences and mark your response accordingly.

5. S1: A mighty popular Revolt broke out in Northern and Central India in 1857.

S6: Millions of peasants, artisans and soldiers fought heroically and wrote a glorious chapter.

- P: Sepoys, or the Indian soldiers of the Company's army
- Q: but soon engulfed wide regions and involved the masses
- R: and nearly swept away the British rule
- S: It began with a mutiny of the

The proper sequence should be

| (a) RSPQ | (b)PQRS |
|----------|---------|
| (c) SPQR | (d)QRPS |

- Ans.(c)
- 6. Which one of the following statements is correct?
 (a) Any energy transfer that does not involve temperature difference in some way is not heat.
 (b) Any energy transfer always requires a temperature difference

(c) On heating the length and volume of the object remain exactly the same

(d) Whenever there is a temperature difference, heat is the only way of energy transfer. Ans.(d)

- 7. Which one of the following is the value of 1kWh of energy converted into joules?
 - (a) $1.8 \times 10^6 \text{J}$
 - (b) $3.6 \times 10^6 \text{J}$
 - (c) $6.0 \times 10^6 \text{J}$
 - (d) 7.2×10^6 J

Ans.(c)

- 8. Which of the following properties is true for a tooth paste?
 - (a) It is acidic
 (b) It is neutral
 (c) It is basic
 (d) It is made up of Calcium phosphate, the material of tooth enamel
 Ans.(d)
- AIDS is caused by a virus whose genetic material is

 (a) Single stranded circular DNA
 - (b) Double stranded DNA
 - (c) Single stranded RNA
 - (d) Double stranded RNA
 - Ans.(c)
- 10. Which one of the following statements about meristematic tissues in plants is correct?
 (a) These are dead tissues and form wood
 (b) They provide flexibility to plant due to their thickened walls
 (c) These are present in the bark of a tree only
 (d) Growth occurs in plants due to division of cells of these tissues
 Ans.(b)
- 11. Consider the following statement about Roaring Forties:
 - 1. They are strong Western winds found in the oceans of Southern Hemisphere.
 - 2. The strong east to west air currents are caused by the combination of air being displaced from the Equator towards the South Pole and the earth's rotation and abundance of landmasses to serve as wind breaks.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Ans.(b)

- 12. A ball balanced on a vertical rod is an example of
 - (a) Stable equilibrium
 - (b) Unstable equilibrium
 - (c) Neutral equilibrium
 - (d) Perfect equilibrium

Ans.(b)

- 13. Which one of the following is the purest form of Carbon?
 - (a) Charcoal
 (b) Coke
 (c) Fullerene
 (d) Carbon black
 Ans.(a)
- 14. If by an unknown accident the acid secreting cells of the stomach wall of an individual are damaged, digestion of which one of the following biomolecule will be affected to a greater extent?
 - (a) Protein only
 (b)Lipid
 (c)Carbohydrate only
 (d) Protein and Carbohydrate *Ans.(d)*
- 15. Which one of the following statements about magnetic field lines is NOT correct?
 - (a) They can emanate from a point
 (b) They do not cross each other
 (c) Field lines between two poles cannot be precisely straight lines at the ends
 (d) There are no field lines within a bar magnet *Ans.(c)*
- 16. Which one the following rivers is not a tributary of river Cauvery?

(a)Hemavati (b)Arkavati (c)Indravati (d)Amravati Ans.(a)

- 17. Which of the following clans are included in the Agnikula Rajputs?
 - (a) Pratiharas
 - (b) Chaulukyas
 - (c) Paramaras
 - (d) Chahamanas

Select the correct answer from the code given below:



Dr S.B. Dhar, is **Editor of this Quartrerly 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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- (a) 1 and 3 only
- (b) 1,3 and 4 only
- (c) 1,2,3 and 4
- (d) 2 and 4 only
- Ans.(d)
- 18. Which of the following povision(s) of the constitution of India became effective from26th November 1949?1. Elections
 - 2. Citizenship
 - 3. Emergency provisions
 - 4. Appointment of the Judges

Select the correct answer using the code given below:

- (a) 1 only
- (b) 1 and 2 only
- (c)1,2 and 3
- (d) 2 and 4
- Ans.(a)
- 19. Which one of the following countries did not participate in the 21st edition of Exercise Malabar?
 (a)United States of America
 (b) Japan
 (c)India
 (d) Australia
 - Ans.(c)
- 20. In order to review the Income Tax Act, 1961 and to draft a new Direct Tax Law in consonance with economic needs of the county, the Government of India in November 2017 has constituted a Task Force. Who among the following is made the convenor of it?

 (a) Shri Arvind Subramanian
 (b) Shri Arbind Modi
 - (b) Shri Ardina Modi
 - (c) Shri Amitabh Knat(d) Dr. Bibek Debroy
 - (a) Dr. Bibei
 - Ans. (a)

CROSSWORD PUZZLE February'19 : INVENTIONS AND INVENTORS Prof. SB Dhar



Across

- 2 Surgeon who first used Ether anesthesia
- 7 Inventor of first Motorcycle
- 9 Father of Modern Plastic Surgery
- 10 Discoverer of Fire Extinguisher
- 11 Astronaut who plotted Moon's orbit

Down

- 1 Father of Nuclear Physics
- 3 First black woman to get Medical degree
- 4 Founder of Red Cross
- 5 Inventor of pH Tests
- 6 Inventor of First working Telephone
- 8 First woman dentist of USA

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

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There are two educations. One should teach us how to make a living, and the other how to live.

- John Adams

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Growing with Concepts : Physics

Mechanics Foundation of Physics

Physics is one of the most primitive sciences, and finds its application in explaining various phenomenon and process in other branches of physical and social sciences. The growth of physics started observations. with Among has phenomenon occurring in nature motion and displacement is directly visible; this is the starting point of physics. It is the understanding of mechanics which led to discovering other branches of physics.

In this educational initiative emphasis is on observing, correlating and visualizing various natural phenomenon and taking forward the understanding achieved into problem solving that are SO encountered. As the journey this proceeds. becomes intuitive. understanding Taking this approach an involvement into mentoring of unprivileged students started in chalk-n-talk mode. These students with practically no resources around had to depend for learning on observations around them. Moreover, this initiative driven with Personal Social Responsibility (PSR) had only one immaterial resource called inspiration. This inspired a small group of compassionate persons to share their learning experiences and join hands on the initiative.

Educational needs being so large that individually non can fulfill the requirement. Accordingly, it got shaped into Interactive Online Mentoring Sessions (IOMS) where mentors could reach cluster of students where internet connectivity is available. It involves local teachers as coordinators. In a constrained environment method of illustration of mathematics and science had to be indigenous, yet its access could not be limited to reach of mentors in this initiative. Thus evolved a need a of Mentors' Manual. Mentors in this initiative shared responsibility, one each, to develop manual on Mathematics, Physics and Chemistry as a free web resource.

Manuals on Mathematics, Physics have been completed, while for Chemistry, it is progressing. It is preceded with a Common Section which addresses basic mathematics and foundation mathematics a pre-requisite for taking advantage of this effort. Chapters on three subjects were progressively included as articles in monthly e-Bulletin in column "Growing with Concepts". All these articles are being progressively included in the e-Bulletin.

This being a herculean job, effort was to first encompass illustrations of course requirement upto class 12th being targeted in this initiative. This is now being progressed with question bank on each chapter. It is almost akin to writing a comprehensive book for PCM students. In the process conceptualizing contents, writing, word-processing and drafting figures and self-checking, must have left some inadvertent errors. In view of this we have undertaken a review of chapters. Having completed question bank on Mechanics part of Physics, chapters of manual related to this topic have been reviewed and are being uploaded. These Chapters are –

- Chapter oo: Physics A subject Not To Learn; it emphasizes upon observation, units, measurements, dimensions, errors and approximation.
- Chapter 01: Mechanics –

Prologue- Why Mechanics?: It emphasizes on relevance of mechanics in pursuit of Physics.

Part I- Kinematics: It dwells in position of a particle, displacement, motion and acceleration, without cognizance to the force, the cause of motion.

Part III- Newton's Laws of Motion: It takes into dynamics of particle

Part IV – Rigid Body Dynamics: It extrapolates dynamics of particles into rigid bodies.

Part V – Fluid Mechanics: In this mechanics of liquids, which are incompressible like solids has been elaborate. As regards Gases, it is included in Thermodynamics.

This manual is non-proprietary and open to all for use the way deemed fit be it copy, add, modify, change or delete. The only request is to please collectively complement for value addition, if possible, the way you can. It could be suggestion for improvements, mentor in IOMS or connect the initiative to passionately inspired persons to contribute in democratization of educations by way of grooming among target students a competence to compete. The gap between such mentors and students is so large that whatever little is done is bound to spiral out; it does not need any expert or a miraculous person to do it. All that is needed is taking a first step towards it with a sense of PSR.

Illustration of solutions to Two problems on mechanics of rigid bodies from NCERT Book follows this. It might be able to convey the emphasis on conceptual clarity in this Manual and choice of problems in Question Bank and their illustrations.

Typical Questions on Mechanics Physics Part I: Textbook for Class XI, NCERT (Chapter 7: Systems of Particles and Rotational Motion)

Here solution is being deliberately called illustration. There could be multiple ways of solving problem, and solution provider chooses one of them, with a presumption that its user has prior knowledge on selection of a particular way leading to the solution. Experience of mentoring unprivileged students has revealed that whatever and whichever way is told to the target students, they tend to remember it. This jeopardizes basic philosophy of reasoning in an out of box manner. Therefore, in illustrations below reasoning of the choice of concept, equations and their solutions is advanced from the basics. Every-time taking illustration of basic concepts from first principle is not feasible. However, a reader who has read the Mentors' Manual or a textbook would find it easy to sail into the reasoning behind a solution. Same method is adopted in illustrations of question bank, with a belief that mentor and students in isolated locations might find it easy to evolve methodology of problem solving in an intuitive manner, without either carrying burden of formulae or end results or take shortest route to solve a problem under examination conditions.

Q. No. 7.8: A non uniform bar of weight W is suspended at rest by two strings of negligible weight as shown in figure. The angles made by the straight strings with the vertical are 36.0° and 53.1° respectively.

The bar is 2 m long. Calculate the distance d of the centre of gravity of the bar from left hand.

[Ans.: 72 cm]

Illustration: In this question there are three unknown T_1, T_2 and d and that bar is in a state in the equilibrium. Therefore it is essential to form three equations to determine on or all the

variables. Solving such a problem requires to determine degrees of freedom (DF) which are three: (a) DF1-Vertical motion of the bar due to forces along vertical direction i.e. \hat{y} , (b) DF2- Vertical motion of the bar due to forces along vertical direction i.e. \hat{x} and (c) DF3- Rotational motion the bar is due to torques of forces acting on it along \hat{z} . Each of DFs are in direction perpendicular to each other and hence they are independent. Accordingly, equations along the three DFs shall lead to the solution and is as under



$$T_{1\nu} + T_{2\nu} - W = 0 \rightarrow T_1 \cos \alpha + T_2 \cos \beta = W - --- (1)$$

DF2: This requires resolution of T_1 and T_2 in horizontal direction which are $T_{1h} = T_1 \sin \alpha$ along $(-)\hat{x}$ and $T_{2h} = T_1 \sin \beta$ along \hat{x} . Since, bar stays in horizontal equilibrium position for which necessary condition is –

$$T_{1h} + T_{2h} = 0 \rightarrow -T_1 \sin \alpha \hat{x} + T_2 \sin \beta \hat{x} = 0 \rightarrow T_1 \sin \alpha = T_2 \sin \beta \quad ---- \quad (2)$$





DF3: This being rotational requires computation of torques which can be about any point on the bar. Since, all forces and distances are in the same plane, hence torque shall be along \hat{z} . Taking different points of rotation would create different equation, yet they are concurrent linear equation and therefore they would not help in solution. Therefore taking any point can be taken for equation in this DF, say it is A. Torque of three forces are (a) Torque due to T_1 is $\vec{\tau}_1 = 0$ since it is passing through A, (b) Torque due to $W\hat{z}$ is $\hat{\tau}_2 = \vec{d} \times (-W\hat{y}) = -d \cdot W \sin 90^0 \hat{z} = -d \cdot W\hat{z}$, (c) Torque due to T_2 is $\hat{\tau}_3 = \vec{l} \times \vec{T}_2$ From diagram this can be taken as $\hat{\tau}_3 = \vec{l} \times (T_2 \cos \beta) \hat{y}$ or $\hat{\tau}_3 = l \cdot T_2 \sin(90^0 - \beta) \hat{z}$, yet it leads to same result $\hat{\tau}_3 = l \cdot T_2 \cos \beta \hat{z}$. Thus for rotational equilibrium necessary condition is, $i\vec{\tau}_1 + \vec{\tau}_2 + \vec{\tau}_3 = 0 \rightarrow 0 - d \cdot W\hat{z} + l \cdot T_2 \cos \beta \hat{z} = 0$, it leads to $d \cdot W = l \cdot T_2 \cos \beta - (3)$ Now typically for angle $\alpha = 36.9^0$, $\cos \alpha = 0.8$ and $\sin \alpha = 0.6$, likewise $\beta = 53.1^0$, $\cos \beta = 0.8$ and $\sin \beta = 0.6$, and l = 2 m. Substituting these values in the above three equation they are solved. Eqn (2) leads to $0.6T_1 = 0.8T_2$, thus, $T_1 = \frac{4}{3}T_2 - (4)$. From Eqn (1) $0.8 \times \frac{4}{3}T_2 + 0.6T_2 = W \rightarrow 1.6T_2 + 0.6T_2 = W \rightarrow 2.2T_2 = W - (5)$. Now substituting W from Eqn (5) in Eqn(3), $d \times 2.2 \times T_2 = 2 \times T_2 \times 0.8 \rightarrow 2.2d = 1.6$, thus $d = \frac{1.6}{2.2} \approx 0.72$, *Answer*.

- **Q. No 7.21:** A solid cylinder rolls up an inclined plane of angle of inclination 30° . At the bottom of the inclined plane the centre of mass the cylinder has a speed of 5 m/s.
 - (a) How far will the cylinder go up the plane?
 - (b) How long will it take to return to the bottom?
- [*Ans.*: (a) 3.75 m, (b) 3.0 s]
- **Illustration:** This question is based on rolling action which stipulates relative velocity of particle at the point of contact with the sold surface is zero. It leads to a relation translational and angular velocity $v = r\omega$ and translational and angular acceleration $a = r\alpha$ This is based on the consideration that during rolling frictional force is conservative.

In this problem there are two situations – (a) cylinder rolling up till its linear velocity of centre of mass becomes Zero, and (b) cylinder starts rolling down after (a); this is attributed to downward pull effective on the cylinder. Each of the situations is analyzed from the perspective of forces on the cylinder.

Situation (a):

There are two approaches to solve this problem. One is based on conservation of energy (COE Approach) and other is based on dynamics (DYM Approach).

COM Approach: Total Energy of the cylinder at the bottom must be equal to that when ir reaches top at height *h* above the bottom i.e. $KE_B + PE_B = KE_T + PE_T \rightarrow KE_B - KE_T = PE_T - PE_B$. Since KE at the top is

zero, and KE at the bottom comprises its translational component
$$\left(\frac{1}{2}mv^2\right)$$
 and rotational component

$$\left(\frac{1}{2}I\omega^2 = \frac{1}{2} \times \frac{mr^2}{2} \times \omega^2 = \frac{1}{4}mV^2\right)$$
 and $\Delta PE = mgh$, therefore energy balance equation shall be

$$\frac{1}{2}mV^2 + \frac{1}{4}mV^2 = mgh \rightarrow \frac{3}{4}V^2 = gh \rightarrow h = \frac{3 \times 25}{40} = \frac{15}{8}$$
, taking g to be 10 m.s⁻². Further, with the given value

of θ , ascend of cylinder along the slope will be $=\frac{h}{\sin 30^0} = 2h = 2 \times \frac{15}{8} = 3.75$ m. This answer however depends upon value of g taken, unless it is specified in the problem.

DYM Approach: It requires determination of translational acceleration based on forces acting on the cylinder responsible for its motion along the plane. Net force on the cylinder $F = ma = mg \sin \theta - f$. Here, fis (-)ve since at point of contact particle of cylinder tends to move clockwise and frictional force would tend to oppose it. Further, taking rotational motion, $\tau = rf = I\alpha$, here $f = \mu mg \cos \theta$, it leads to

$$r \cdot \mu mg \cos \theta = \frac{mr^2}{2} \alpha \rightarrow \mu = \frac{r\alpha}{2g \cos \theta} = \frac{a}{2g \cos \theta}$$
. In this

analysis, f is causing angular retardation together with its effect

on translational motion as per equation above. Substituting value of f and μ in equation of translational

force it leads to
$$ma = mg\sin\theta - \frac{a}{2g\cos\theta} \cdot mg\cos\theta \rightarrow a = g\sin\theta - 0.5a \rightarrow 1.5a = 0.5 \times 10 \rightarrow a = \frac{10}{3} \text{ m} \cdot \text{s}^{-2}$$

Thus, using third equation of motion $v^2 = u^2 - 2as$, with the given data that v = 0, u = 5 m/s and $a = a = \frac{10}{10}$ m s⁻² it leads to us a $\frac{u^2}{25} = \frac{25}{15} = 2.75$ m

$$a = a_u = \frac{10}{3} \text{ m} \cdot \text{s}^{-2}$$
 it leads to us $s = \frac{u}{2a_u} = \frac{23}{2 \times \frac{10}{3}} = \frac{13}{4} = 3.75 \text{ m}.$

Note: Both the approaches lead to same result, while in the instant case COM approach is simple and consumes less effort and time. This judgment comes gradually from practice

Situation (b): Analysis of dynamics of cylinder reveals that after reaching maximum height, where both

translational velocity and angular velocity becomes Zero, due to tendency of the cylinder move down to the position of least potential under influence of $mg \sin \theta$, frictional force f would contribute to its rolling in a direction reverse of that during ascend, i.e. anticlockwise direction. This satisfies necessary condition $v = r\omega$. Thus equation net force on cylinder and its acceleration would be same as that in situation (a). Moreover, during rolling friction is conservative and hence when cylinder return to the bottom, it will have same magnitude of velocity, but downward. Thus the rolling up and down of cylinder can be compared to free fall under gravity except that in this case downward acceleration along the slope will



be $a = \frac{10}{3} \text{m} \cdot \text{s}^{-2}$ determined in DYM approach in case situation (a) instead of g. Accordingly, using First

Equation of motion, time of the cylinder to return would be $v = u + at \rightarrow -5 = 5 + (-\frac{10}{3})t \rightarrow t = 3$ sec.

Note: Inclusion of part (b) in the problem makes it essential to analyze dynamics of the cylinder to determine acceleration. This calls upon a hybrid approach in solving the problem if solution is initiated with COM approach. Therefore, in this problem right through NLM approach is suitable.

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Science in general and Physics in particular are not a subject to learn, but an area of observation and exploration by correlation, integration and analysis of repetitive nature, and then conclusion.

It is a real thrill, full of fun. But, it can't be done in dicrete manner, it has to be done patiently, like climbing stair far a faster and purposeful journey. This is where role of education come in; it is to streamline the process.



Growing with Concepts: Chemistry

LIQUEFAIATION OF GASES

Kumud Bala

The liquefaction of a gas takes place when the intermolecular forces of attraction become so high that they bind the gas molecules together to form the liquid state. The intermolecular forces of attraction can be increased either by increasing the pressure so that the molecules come close together or by cooling the gas so that the kinetic energy of the molecules decreases and their motion becomes slow. Hence, a gas can be liquefied by cooling or by application of pressure or the combined effect of both. Gases like ammonia, sulphur dioxide, hydrogen chloride, carbon dioxide etc. could be liquefied any one of the modes mention above, i.e. either by application of pressure (at room temperature) or by cooling (at atmospheric pressure). However, the effect of temperature on the liquefaction of gases is found to be very important as higher the temperature of the gas, more difficult is to liquefy it and hence a higher pressure is required. For example, pressure required to liquefy carbon dioxide at different temperature are given below:

| Temp.°C | -50 | -30 | -10 | 10 | 20 | 30 | 30.98 |
|--------------|-----|------|------|------|------|------|-------|
| Press.(atm.) | 6.7 | 14.1 | 26.1 | 44.4 | 56.5 | 71.2 | 73.9 |

Further, it is observed that gases like hydrogen, helium, oxygen and nitrogen etc. could not be liquefied at room temperature by application of pressure alone, howsoever high it may be. Hence, at one time, these gases were called 'permanent gases'. Now, it is well known that each of these gases could also be liquefied provided first it is cooled down to a particular temperature. In other words, for each gas, there is a particular temperature above which it cannot be liquefied, howsoever high pressure applied on the gas. This temperature is known as critical temperature. "Critical temperature of a gas may be defined as that temperature above which it cannot be liquefied howsoever high pressure may be applied on the gas". The pressure required to liquefy the gas at the critical temperature is called critical pressure. The volume occupied by one mole of the gas at the critical temperature and critical pressure is called the critical volume. All the three collectively are called critical constants of the gas and are represented by T_c, P_c and V_c. For example critical constants of CO₂ are: $T_c = 30.98^{\circ}C_{*}(304 .10K)$, $P_c = 73.9 atm.$, $V_c =$ 95.6 cm³mol⁻¹.

Andrew's experiment: Andrews in 1861 was the first to study the critical phenomena experimentally using CO₂ gas. He studied the effect of pressure on the volume of CO₂ at different constant temperatures. Andrews observed that at high temperatures isotherm look like that of an ideal gas and the gas cannot be liquefied even at very high pressure. As the temperature is lowered the shape of the curve changes and data shows more and more deviations from ideal behavior. This is because CO₂ does not behave ideally as the temperature becomes lower and lower. Andrews plotted isotherm (P-V relation) of CO₂ gas at different temperature as shown in figure. At the lowest temperature employed, i.e. 13.1°C, at low pressure, CO₂ exists as a gas, as shown at the point A. As the pressure is increased, the volume of the gas decreases along the curve AB. At the point B, liquefaction of the gas starts. Hence, volume decreases rapidly along BC because liquid has much less volume than the gas. At the point C, liquefaction is complete. Now, the increase in pressure has very little effect upon volume because liquids are very little compressible. Hence, a steep curve CD is obtained. As the temperature is increased, horizontal portion becomes smaller and smaller and at 30.98°C it is reduced at a point E. This means that above 30.98°C.



the gas cannot be liquefied at all, however high pressure may be applied.

Thus, 30.98° C is the critical temperature. The corresponding pressure to liquefy the gas at the critical temperature is its critical pressure, P_c (73.9atm.) the volume occupied by 1 mole of the gas under these conditions is its critical volume, V_C (95.6 ml). Joining the end points of the horizontal portion of the different curves, we get a dome-shaped curve as shown in figure. We observed that a point like A in the figure represents gaseous state. A point like D represents a liquid state and a point within the dome shaped area represents existence of liquid and gaseous CO_2 in equilibrium. All the gases on isothermal compression show the same behavior as shown by CO_2 .

Continuity of state: It is possible to change a gas into a liquid or a liquid into a gas by a process such that there is always a single phase present. For example, in above figure, we can move from A to E vertically by increasing the temperature then we can reach the point G by compressing the gas at constant temperature along the 31.1°C isotherm. The pressure will increase, now we can move vertically down towards D by lowering the temperature. As soon as we cross the point H on the critical isotherm, we get liquid. Thus, at no stage during the process, we pass through two-phase region. This is called continuity of state between the gaseous and the liquid state.

Importance of critical temperature: The critical temperature of a gas is a measure of the strength of the intermolecular forces of attraction of that gas. Weaker are the intermolecular forces, more difficult is to liquefy the gas and hence lower would be the critical temperature of that gas. For example, helium and hydrogen have weak intermolecular forces. Thus, they are difficult to liquefy and have low critical temperatures. On the other hand, CO₂ and NH₃ have strong intermolecular forces of attraction, they can be easily liquefied and their critical temperature is high, which are above room temperature. Van der Waals constant 'a' is also a measure of the intermolecular forces of attraction. Hence, it is found that the values of the constant 'a' increase in the same order as the critical temperature. A comparison of van der Waals constant 'a' and the critical temperature, T_c for a few gases is given below:

| Gas | He | H ₂ | N_2 | CO | CO_2 | NH_3 |
|---------------|--------|----------------|-------|-------|--------|--------|
| $T_{c}(K)$ | 5.2 | 33.2 | 126.2 | 134.0 | 304.2 | 405.6 |
| a(atm.L²mol²) | 0.0341 | 0.244 | 1.39 | 1.49 | 3.59 | 4.17 |

The liquid state:- The liquids differ from gases in one important aspect, i.e. whereas in case of gases the molecules are far apart from each other so that the volume occupied by molecules as well as the forces of attraction between them are considered to be negligible, this is not so in case of liquids. In a liquid, the molecules are quite close together so that there are considerable forces of attraction between them and hence they are held together into a definite volume. However, these forces of attraction are not as large as exit between the constituent atoms, ions, or molecules of a solid which fix these particles into definite positions so that the solids have a definite volume as well as a definite shape and a perfectly ordered arrangement of their constituent particles. possess fluidity like The liquids gases but incompressibility like solids. As a matter of fact, a liquid state may be considered as an intermediate state between the gas and the solid.

The behavior of liquids give some characteristic properties to the liquids such as a definite volume but no definite shape, incompressibility, diffusion, fluidity (or viscosity), evaporation (or vapour pressure), surface tension etc. These properties can be explained on the basis of 'kinetic molecular theory of liquids' which is based upon the following postulates: (i) liquids are composed of molecules. (ii) the molecules of the liquids are quite close together. (ii) The intermolecular forces of attraction in a liquid are quite large. (iv) due to weak intermolecular forces, the molecules are in constant random motion. (v) the aversge kinetic energy of the molecules of a liquid is directly proportional to their absolute temperature.

Properties of lquids:- (i) Vapour pressure:suppose some liquid is placed in an evacuated vessel connected to a manometer as shown in figure. According to kinetic theory of liquids, the molecules of the liquid are constantly moving in different directions with different speeds. Thus, as these molecules are moving with different speeds, they possess different kinetic energies. At any particular temperature, the energy of some of the molecules may be so high that they may overcome the force of attraction by the neighbouring molecules and may leave the liquid and come in the space above the liquid. This process is called evaporation. As the time passes, more and more molecules leave the liquid and come in the space above the liquid. The molecules thus present above the liquid are called vapour. The molecules in the vapour phase are also

constantly moving and some of them strike the surface of the liquid and may be



• For example, iceberg, sea water and steam

recaptured by the liquid. This process is called condensation. If the liquid is added into the evacuated vessel, then, initially, as there are no molecules of the vapour, the rate of condensation is zero. However, if temperature is kept constant, the evaporation continues at constant rate, as shown in figure by straight line plot.



However, with the passage of time, as the number of molecules in the vapour phase becomes more and more, the rate of condensation also increases. Ultimately, a stage is reached when rate of condensation becomes equal to the rate of evaporation, i.e. as many molecules re-enter into the



liquid as leave the liquid in the same time. This state is called state of equilibrium. The pressure exerted by the vapour at this stage is called vapour pressure. Hence, vapour pressure of a liquid at any temperature may be defined as the pressure exerted by the vapour present above the liquid in equilibrium with the liquid at that temperature.

Some important results:

Cooling caused by evaporation:- when liquid evaporates, the more energetic molecules leave the liquid. As a result, the average kinetic energy of the remaining liquid decreases and hence the temperature falls.

Factors affecting vapour pressure:- (a) nature of the liquid: if the intermolecular forces of attraction in the liquid are weak, the molecules can easily leave the liquid and come into the vapour phase and hence the vapour pressure is higher. For example, the vapour pressure of ethyl alcohol, ether etc. is higher than that of water at same temperature as shown in the figure. (b) effect of temperature: as the temperature of a

liquid is increased, the vapour pressure of the liquid increases. This can be explained on the basis of Maxwell's distribution of energies. At a particular temperature, all the molecules do not have the same energy. A plot of the fraction of molecules versus their corresponding kinetic energies is shown in the figure. Only those molecules can escape from liquid into vapour phase whose kinetic energy is more than E. With increase in temperature, the curve shifts as shown. The fraction of molecules with kinetic energy greater than E inceases. As a result, the molecules escaping into the vapour phase increases and so does the vapour pressure.

Boiling Point: the vapour pressure of a liquid increase as the temperature is increased. The vapour escaping are only from the surface of the liquid. Now, if the temperature is further increased till the vapour pressure becomes equal to atmospheric pressure, the vapour in the form of bubbles from below the surface start rising to the surface and escape into the air. The temperature at which this happens is called the boiling point. Thus, boiling point of a liquid is defined as the temperature at

which the vapour pressure of the liquid becomes equal to the external pressure(i.e. the atmospheric pressure). When the external pressure is



Page 44 of 50 5th Monthly e-Buletin dt 1st March'19 in Fourth Year of GgyanVigyanSaritaशिक्ष



Kinetic energy

normal atmospheric pressure(i.e. 760mm), the boiling point is called the normal boiling point. When the external pressure is equal to 1 bar, the boiling point is called standard boiling point of the liquid. Standard boiling point of a liquid is slightly less than 1 atmosphere pressure. For example, normal boiling point of water is 100°C (373K) whereas its standard boiling point is 99.6°C (372.6K). The normal boiling point for any liquid is obtained from the vapour pressure- temperature curves shown in figure above.

Some applications of effect of external pressure on boiling point: (i) Obviously, if the external pressure is higher, more heat will be required to make the vapour pressure equal to the external pressure and hence higher will be the boiling point. That is why in hospitals, surgical instruments are sterilized in autoclaves in which boiling point of water is raised by using a weight to cover the vent. (ii) Similarly, if the external pressure is decreased, the boiling point is lowered. This is the reason that a liquid boils at a lower temperature on the top of a mountain (where pressure is low) than on the sea shore. That is why on hills, use of pressure cooker is essential for cooking food. (iii) Further, the above principle is used for purifying the unstable liquids by distillation under reduced pressure. This process is called vacuum distillation. (iv) Heat of vaporization (ΔH_v)- when the liquid starts boiling, if extra heat is supplied to the liquid, it is used up not in increasing the temperature of the liquid but overcome the intermolecular forces of attraction, existing in the liquid and thus, changing the liquid into vapour. Hence, the temperature remains constant till whole of the liquid changes into vapour. "The amount of heat required to change 1 mole of the liquid into its vapour at the boiling point is called the heat of vaporization of the liquid". Obviously, greater the intermolecular forces of attraction present in a liquid, greater are the heat of vaporization and higher is the boiling point. For example, the heat of vaporization and boiling point of water are more than those of ether, acetone and benzene etc.

Surface tension: surface tension is a characteristic property of liquids which arises due to the fact that the molecules of the liquid at the surface are in different situation than those in the interior of the liquid. For example, a molecule lying inside the liquid is surrounded by other molecules and also attracted equally in all directions. Hence, the net force of attraction acting on the molecules is zero. However, a molecule lying at the surface is attracted more by the molecules lying in the bulk of the liquid than by the molecules lying above it in the vapour phase. Thus, a molecule lying at the surface experiences a net inward attraction. As a result of this inward pull on all molecules lying at the surface. the surface behaves as if it were under tension (like a stretched membrane). Due to this property of liquids, surface experience a net inward attraction. This property of liquid is called surface tension. "Surface tension of a liquid is defined as the force acting at right angle to the surface along one centimeter length of the surface." Thus, the unit of surface tension is dynes per cm in S.I system.



Further, as a result of the inward pull on the molecules at surface, the the surface of the liquid tends to contract to the smallest possible area for a given volume of the liquid. This gives the lowest energy

state of the liquid. It is for this reason that the drops of a liquid are spherical because for a given volume, a sphere has minimum surface area. To increase the area of the surface, some work has to be done against the inward pull. For example, consider a soapsolution film contained in rectangular wire frame ABCD in which the side BC is movable. In order to

extend the surface area of the film, the movable wire has to be pulled from position BC to position B'C'. Thus, some work has to be done against the force of surface tension. The work in ergs required to be done to increase or extend the surface area by 1 cm² is called surface energy. The



unit of surface energy is therefore, ergs per square cm or joules per square meter in S.I system.

In terms of dimensions, surface energy = work per



those of surface tension. Thus, the surface energy is same thing as surface tension. Hence, the definition of surface energy is sometimes taken as the definition of surface tension.

Consequences of surface tension:- (i) Spherical shape of drops- the liquid drops have nearly spherical shapes. We have learnt that surface tension tries to decrease the surface area of a liquid to the minimum. Since the sphere has minimum surface area for the given volume of liquid, therefore, the liquid tries to adopt spherical shape. That is why mercury drops are spherical shape. It may be noted that water drop in vacuum is perfectly spherical. On a flat surface droplets are slightly flattened due to gravity. The shape of the water drop is distorted due to action of gravity. (ii) Fire polishing of glass- sharp glass edges are heated to make them smooth. This is because on heating, glass melts and takes up rounded shape at the edges which has minimum surface area. This is called fire polishing of glass.

(iii) Rise of a liquid in a capillary tube:- Suppose one end of a capillary tube is put into a liquid that wets glass. It is found that the liquid rises into capillary



tube to a certain height and then stops. This rise is obviously due to the inward pull of surface tension acting on the surface which pushes the liquid into the capillary tube. It is because of the same reason that oil rises into the wick of an oil lamp or water below the surface of the earth rises in the plants through the roots or ink rises in a blotting paper. It may be mentioned here that in case of liquids which do not wet glass, e.g., mercury, the level inside the capillary falls below the level outside (in figure).

Further, whereas the upper surface of a liquid that wets glass is concave, that of mercury is convex. Such a curved surface of a liquid is known as meniscus. The concave meniscus of water and the convex meinscus of mercury in a glass tube may be explained on the basis of cohesive and adhesive forces. The attractive forces existing between the molecules of the same substance are known as cohesive forces, e.g., between the molecules of water or molecules of mercury etc. where as those existing between molecules of different substances are known as adhesive forces, e.g., between water and glass or mercury and glass etc. In case of water taken in a glass tube, adhesive forces are stronger than cohesive forces whereas it is reverse for mercury taken in a glass tube.

(iv) Effect of nature of the liquid on surface tension:surface tension is a property that arises due to the intermolecular forces of attraction among the liquid. molecules of the Greater are the intermolecular forces of attraction, higher is the surface tension of that liquid (v) Effect of temperature on surface tension:- The surface tension of liquids generally decreases with increase of temperature and becomes zero at critical temperture (where the meinscus between the liquid and the vapour disappears). With increase of temperature, the kinetic energy of the molecules increases and, therefore the intermolecular attraction decreases. For example, the clothes are washed more efficiently in hot water than in cold water due to decreased surface tension in hot water.

Viscosity :- It is well known that all liquids do not flow with the same speed. Some liquids like water, ether etc. flow rapidly while some other liquids like glycerine, castor oil etc. flow quite slowly. This indicates that every liquid has some internal resistance to flow called "viscosity". The liquids which flow slowly, obviously have high internal resistance which is due to strong intermolecular forces and therefore, are said to be more viscous or are said to have high viscosity. On other hand, the liquids which flow rapidly have low internal resistance which is due to weak intermolecular forces and hence are said to be less viscous or are said to have low viscosity. To understand the nature of the internal resistance or friction existing within a liquid, consider a liquid flowing through a narrow tube (in figure). All parts of the liquid do not move through the tube with the same velocity. Imagine the liquid to be made up of a large number of thin cylidrical coaxial layers. The layer which is in contact with the walls of the tube is almost stationary. As we move from the walls towards the centre of the tube, the velocity of the cylindrical lavers keep on increaseing till it is maximum at the centre. This type of flow in which there is a regular gradation of velocity in going from one layer to the next is called laminar flow. Conversely, we may say that as we move from the centre towards the walls, the velocity of the layer keeps on decreasing. In other words, every layer offers some resistance or friction to the laver immediately below it. " the force of friction with one part the liquid offers to another part of the liquid is called viscosity". The flow of a liquid on a fixed horizontal surface may be represented in a similar manner as follows:



each having area 'A' square cm separated by a distance dx cm, and having a velocity difference of dv cm/sec, is given by the relation $f \alpha A \frac{dv}{dx}$ or $f = \eta A \frac{dv}{dx}$ where η is a constant known as coefficient of

viscosity and $\frac{dv}{dx}$ is the velocity gradient i.e. the change in velocity with distance. If dx = 1 cm, A = 1 cm^2 and dv = 1cm/sec, then $f = \eta$. Hence, coefficient of viscosity may be defined as the force of friction (in dynes) required to maintain a velocity difference of 1 cm/sec between two parallel layers, 1 cm apart and each having an area of 1 sq.cm Some important results related with property of viscosity are as follows: (i) Units of viscosity:- $f = \eta A \frac{dv}{dx}$ $\therefore \eta = \frac{f.dx}{A.dv} = \frac{dynes \times cm}{cm^2 \times cm/sec} = dynes \text{ cm}^{-2}\text{sec.}$ Thus, the units of viscosity are dynes sec cm⁻². This quantity is called 1 poise. As force = mass× acceleration i.e. $f = m \times a$, we can also write $\eta =$ $\frac{m \times a \times dx}{A \times dv} = \frac{g \times cm^{-2} \times cm}{cm^2 \times cm \times s^{-1}} = \text{gcm}^{-1}\text{s}^{-1} \text{ i.e. 1 poise} = 1\text{gcm}^{-1}\text{s}^{-1}\text{ I.n SI units, } \eta = \frac{f \cdot dv}{A \cdot dx} = \frac{N \times m}{m^2 \times ms^{-1}} = \text{Nm}^{-2}\text{s or Pas or}$ in place of g cm⁻¹s⁻¹, we have Kg m⁻¹s⁻¹, 1 poise = 1gcm⁻¹s⁻¹ 10⁻¹Kg m-1s-1 (ii) Effect of nature of the liquid on viscosity: The viscosity of a liquid is also related to the intermolecular forces of attraction among the molecules. Greater are the intermolecular forces, higher is the viscosity of the liquid. Thus, water has higher viscosity than methyl alcohol because inter molecular forces in water are greater than those in methyl alcohol. It is important to know that hydrogen bonding and van der Waals forces are strong enough to result into high viscosity of the liquid. (iii) Effect of temperature on viscosity:- with increase of temperature, the kinetic energy of the molecules of the liquid increases which can over come the intermolecular forces. Hence, the liquid starts flowing faster. In other words, the viscosity of a liquid decreases with increase in temperature. It has been found that the decrease is about 2% per degree rise in temperature

Assingment

- 1. The critical temperature of a substance is
 - (a) the temperature above which the substance undergoes decomposition
 - (b) the temperature above which a substance can exist only as a gas
 - (c) boiling point of the substance
 - (d) all are wrong.
- **2.** Critical temperature of the gas is the temperature-
 - (a) below which it cannot be liquified
 - (b) above which it cannot be liquified

- (c) at which it occupies 22.4L of volume
- (d) at which one mole of it occupies volume of 22.4L
- **3.** The van der Waal's parameters for gases W, X, Y and Z are

| Gas | a (atm L²mol-²) | b(L mol ⁻¹) |
|-----|-----------------|-------------------------|
| W | 4.0 | 0.027 |
| Х | 8.0 | 0.030 |
| Y | 6.0 | 0.032 |

Z12.00.027Which one of these gases has the highest critical
temperature?(a) W(b) X(c) Y(d) Z

 If the van der Waal's constants of a gas A are given as: a= 6.5 atm L²mol⁻², b= 0.056 L mol⁻¹ then critical pressue of A is-

(a) 56.24 atm (b) 76.77 atm

(c) 42.44 atm (d) 36.42atm

- 5. Which of the following statements is false regarding liquids?
 - (a) Lliquids diffuse slowly than gases
 - (b) During evaporation of liquids, heating is always caused
 - (c) Vapour pressures of liquids increase with rise in temperature
 - (d) Viscosity of liquids decreases with rise in temperature
- 6. Which of the following properties of liquids does not decrease with rise in temperature?
 - (a) Vapour pressure
 - (b) Viscosity
 - (c) Surface tension
 - (d) Density
- 7. The rise of a liquid in a capillary tube is due to
 - (a) Viscosity (b) Diffusion
 - (c) Surface tension (d) Osmosis
- 8. With rise in temperature, viscosity of a liquid
 - (a) increases
 - (b) decreases
 - (c) remains constant
 - (d) may increase or decrease

- 9. When rate of evaporation and condensation become equal in a closed container containing a liquid?
 - (a) Cooling will be caused
 - (b) The amount of the substance in the liquid and vapour states become constant
 - (c) The amount of the substance in the liquid and vapour states becomes equal
 - (d) Some liquid starts solidifying
- 10. On heating a liquid, its surface tension
 - (a) increases (b) decreases
 - (c) remains same (d) is reduced to zero
- 11. The heat of vaporization of H_2O , C_2H_5OH and CS_2 are 40.6, 38.6 and 26.8kJmol⁻¹ respectively. The order of decreasing intermolecular forces in these liquids is
 - (a) $H_2O > C_2H_5OH > CS_2$
 - (b) $CS_2 > C_2H_5OH > H_2O$ (c) $H_2O > CS_2 > C_2H_5OH$
 - (d) $CS_2 > H_2O > C_2H_5OH$
- 12. Liquids diffuse slowly as compared to gases because
 - (a) the molecules are held together by strong intermolecular forces
 - (b) the molecules of liquids are heavy
 - (c) liquids have definite shape
 - (d) the molecules of liquids undergo large number of collisions with the neighbouring molecules
- 13. The state of balance between evaporation and condensation of a liquid is called
 - (a) critical state (b) sublimation
 - (c) dynamic equilibrium (d) crystallisation.

ANSWERS

| | | | | | | | 13. (c) | 12. (d) | 11. (a) |
|---------|--------------------|--------|--------|--------|--------------------|----------------|--------------------|---------|---------|
| 10. (b) | (q) [.] 6 | (d) .8 | (ɔ) ·/ | (y) .9 | 2 [.] (p) | (q) ∙ † | 3 [.] (q) | 5. (b) | 1.(b) |

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—00—

SCIENCE QUIZ : March-2019

Kumud Bala

- 1. The nucleons are
 - (a) Protons and electrons
 - (b) Neutrons and electrons
 - (c) Protons and neutrons
 - (d) None of these
- 2. The isotope deuterium of hydrogen has -
 - (a) No neutrons and one proton
 - (b) One neutron and two protons
 - (c) One electron and two neutrons
 - (d) One proton and one neutron
- 3. The electrons present in the outermost shell are called -
 - (a) Valence electron
 - (b) Octate electrons
 - (c) Duplet electrons
 - (d) Valence electron
- 4. An α particles contains
 - (a) 4 positive charge and 2 mass unit
 - (b) 2 positive charge and 4 mass unit
 - (c) 2 positive charge and 2 mass unit
 - (d) 4 positive charge and 4 mass unit
- 5. The atomic number of sodium is 11 and its mass number is 23. It has
 - (a) 11 neutrons and 12 protons
 - (b) 12 protons and 11 electrons
 - (c) 11 electrons and 12 neutrons
 - (d) 12 electrons and 11 neutrons.
- 6. The electronic configuration of chlorine is (a) 2,7 (b) 2,8,8,7 (c) 2,8,7 (d) 2,7,8
- 7. The isotope used to remove the brain tumors and treatment of cancer is
 - (a) U-235 (b) Na- 24 (c) Iodine (d) Co-60
- 8. The isobars among the following is (a) ${}_{20}^{40}Ca$, ${}_{17}^{35}Cl$ (b) ${}_{18}^{20}Ar$, ${}_{19}^{20}K$ (c) ${}_{8}^{16}O$, ${}_{8}^{16}O$ (d) ${}_{7}^{19}X$, ${}_{7}^{13}Y$
- 9. The element with same valence electrons form same type of ions (a) 8¹⁶O, 11²³Na
 (b) 18²⁰Ar, 19²⁰K

(c) ${}_{5}{}^{14}N$ ${}_{13}{}^{27}Al$ (d) ${}_{11}{}^{23}Na$ ${}_{19}{}^{20}K$

- 10. In the α scattering experiment, few α particles rebounded because-
 - (a) Most of the space in the atom is occupied
 - (b) Positive charge occupies very little space
 - (c) The mass of the atom is concentrated in the centre
 - (d) All positive charge and mass of the atom is concentrated in small volume.
- 11. Why are some elements inert?
 - (a) Because their outermost shell is completely filled
 - (b) They have same number of protons and electrons
 - (c) Mass of an atom is concentrated in nucleus(d) Number of protons and electrons are not same in these atoms
- 12. Where is the mass of an atom concentrated?(a) Nucleus(b) Proton
 - (c) Electron (d) Neutron
- 13. On the basis of Rutherford's model of an atom, which sub- atomic particle is present in the nucleus of an atom?
 - (a) Electron (b) Proton
 - (c) Protium (d) Tritium
- 14. Which atom has same number of electrons in L and M shell?
 - (a) K (b) Ar (c) Cl (d) Ca
- 15. The atomic number of four elements A, B, C and D are 9, 10, 13, and 18 respectively. Which of them will form a cation?

(a) A (b) C (c) D (d) B

- 16. Degree Celsius and Kelvin are two units of measuring temperature. Which of these is SI unit?
 - (a) Degree Celsius (b) Kelvin
 - (c) Both : (a) and (b) (d) none of them
- 17. Hydrogen and oxygen combine in the ratio of 1:8 by mass to form water. What mass of oxygen gas would be required to react completely with 3g of hydrogen gas?

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- (a) 1g (b) 24g (c) 16g (d) 2g
- 18. Pick up the wrong pairs/ combination.
 - (a) 6.022×10^{23} molecules of oxygen = 32 of oxygen (b) 6.022×10^{23} ions of sodium = 23g of Na (c) 6.022×10^{23} atoms of C = 24g of carbon (d) 6.022×10^{23} atoms of H = 1g of H-atoms
- 19. Which postulate of Dalton's atomic theory is the result of law of conservation of mass?
 - (a) Atoms cannot be created or destroyed in a chemical reaction.
 - (b) Atoms of different elements have different sizes, masses and chemical properties.
 - (c) Atoms are very tiny particles which cannot be divided further.
 - (d) None of these
- 20. If one mole of carbon atoms weighs 12 grams, what is the mass of 1 atom of carbon?

(a) $1.99 \times 10^{-23} g$ (b) 6.022×10^{-23}

- (c) $1.99X10^{23}$ (d) 1/12g
- 21. The atomicity of $K_2Cr_2O_7$ is (a) 9 (b) 11 (c) 10 (d) 12
- 22. The molecular mass of X is 106. X among the following is –

(a) $CaCO_3$ (b) SO_3 (c) Na_2CO_3 (d) NaCl

23. How many moles are present in 28g of nitrogen atoms?

(a) 1 mole (b) 2.3 mole (c) 0.5 mole (d) 2 moles

- 24. What are names of the elements present in baking powder?
 - (a) calcium, oxygen
 - (b) sodium, hydrogen, carbon, oxygen (c) hydrogen, sodium, carbon
 - (d) potassium, sulphur, oxygen.

(Answers to this Science Quiz January'19 shall be provided in Monthly e-Bulletin dt. 1^{st} March'19)





Never regard study as a duty, but as the enviable opportunity to learn to know the liberating influence of beauty in the realm of the spirit for your own personal joy and to the profit of the community to which your later work belongs.

(Albert Einstein)

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Nothing is more important in our national life than the welfare of our children.

- Harry S. Truman (33rd President of the United States)

<u>PREMISE:We are pleased to adopt a song</u>" इतनी शक्ति हमें देना दाता....."from a old Hindi MovieDo 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 nonoraanizational 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 he 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 ||

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

Together Each Achieves More (TEAM)





