GYAN VIGYAN SARITA:शिक्षा

A non-remunerative, non-commercial and non-political initiative to Democratize Education as a Personal Social Responsibility (PSR)

8th Quarterly e-Bulletin dt 1st July'18, Second Year of Publication

Special Issue: National Doctors' Day 1st July

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Editor, Gyan Vigyan Sarita - शिक्षा,e-Bulletin:Dr SB Dhar
Coordinator-Gyan Vigyan Sarita,: Dr Subhash Joshi
Graphics Designer: Gyan Vigyan Sarita

Address: #2487, Betina, Mahagun Moderne, Sector-78, NOIDA, Uttar Pradesh, PIN: 201309,, (INDIA).

Aim at the Best, but...

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

Infrastructural Requirement for Centers in Interactive Online Mentoring Sessions (IOMS)

Learning Center (if asked for by Mentor)		Mentoring Center (if asked for by Mentor)	
Estimated Capital Cost (One Time)			
Particulars	**Cost (in Rs)**	**Particulars**	**Cost (in Rs)**
Desktop (without monitor)	20,000	Laptop	25,000
Projector	15,000	Projector	-
Web camera	10,000	Web camera	-
Mixer cum amplifier with Speaker and Wireless microphones	15,000	Headset with Microphone	3,000
Wireless Surface Writing device	15,000	Wireless Surface Writing device	15,000
Total	75,000		43,000
Estimated Recurring Cost			
Internet charges, based on estimated monthly data transfer which depends upon choice of cloud platform, and tariffs of ISP		Internet charges, based on estimated monthly data transfer which depends upon choice of cloud platform, and tariffs of ISP	
Cloud platform : a. Subscription whether it annual as in WebEx or One time with AMC like in as in UTP+. b. Cloud platform is a shared resource across Learning Centers benefitting from IOMS. c. The IOMS envisages session for more than one centre together, these charges may be shared across, or one centre bears total cost sequentially. It is purely in mutual agreement between Learning Centers. d. Benefit of sharing of charges of cloud platform can be optimized with offset of schedule of sessions of IOMS.		IOMS is since an initiative driven with Personal Social Responsibility (PSR) operating n Zero-Fund-&-Zero-Asset (ZFZA) basis, the Cloud Platform has to provided by Learning Centers benefitting from IOMS. Gyan Vigyan Sarita will be pleased to connect Learning Centers for collectively complementing the cost of Cloud Platform for arriving at a mutual agreement on financial sharing. So also IT Infrastructure with Dr Joshi has been in use and is working. But, at any stage if upgradation becomes essential, extended hand by learning centers is gratefully welcomed on ZFZA basis. The same is true for any other mentor joining IOMS	

Specification: These were practiced independently, 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 by deriving motivation from **VIVEKDISHA, Belur Math**, which has been engaged in Online Teaching to about 22 Centers, since last 10 years. The only difference that IOMS has is in extensive use of Whiteboard.

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

Projector: Portronics LED Projector Beem 100", 100 Limen, 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: UTP+, by PeopleLink Unified Communications, Hyderabad with Six Users+Two Rooms. Its minimum bandwidth requirement is 256 mbps, with facilities to tune image resolution, frame rate, bitrate etc. seamless streaming of data Audio-video-whiteboard a necessity in IOMS. Without prejudice, any other platform that has been satisfactory tested for seamless data-transfer at or below 256 kbps is welcome.

Surface Writing Device: HUION make Model WH1409, it has wireless as well as wired communication with base computer.

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.**

संपादकीय

राष्ट्रीय चिकित्सक दिवस (National Doctors Day)

डाक्टर पृथ्वी पर ईश्वर का अवतार होता है। डाक्टर को हम चिकित्सक, वैद्य अथवा हकीम भी कहते हैं। ईश्वर जीवन देता है, डाक्टर उस जीवन को बचाकर रखता है। चिकित्सक हर देश की विरासत होता है। हर देश में उसका दर्जा वही होता है जो हमारे देश में है। हर देश में किसी न किसी दिन, किसी न किसी कारण से चिकित्सक दिवस अथवा डाक्टर्स डे मनाया जाता है। ब्राजील में चिकित्सक दिवस हर वर्ष 18 अक्टूबर को मनाया जाता है। सेंट ल्यूक जो खुद एक डाक्टर थे, उनके जन्मदिन के उपलक्ष्य में वहां यह दिन मनाया जाता है। वियतनाम में 27 फरवरी को यह दिन मनाया जाता है। ऑस्ट्रेलिया में 28 सितंबर को यह दिन मनाया जाता है। यही नहीं, पूरे विश्व में 19 मई को फैमिली डाक्टर्स डे मनाया जाता है। भारत में यह दिन 1 जुलाई को मनाया जाता है। संयुक्त राज्य अमेरिका में 30 मार्च को राष्ट्रीय डाक्टर दिवस मनाया जाता है। अमेरिका में यह दिन डा0 क्राफर्ड डब्लू लांग के सम्मान में मनाया जाता है। डा0 लांग ने सर्जरी के इतिहास में वर्ष 1842 में ईथर एनेस्थेसिया का पहली बार इस्तेमाल कर सर्जरी के दौरान होने वाले मरीज के दर्द को कम करने का प्रयास किया था।

हर देश में इस दिन को मनाने का उद्देश्य होता है कि हम अपने डाक्टर के प्रति श्रद्धावान हों, उसके प्रति समर्पण का भाव रखें, प्रतिबद्ध रहें और उसके उपचार के बाद ठीक होने पर उसको आभार व्यक्त करना न भूलें।

डाक्टर्स डे जब हम मनाते हैं तब हमें यह अवसर मिलता है कि अगर हम डाक्टर हैं तो अपने अंदर झांकने का प्रयास करें कि क्या हम अपने मरीजों के प्रति संवेदनशील हैं? अगर हम एक मरीज हैं तो हमें यह सोचना चाहिये कि डाक्टर भी हमारे बीच का ही है। उसकी भी जरूरते हैं, उसका भी परिवार है, वह भी सरकार के विभिन्न नियमों - उपनियमों से बंधा है। सच तो यह है कि डाक्टर से कभी भूल हो सकती है, पर अगर उसे रोग के कारणों की जानकारी है, उसे रोग को ठीक करने का अनुभव है, तब वह मरीज को अपने अंतिम प्रयास तक ठीक करने की कोशिश करता है।

जिस प्रकार सैनिक देश के भू-भाग की रक्षा, दुश्मनों को बाहर खदेड़ कर करते हैं, ठीक उसी प्रकार डाक्टर हमारे स्वास्थ्य को सुधार कर, बीमारियों को भगाकर शरीर की रक्षा करते हैं। किसी दुर्घटना के समय तो दो ही याद आते हैं-एक भगवान और दूसरा डाक्टर। भगवान के दिये अंगों को क्षतिग्रस्त होने पर केवल डाक्टर ही ठीक कर पाता है। एक अच्छा डाक्टर वह होता है जिसका स्वभाव हंसमुख और आचरण मिलनसार होता है।

देश के स्वतंत्र होने के 70 साल बीत जाने के बाद भी भारत के दूर-दराज के हिस्सों में अच्छी डाक्टरी सेवा का अभाव है क्योंकि कोई भी अच्छा डाक्टर शहर छोड़कर गांव अथवा दूर-दराज के इलाकों में नहीं जाता है। इस कारण गांवों की चिकित्सा व्यवस्था आज भी झाड़-फूंक, ओझा-सोखा, नीम-

हकीम के सहारे चल रही है। एक और बिडंबना धीरे धीरे डाक्टरों में फैल रही है कि वे उन कंपनियों की दवाओं को मरीज के लिये लिखते हैं जिनसे उन्हें अच्छा कमीशन मिलता है। मरीज की आर्थिक स्थिति से डाक्टर असंवेदनशील हो गये हैं। आज प्रदूषण फैलाने वाले अधिक हो गये है, बीमारियां पैदा करने वाले बढ़ गये हैं परंतु जीवन की निःस्वार्थ रक्षा करने वाले कम होते जा रहे हैं।

उपचार में मानवीय संवेदना का बहुत योगदान रहता है। जब डाक्टर मरीज से हंसकर, मुस्कराकर केवल यह कह देता है कि आप ठीक हो रहे हैं तब मरीज का आधा रोग खुद ही भाग जाता है। एक अच्छा डॉक्टर अपने मरीज की बीमारी को दूर करने के लिए सबसे पहले उसके दिमाग में यह भर देता है की वह ठीक हो रहा है।

अच्छा डाक्टर बनने के लिये मरीज की मानसिकता को समझना बहुत जरूरी होता है। ऐसा होने पर उसे पता चल जाता है कि मरीज की मुख्य आवश्यकता डाक्टर को देखते ही क्या होती है? दवा तो डाक्टर के लिखने के बाद आती है, पर डाक्टर अगर अपने मरीज के प्रति अपनत्व का भाव रखता है तो उसके हाव-भाव को देखते ही मरीज ठीक होना शुरू कर देता है।

हर मरीज अपने डाक्टर के पास पूरी ईमानदारी से बिना संदेह जाता है। वह पूरे विश्वास और श्रद्धा के साथ अपने को डाक्टर के हवाले कर देता है। अपनी हर प्रकार की अंदर की कमियों को उसके सामने उजागर कर देता है। कठिन परिस्थितियों में तो वह डाक्टर द्वारा की जाने वाली सर्जरी के दौरान होने वाली अपनी मृत्यु के लिये स्वयं को उत्तरदायी मानने वाले कागज पर भी बिना देर दस्तखत कर देता है।

डाक्टर विधान चंद्र जिनके प्रति श्रद्धा व्यक्त करने के लिये भारतवर्ष में यह दिन मनाया जाता है, वह एक चिकित्सक और स्वतंत्रता सेनानी थे। 1961 में उन्हें भारतरत्न से सम्मानित किया गया था। वह पश्चिम बंगाल के दूसरे मुख्यमंत्री रहे थे। उनकी जन्मतिथि और पुण्यतिथि दोनों ही पहली जुलाई है।

विधानचंद्रराय का जन्म बिहार में 1882 में पटना में हुआ था। कोलकाता में उन्होंने अपनी चिकित्सा शिक्षा पूर्ण किया। उनको एमआरसीपी और एफआरसीएस की उपाधि लंदन से मिली थी। 1911 में उन्होंने अपनी चिकित्सा जीवन की शुरूआत की थी। वे कोलकाता मेडिकल कालेज में व्याखाता रहे। महात्मा गांधी के साथ रहते हुये उन्होंने असहयोग आंदोलन में सक्रिय भूमिका निभायी। भारतीयों के प्रति प्रेम और समाज के उत्थान की भावना से उन्होंने राजनीति में कदम रखा था।

किसी भी व्यक्ति को डाक्टर की जरूरत तब पड़ती है, जब वह किसी बीमारी के पैदा होने वाले कारणों के प्रति लापरवाह होजाता है। डाक्टर मरीज की इसी लापरवाही को दूर करता है। यही लापरवाही दूर करना इलाज कहलाता है। अगर किसी को शुगर अथवा उच्चरक्तचाप की बीमारी है तो उसे चाहिये कि वह अपनी नियमित जांच अपने डाक्टर की राय के अनुसार कराता रहे। यदि वह ऐसा करता है तो निश्चित तौर पर वह दवाइयों से दूर रहेगा और स्वस्थ रहेगा।

कहा जाता है कि बहुत दिनों पहले, हर पेशे का व्यक्ति धन कमाने की होड़ में रहता था, सिवाय डाक्टर के। पर आजकल डाक्टर इस रोग से अछूता नहीं रह गया है। हमें नहीं भूलना चाहिये कि डाक्टर होना एक काम नहीं है बल्कि एक चुनौती है। हर पेशे में हुयी भूलें सुधारी जा सकती हैं, परंतु डाक्टरी पेशे में एक छोटी सी चूक भी जीवन का अंत कर सकती है।

बिधानचंद्र राय को 4 फरवरी 1961 को भारतरत्न से सम्मानित किया गया था। 1991 में भारत सरकार ने डाक्टर्स डे मनाने की शुरूआत की थी। 1976 में उनके सम्मान में डा बीसी राय पुरस्कार भी शुरू किया गया था।

आइये, डॉक्टर्स डे पर हम हर हाल में डाक्टर के प्रति कृतज्ञ रहना सीखें और अपने चारों ओर के वरिष्ठ नागरिकों, असहाय अथवा आर्थिक रूप से कमजोर लोगों को उन सब बातों को सिखायें जिनसे वे स्वस्थ रह सकते हैं और बीमार होने से बच सकते हैं। साथ ही साथ, अगर हम पेशे से डॉक्टर हैं तो अपने बनानेवाले उस परमपिता परमेश्वर से प्रार्थना करें कि वह हमें इतनी शक्ति दे कि जब भी कोई मरीज अपनी बीमारी अथवा रोग के सिलसिले में हमारे पास आये तो हमारे अंदर मानवीय संवेदना बनी रहे और जितना हो सके हम ईश्वर का प्रतिनिधि बनकर उसकी सेवा-सुश्रुषा कर सकें जिससे हमारे द्वारा ली गयी मानव-सेवा की शपथ बनी रहे।

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OUR MENTORING PHILOSOPHY: Mentoring is not teaching, neither tuition nor coaching. It is an activity driven by passion, and commerce has no place in it. In this effort is to caution students that -

- This place is not where they will be taught how to score marks and get higher ranks, but to conceptualize and visualize subject matter in their real life so that it becomes intuitive.
- This place is not to aim at solutions but inculcate competence to analyze a problem and evolve solution.
- This place does not extend selective and personalized attention, rather an opportunity to become a part of which is focused on learning and problem solving ability collectively.
- This place provides an opportunity to find students above and below one's own level of learning. Thus students develop not in isolation but learn from better ones and associate in problem solving to those who need help. This group dynamics while create a team spirit, an essential attribute of personality, while one learns more by teaching others.
- This place has strategically chosen Online Mentoring, so that those who are unprivileged can gather at one point and those who can facilitate learning of such students by creating, necessary IT setup. Aseperate **Mentor's Manual**is being developed to support the cause.

We are implementing this philosophy through **Online Mentoring**

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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) Mathematics, b) Physics , c) Chemistry and d) English Gammar. 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 examinationsand a guide to theirsolutions in a structured manner, as a dynamic exercise to catalyse the conceptual thought process.

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None in this world is absolute,

None exists in isolation,

Everyone exists in context,

Everyone has a surrounding

Everyone is relative

—00—

An Appeal: Gyan Vigyan Sarita

A Non-organizational Initiative of a Small Set of Co-passionate Persons

Philosophy: Personal Social Responsibility (PSR)

Objective: Groom competence to Compete among unprivileged children from 9th-12th in Maths and Physics, 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 to the participators

Operation:

a. **Mode:** Online since July'16, using Google Hangouts, a free we-conferencing S/w, with connectivity upto 15 nodes.
b. **Participation:** Voluntary and Non-remunerative, Non-Commercial and Non-Political

Involvement:

a. **As Promote**r –
   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,
   iv. Sponsor Website.
b. **As Facilitator** –
   i. Provide space and infrastructure for **Online Mentoring Sessions (OMS)**, which is generally available, with a marginal add-on,
   ii. Garner support of elite persons to act as coordinators at a Learning Centre.
c. **As Participator** –
   i. As a Mentor,
   ii. As Coordinator,
   iii. As Editor and or contributor of thought provoking articles for e-Bulletin, which are relevant to the initiative, and make it more purposeful and reachable to the target audience.
   iv. As author of Chapters for Mentors' Manual, being uploaded as a Free Web Resource,
   v. Anything else that you feel can add value to the mission and make it more purposeful.
   vi. *Anything else that you consider to make this initiative to become more effective.*

Background: *The initiative had its offing in May'12, when its coordinator, a power engineer by profession, soonafter submission of Ph.D. Thesis in April'12, at IIT Roorkee, at the age of 61 years, decided to mentor unprivileged students.*

SARTHAK PRAYASH, a Ghaziabad based NGO, warmly accepted the proposition and created a facility to mentor students from 8+ to prepare in mathematics and physics and prepare them for engineering entrance tests. They warmly reciprocated and created a class room.

*Experience in this selfless social work were used to navigate across without losing focus. He was associated with SUBODH FOUNDATION from Sept'15 to Sept'16 during which he published a monthly e-Bulletin **SUBODH-पत्रिका** to create visibility across persons who could make a difference.*

*In Sept'16, post transition, the mission has been continued as a non-organizational entity **Gyan Vigyan Sarita**, with a set of Four persons, including retired **Prof. SB Dhar**, Alumnus-IIT Kanpur, a middle aged **Shri Shailendra Parolkar**, Alumnus-IIT Kharagpur, settled at Texas, US and **Smt. Kumud Bala**, Retired Principal, Govt. School Haryana. Earlier, they were complementing the OMS. While, the initiative survived transition, a website: http://gyanvigyansarita.inhas been launched. It contains under its**Menu: Publication>e-Bulletins,** and>**Mentors' Manual.** You may like to read them.*

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 at **Involvement**, above, to make the mission more purposeful and reachable to target children.

Coordinator's Views

I Am Not alone

Every action is a matter of an individual's choice arising out of thought process, a culmination of the past that was lived. Therefore, none else is responsible for present and has to be happily either accepted, or corrected if future course is to be changed. Despite, there are moments of deep discontentment when despite selfless efforts, satisfaction is completely out of sight. At such moments poem "Ekla Chalo re...." by Gurudev Rabindranath Tagore, inspirational quotes of Abraham Lincoln, Swami Vivekananda, many social reformers and great statesman are good to catalyze fire to resume efforts, without loss of faith in self, even in a state of loneliness. But, this stupid mind is stubborn, it aggravates by repetitive poking - why should I be alone? Am I to walk it alone? How long to keep walking alone? Human, as a social creature, being alone is most haunting experience. This has prompted an introspection of illusion of loneliness on a mission, during travelling, or staying, when a companion is most desired. This article is manifestation of the introspection.

Birth of every child is a consequence of act of consent or dissent of biological parents. A child grows in mother's womb and is nurtured by her directly. Many others, part of the support system, indirectly nurture a child until it becomes an integral part of the socio-economic order prevalent in the environment. This support system has its own regulatory nature where each player performs within the known freedom and constraints, called मर्यादा (Maryada). Any breach of maryada causes imbalance in the eco-system. Such imbalances cause perturbations in the system which are followed by stabilization process, during which disturbance energy is either absorbed or dissipated through necessary changes in it.

Nevertheless, an egoist like me never loses an opportunity to proclaim as maker of self-destiny. Occasionally, I also choose to humble down with generous gestures support of persons around, in my accomplishments. It is quite perplexing to notice paradoxical attitudes within myself.

Society and humanity despite all adversaries have survived, rather grown. It is due to an element of goodness. Goodness is like nectar which has enormous capacity to neutralize venom of evils. But, being a worldly person, neither a saint nor God, *is it affordable for me to keep pardoning all evils? Is it possible by sacrifices to transform all evils into good?*

I am inclined to believe that theses perplexing questions are in mind of every other person. This must have prompted Sant Kabeer. a candid and out spoken thinker to say "दुःख में सुमिरन करें, सुख में करे न कोय | जो में सुमिरन करे, तो दुःख काहे होय || " (Dukh main sumiran save kare, Sukh main kare na koya; Jo Sukh main sumiran kare, To dukh kahe hoye - meaning 'While in trouble everyone remembers God, why would trouble come in if God is remembered in good times). Well, this is a believers' perspective. It is also believed to be प्रालब्ध (Pralabdh resultant of all prior deeds) and is accepted across all religions. But, an atheist perspective prompts to explore shortcomings in an action that have caused an outcome contrary to expectations, despite well intended, planned, organized efforts without sense of guilt in respect of commitment and sincerity. The introspection converges to a believers' perspective "As you sow, so shall you reap". It is a domain of metaphysics where thought energy also creates reaction as per Newton's Laws of Motion (NLM). Momentarily, one may find to be a gainer while pursuing vested or ill conceived efforts, but life is in totality and not in tits and bits; everyone has to face consequences of his actions in due course.

But, can there be a third perspective on the miseries. It is derived from evolution of life on earth in its present form, a complex dynamics, bio-chemistry, which is governed by survival instinct promulgated by Charles Darwin in his "theory of evolution". Honestly, compulsions of survival on a worldly person keeps him attached to expectations while engaging in any work. This causes deviation from the essence of निष्काम कर्मयोग (Nishkam Karmayog- means selfless working). The whole socio-economic order works on the principle of returns on investment (ROI). Every person, being a psychological creature, is influenced by gain and loss, appreciation or acceptance on success, and criticism or rejection on setback or failures. But, choosing a path of reform is a result of continuous and consistent thought process and actions. which is in no way different from तपस्या (Tapasya – meaning austerity). Tapsya, at its climax, starts radiating

energy, assimilated in the process, in the form of peace seven innate virtues - love, bliss, purity, power, knowledge and happiness. At this stage, pleasure and solace of being able to do good for others, spins off feeling of loneliness, if any. These virtues are prevalent in every spiritual soul with a degree of degree and keep changing with the order of spiritual attainment and its pursuit.

Socio-economic reforms require collective efforts. None, howsoever omnipotent, can alone bring in the reforms. Spirituality helps to catalyze the process of reform. In the process, despite agreement on need of reform, thinking minds might disagree on mode, means and priority. Such disagreements among inspired people drive them to arrive at a more purposeful engagement in the process. Spirit of agreeing to disagree for betterment requires care to shield it from aberrations arising out of subjectivity. Commitment of persons engaged in this kind of mission depends upon their level of inspiration and motivation which has been analyzed in this column in bulletin dt 1st June'18 on its page 8-10.

Philosophy, nature and practices of Gyan Vigyan Sarita (GVS) have been explicitly brought out in its website. It is a small group of compassionate persons working on non-organizational, non-remunerative, non-commercial and non-political basis. During a period of last Six years of operation, it has passed through multiple phases. Despite, survival of the initiative, with stronger commitment, is a result of synergy of spiritual souls around us.

In pursuit of such initiatives there would be persons coming across whose motivational level might put them on non-returnable trajectory. Despite, the interaction would create a mutual reaction in the thought process for reconsideration on cause and effect. It might cause departure of some inspired persons; if at all it occurs there would be reunion, in due course, with a stronger cohesion. Motivated persons, if revert back their cohesion catalyzed by penance, shall be much stronger. Their synergy has a potential to attracts stray persons around. Story of Rishi Balmiki is an excellent example conveying this human dynamics.

Practicing an inspired mission generally calls for an aggressive persuasion. The level of aggression needs to be regulated with degree of hardening in self-conviction that the other person has undergone. This persuasion is more a matter of transforming persons, before their induction into the pursuit of reform. Such transformations are a necessity to create a larger synergy needed for the mammoth reform.

GVS has evolved a proposition Interactive Online Mentoring Sessions (IOMS) to impart quality education to unprivileged children. In this initiative, education is just not about grooming competence to compete among unprivileged children. It is about inculcating human values of coexistence in a spiritual, not religious, by way of education. Requirement of resources in IOMS is so meager that more than often, the group of GVS come across - *Why do we not meet it alone? Why do we expect others to collectively complement it?* The manner in which IOMS aims at bringing in social reform through education, it necessarily requires collectively complementing of efforts by accomplished persons. Evolution of financial model Zero-Fund-&-Zero-Asset (ZFZA) is a deliberate decision to induce among elites a coherence in their efforts with a sense of Personal Social Responsibility (PSR). Educational disparity, qualitatively and quantitatively, is already so wide that it calls for a concerted efforts to democratize education . This gap cannot be abridged with either window dressing or a patch work. It is an opportunity for all, especially those who can make a difference, to play their due role.

This thought process is with full knowledge of the fact that elites are fewer than unprivileged, among the elites persons inspired with PSR are more scarce. This gap was viewed by Karl Marx as cause of class-conflict. Using his dialectical thought process, an alternative way is seen from a spiritual perspective. It is neither a compromise nor arising out of helplessness, rather it seen as a miracle of embodiment of seven innate virtues. This requires dissemination of candid views straight, logically but, with love and compassion to explore possibilities and potential of pro-action. This is essential to leave behind legacy for beloved descendents of each of us, and lend them an era to - grow while competing, coexist without conflicts, in peace without struggle or war, and pro-act without complacence. This will lead to optimization of synergy, the essence of coexistence, instead of spilling it away in conflicts. It is duty of an inspired person on such a mission to disseminate his thought process to all around; it is neither an advertisement, nor a self-proclamation. It is essential to ensure that none of the co-passionate person is left-out, because of ignorance of such an initiative which is within his access.

Integrated persuasion of efforts, at times due unwillingness of others to collectively complement for the cause, might be questionable on the scale of good or bad. These two are relative notions and is left to the judgment of impartial persons; which is very difficult to find. Discrimination between good and bad leads one into domain of theology, morality and socioeconomic ethics. These three domains are not my cup-of-tea. But, being an entity in the system it can be viewed from common sense and experiences.

Bad is that where gains achieved out of an act are disproportionate to the efforts. It's corollary is in inflicting harm, damage, torture or loss to the subject disproportionate to the injury or threat caused by him to the eco-system. This act could be intentional for survival or out of ignorance. The mode of correction depends upon socioeconomic ethics prevalent in the society, which is dynamic.

In predator stage pursuit of survival compulsions phrased as 'might is right'. Growth of social order led to rules and norms of justice. Experiences of disparity prompted contemporary elites to evolve principles of natural justice, caring and sharing, coexistence and governance. Violation of the principles of natural justice, on predator norms, beyond limits of social tolerance, a sociological disorder erupts. Results of such eruptions are volcanic coupled with lot of destruction.

Despite, there is something absolute, and that is the need of coexistence; not for immediate future, rather for distant future in progression. Every act is like a force and is bound to cause a change. If the act is towards creating a stable coexistence, it is good. But, resistance to change is a natural coupling and has got to be accepted as an integral part of the process.

Going further, every act can be classified into one of - reactive, passive or proactive. If an act is an outcome of motivation it is reactive. An act performed in an impulsive manner out of survival instinct without pre-thought it is passive. And an act pre-conceived and performed out of inspiration it is proactive.

An initiative for a social reform is all about proactive inspiration, which is none's personal propriety. It, therefore, has to be open to all to know, to think, to analyze and then to add, modify or take-away either to pro-act or to collectively complement for the larger good. There is no place for competition in it. Elites, who can create a bigger difference, have a bigger role to play. Every individual understands well reactions arising out of actions. Coercive effects of actions are dependent upon the degree of inspiration or motivation behind it. All that is needed is to accept the ground reality, to wake up, to arise and to feel inspired to work for the larger good. This is the only way of undoing the damage that has occurred to the social coexistence, for whatever reason.

Social order is an outcome of collective wisdom. Nevertheless, every social order had a beginning in thought process of either an individual or a small group of individuals. Such thought process gains momentum only when it is pursued with full conviction, sincerity, honesty and is full of inspiration and preparedness to accept its aftermath as a natural consequence. There are instances when one, in his lifetime, is not able to observe his values and efforts seeing light of the day. *This reminds story of an old lean-and-thin man who kept planting trees so that it would give shade in sunny days to unknown passersby and fruits to a unknown hungry men.*

At times we confront a dilemma that - *are we responsible for obstructing passage of social reform by sticking to our approach arising out of ZFZA? Is it wrong to assert reciprocation from promoters and facilitators in furtherance of the initiative?* This initiative is not a pacification drive where logic of convenience, vested interests and impact on good will should prevail. As a researcher and inspired initiator the primary role is to take a thought, live it and perpetuate it to the extent it is right, and correct wherever need of it is felt. It is not acting like a lawyer who argues righteousness of his client on technical ground, despite full knowledge of the guilt. It is also not like preaching or giving sermons to widen the empire and following. Nor it is a political drive where mere appeasement of polity is primary. It does require to disseminate facts with openness to resolution of stalemate, if it occurs, through a solution which feasible and sustainable for coexistence.

It is with this consciousness that in ZFZA model clearly outlines needs of provide infrastructure, operational overheads and their up-gradation, as and when required, by promoters and facilitators; it is a prerequisite for implementation of IOMS. GVS team is committed to mentor target students in letter and spirit. Success of IOMS is based on premise that constituent of system complies with it's maryada. It requires enormous persuasion, patience, efforts and energy to reach a stage of acceptance of IOMS and attain its operational stability. Once tipping point is reached, the whole process of social reform through

education will become self-propelling. In this pursuit seven innate of spirituality are considered greatest virtues.

With general election down the line, momentum is being gained in respect of discussions on exercising franchise in election for right candidate rather than for party. Likewise, there are proponents of गठबंधन की राजनीति (politicizing groups), where various socio-economic groups organize themselves and collectively exercise their franchise to press their socio-economic demands. But, *is it a democracy? Is it not close to mobocracy?* Any act that creates a divide among people leads deformation of the socioeconomic order. Democracy is individual-collectivism where polity rises to a level where every individual exercises its franchise to the best of its wisdom. This is the reason secret ballot is practiced. Democracy is a collective commitment for a reform for a better socio-economic order. In this kind of democracy wise and considered decision of every individual is essential. It has to be based on answers found by them to some basic question questions - *who is right? Degree of consensus among right person? Agenda of right persons? Are right persons in agreement to collectively complement each other for a right cause?*

Answers to above questions, though inevitable, are extremely tough, especially in highly unstable socioeconomic scenario. This is where collective wisdom plays an important role. It necessitates democratization of education to bridge gap among the polity in respect of proficiency with socio-economic awareness. Governance cannot be an individual's responsibility, this is where role political parties comprising of wise-men with high sense of PSR becomes rudimentary. But, parliamentarian who fail to perform their role as people's representative in becoming a part of a solutions, are part of problem, need to be viewed accordingly. Such parliamentarians, be in government or in opposition, can never appreciate the need of social reform through education; they would rather see it as self-deceptive. Therefore, polity has to rise above, on scale of ideology, duty and responsibility with committed inspiration to evolve a corrective socio-economic order. This makes this initiative and like ones fundamental to the democracy. *Emergence of spiritual thinkers and Gurus like Chanakya is a phenomenon, with an optimism that each one of us to grow with these virtues.*

Summary: *There is an African proverb – 'If you want to go fast, go alone.; if you want to go far, go together'. Coexistence is a far reaching necessity; therefore, initiation of social reforms through education inclusive of virtues. It should not be delayed anymore. This reform cannot be achieved alone, we have to collectively complement each other, and elites have bigger role to play with a sense of PSR; we need to reciprocate to the society for we have received.. We can work collectively to avoid another disaster of class-conflict, a proposition in Marxism, which has been rejected by the world. Proactive elites through inspirational initiative and spiritual virtues can bring in a change desirable for larger good, with peace and tranquility. It will help to leave behind them a legacy of sustainable coexistence of society, and with nature, a manifestation of spirituality.*

We have never felt alone in this initiative, and wait for more to know it, modify it, and implement with full autonomy for perpetuation in times ahead, legacy worth planting.

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Admiral Grace Murray Hopper, the first lady admiral US Navy was a self actualized person who practiced what she administered "*A ship in harbour is safe, but that is not what ships are built for. Go ahead! Take risks! There is no shame in saying sorry, if you went wrong.*"

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Religion and Spirituality

A wise man was once asked to explain the difference between Religion and Spirituality. His response was profound:

- *Religion is not just one, there are many.*
- *Spirituality is one.*

- *Religion is for those who sleep.*
- *Spirituality is for those who are awake.*

- *Religion is for those who need someone to tell them what to do and want to be guided.*
- *Spirituality is for those who pay attention to their inner voice.*

- *Religion has a set of dogmatic rules.*
- *Spirituality invites us to reason about everything, to question everything.*

- *Religion threatens and frightens.*
- *Spirituality gives inner peace.*

- *Religion speaks of sin and guilt.*
- *Spirituality says, "learn from an error".*

- *Religion represses everything which is false.*
- *Spirituality transcends everything, it brings you closer to your truth!*

- *Religion speaks of a God; It is not God.*
- *Spirituality is everything and therefore, it is in God.*

- *Religion invents.*
- *Spirituality finds.*

- *Religion does not tolerate any question.*
- *Spirituality questions everything.*

- *Religion is human. It is an organization with rules made by men.*
- *Spirituality is Divine, without human rules.*

- *Religion is the cause of divisions.*
- *Spirituality unites.*

- *Religion is looking for you to believe.*
- *Spirituality you have to look for it to believe.*

- *Religion follows the concepts of a sacred book.*
- *Spirituality seeks the sacred in all books.*

Religion feeds on fear.
- *Spirituality feeds on trust and faith.*

- *Religion lives in thought.*
- *Spirituality lives in Inner Consciousness.*

- *Religion deals with performing rituals.*
- *Spirituality has to do with the Inner Self.*

- *Religion feeds the ego.*
- *Spirituality drives to transcend beyond.*

- *Religion makes us renounce the world to follow a God.*
- *Spirituality makes us live in God, without renouncing our existing lives.*

- *Religion is a cult.*
- *Spirituality is inner meditation.*

- *Religion fills us with dreams of glory in paradise.*
- *Spirituality makes us live the glory and paradise on earth.*

- *Religion lives in the past and in the future.*
- *Spirituality lives in the present.*

- *Religion creates cloisters in our memory.*
- *Spirituality liberates our Consciousness.*

- *Religion makes us believe in eternal life.*
- *Spirituality makes us aware of Eternal Life.*

- *Religion promises life after death.*
- *Spirituality is to find God in our interior during the current life before death.*

-We are not human beings, who go through a spiritual experience.

-We are spiritual beings, who go through a human experience

धर्म अधर्म !

निरंजन धुलेकर

..और फिर स्वर्ग में विष्णु जी ने सभी से पूछना शुरू किया कि महाभारत से उन्होंने क्या सीख ली ..

धृतराष्ट्र ने कहा, पुत्रमोह कितना विनाशकारक होता है , मैं राजधर्म पूरी तरह से भूल गया , जो कुल घातक सिद्ध हुआ !

गांधारी ने कहा , मुझे तो पति की आँखे बन कर उन्हें सत्य से परिचित करवाना चाहिए था ,पर मैं तो खुद ही आँखों पर पट्टी बांध बैठी और उनके पुत्रमोह में शामिल हो कर अधर्मी हो गयी ।

दुर्योधन बोला , राजमोह ने मुझे अंधा कर दिया और स्त्री का सम्मान करना भी मैं भूल गया ,फलस्वरूप राज्य और कुल का नाशक सिद्ध हुआ । मैं भी अधर्मी !

कर्ण ने कहा, अधर्मी मित्र का साथ देने वाला मैं भी अधर्मी । युद्ध में होते अधर्म छल कपट को अनदेखा करता रहा , मेरा अंत भी वैसा ही हुआ !

शकुनि ने कहा , मैंने भांजे के मोह में अधर्म और छल की इच्छा से द्यूत क्रीड़ा का सहारा ले कर कुचक्र रचा उसकी वजह से सभी मृत्यु को प्राप्त हुए , मैं भी अधर्मी ।

पांडवों की तरफ से युधिष्ठिर ने कहा, अधर्मी के साथ द्यूत क्रीड़ा की और पत्नी का अपमान , जुए की हार की दुहाई दे कर हम पांचों ने सह कर , घोर अधर्म किया ।

भीष्म पितामह ने कहा , मुझे प्रतिज्ञा का सही अर्थ पता चला ! मैंने प्रतिज्ञा को धर्म की वेदी पर स्वाहा कर दिया , अधर्म का साथ दिया !

कुंती ने कहा ,मैंने पत्नि का बंटवारा पाँच बेटों में करने का अधर्म किया । कर्ण को मुझे उसका सही स्थान देना चाहिए था ,सत्य स्वीकारना चाहिए था , मैंने भी धर्म का पालन नही किया ।

अंत मे द्रौपदी ने कहा , मुझे स्वयंवर में महा प्रतापी अर्जुन ने अपने पराक्रम से पत्नी बनाया था और उसी समय मैंने उन्हें ही अपना पति बड़े अभिमान से स्वीकार किया अतः मात्र उनके साथ ही रहना मेरा अधिकार भी था और कर्तव्य भी । .

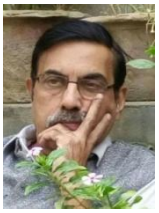
..मुझे माता कुंती के निर्णय पर मूक नही रहना चाहिए था ! उसी तरह बाकी के चार पांडवों , जिनके लिए स्वयवर के तुरंत बाद मैं पुत्री और मां का स्थान ले चुकी थी ,को मुझे पत्नी स्वीकारने में ज़रा भी लज्जा नही आयी , चारो ने अधर्म किया ।

अंत मे विष्णु ने कहा , 'मुझे पता था कि अधर्म आचरण की परिणीति महाभारत में होगी ,तभी तो अवतार ले कर धर्म के लिए आना पड़ा । मैं भू लोक में गीता ज्ञान छोड़ आया था परन्तु ,लगता है उस पर न चलने का अधर्म चरम पर है ! वत्स बहुत कष्टदायक होता है अवतार ले कर मृत्य लोक में आना , पर लगता है मुझे ये कष्ट उठाने का समय निकट आ रहा है ।

ये सब माताराणी लक्ष्मी जी सुन रहीं थी !

उन्होंने कहा , " प्रभु ,मैं आप की राधा ,आपकी आत्मा ! इस बार ब्रज में मुझे अकेला, रोता , बिलखता छोड़ कर जाने का अधर्म में आपको नही करने दूँगी "

प्रभु के मुह से निकल गया , " तथास्तु " .



लेखक एक सेवानिवृत्त बैंक अधिकारी है | आपने गोविन्द वल्लभ पंत विश्वविद्यालय के कृषि विधा के स्नातक है, तत्पश्चात समाजशास्त्र में स्नातकोत्तर की उपाधि ग्रहण की | आपको माइक्रो -फिनान्सिंग क्षेत्र में वृहत अनुभव है | सामाजिक पर्यवेक्ष में चिन्तन एवं लेखन आपकी विशेष रूचि है |

e-Mail ID: pekushekhu@gmail.com

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अंदाज ए बयां

अखबार क्या सिर्फ पढ़ा जाता है, जो नेट से काम चल जाये?

समीर लाल 'समीर'

तिवारीजी के साथ आज हम चाय की दुकान पर बैठे थे, तिवारीजी बातूनी आदमी और हम चुप रहने वाले , हमने अखबार उठा लिया और पढ़ने लगे.मगर तिवारीजी. वो कहाँ किसीको चुप रहने दें.कहने लगे 'का भाई जी, टीवी , मोबाईल, नेट के जमाने मे भी आप आर्ट फ़िलम की तरह अखबारे में घुसे रहते हैं, कभी मौर्डनियाईयेगा कि नहीं ? अख़बारों का अब भी कोई मतलब है क्या?'

बस, उनके ऐसे ही प्रश्न हमें बर्दाश्त नहीं होते तो हम कहे कि तिवारीजी, मतलब काहे नहीं है जी अखबार का ? यात्रा करना बिल्कुले छोड़ दिये का?चप्पल काहे में लपेट के धरियेगा, कपड़ों के बीच वी आई पी सूटकेस में? और जानिये कि अगर रेल(जैसा कि हमेशा होता है), विलम्ब से चल रही हो और पूरा स्टेशन यात्रियों से खचाखच भरा हो , तब बैठियेगा काहे पर?कि खड़े खड़े ही आठ घंटा गुजार देंगे?भीड़ एसन ही तो लग नहीं गई होगी ?आये दिन की पार्टी रैली में से एक यह भी है. सब दिल्ली जायेंगे. अब गई आपकी रिज़र्व सीट भी. उनसे झगड़ियेगा? गुंडा लोगों से..अरे नहीं नहीं, नेता लोगों से? वैसे तो एक ही बात है. तब काहे पर बैठ कर सफर करेंगे? यही अखबार न काम आयेगा. बोलिए?

चलिए, नहीं जाईये कहीं घूमने फिरने.घर में ही गतियाये किताबें पढ़ते रहिये तो आले में बिना अखबार बिछाये किताबें सजाईयेगा ? बताईये-इसका कोई आल्टरनेट है? और फिर वो किताब पर तो जिल्द भी इसी से न चढ़ाते हैं कि भूरा पन्ना खरीद के लाते हैं?

गरमी का हालत नहीं देखे हैं का , तिवारीजी? अभी करंट चला जाएगा तब पढ़ते रहियेगा किताब. बता दे रहे हैंकि तब यही अखबार ही काम आयेगा पंखा झलने के.

हमरे गांव की नुक्कड़ पर गुमटी वाला तो इसी की पूँगी बना कर चना/चबेना बेचता है सदियों से. काहे गरीब के पेट का ख्याल नहीं आया आपको? चलिए, न आया होगा इतना संवेदनशील हृदय नहीं होगा. मरने दिजिये उसको भी भूखा. जब चना उगाने वालों को मरने दिये सब लोग , किसी के कान में जूं तक नहीं रेंगी तो इन बेचने वालों की क्या बिसात. इसी अखबार में ही तो छपा थाकि कितने किसान आत्महत्या कर लिए थे ? बताईये जरा कितने थे? टीवी न्यूज तो रिवाईंड नहीं न कर पायेंगे मगर पुराना अखबार तो बता ही देगा, जरा खोजिये तो.

जाने दिजिये, कहाँ मन खट्टा करियेगा मगर वो छुटकु तो घर में है न.जरा उसकी अम्मा से पूछियेगा कि कितने काम आता है अखबार. कितने डायपर घर में खराब करियेगा. गवैंठी शहरी लेखक, लिख लिख के और कविता गा कर टाटा बिड़ला तो नहिये हो जायेंगे. फिर कैसे अफोर्ड करियेगा? दो जून की रोटी आ रही है लिख लिख कर , इतना ही तरक्की लेखक के लिए एतिहासिक मानिये, कम से कम हिन्दी में और जरा ये भी पूछिएगा कि सिगड़ी काहे से जलाएगी?और वो महंगावाला साड़ी रेशमी के बीच में का धरती है?कभी देखे हैं? और कभी ड्रायक्लीन/प्रेस को कपड़ा दिए है का? वो धोबी का रखता है कपड़ा का बीच में ? और जो कभी पिकनिक-विकनिक गए हो तो ये तो जानते ही होंगे कि काहे में खाए थे पूड़ी-सब्जी और जो पानी नहीं था तो हाथ भी तो साफ़ करे ही होंगे न. अब कहिए, अखबारों का कोई मतलब है कि नहीं?

अच्छा ये बताईये तिवारीजी, उस रोज जब आप राधेश्याम जी के पिता जी की अर्थी के संग मुँह लटकाये गमगीन मरघटाई चले जा रहे थे, तो कहाँ से जाने थेकि उनके पिता जी गुजर गये. अखबार से ही न कि कोई लाऊड स्पीकर पर घोषणा हुई थी ? या जी टी वी वाला दिखाया था ?जानते तो हैं आप कि जाना कितना जरुरी है, आप नहीं जायेंगे तो ऐसा हादसा सब के साथ होना है , कभी आप के साथ भी होगा तो क्या अकेले ढोकर ले जाईयेगा खुद को? या चलकर जाइयेगा? बिना अखबार पढ़े तो न जान पाईयेगा कि शहर में कब कौन पहचान का बैकुंठ के राजमार्ग पर चल पड़ा. कभी पुण्य तिथि मिस करियेगा तो कभी तेहरवीं. अकबका कर बस मुँह-बाये हाय हाय करते रहियेगा कि हम तो जान ही नहीं पाये.

आप सिनेमा भी बड़े शौक से देखते हैं. तब बताईये कि कहाँ देखियेगा कि कौन सिनेमा कहाँ खेला जा रहा है. टॉकिज टॉकिज तो नहिये घूमियेगा अपनी खटारा स्कूटर लेकर बीबी को बैठाये.

किसी को हम तो खैर नहीं बतायेंगे आपके बारे में मगर आप तो हमें बता ही दिजिये कि सब कर लेंगे मगर सट्टे का नम्बर कहाँ से

मिलायेंगे? हम तो सुने हैं कि पिछले ३० दिन के नम्बर से आप चार्ट बना कर अगले दिन का बड़ा सिद्ध नम्बर निकालते हैं, उसका क्या?

वैसे आपको बता देते है कि ऐसा किसी प्रिंट मिडिया के पत्रकार से मत कह दिजियेगा. उनको बड़ी ठेस पहुँचेगी. आप क्या समझते हैं कि कहीं और वो क्लर्की कर लेंगे. पगार तो बराबर की पा ही जायेंगे मगर वो जो पुलिस और सरकारी अधिकारियों को चमका कर गठरी पाते थे वो क्या आप देंगे ? अरे, खुद का तो ठिकाना नहीं, उनको क्या दिजियेगा ? उत्ती मोटी गठरी देने लायक जो आप होते तो ऐसी बात करते भला?

एक बात और बतायें तिवारीजी, कभी किसी मध्यम वर्गीय मानस से पूछियेगा. वो भले ही १५० रुपया अखबार खरीदने में खर्च कर देता हो महिने भर में मगर छः महिने बाद जब उसे रद्दी वाले को झीक झीक कर के बेच कर ६० रुपये पाता है , उस वक्त उसको जिस आलोकिक सुख की अनुभूति होती है ? वो अद्वितीय है. अहहा!! आनन्दम आनन्दम!! क्या उसका यह जरा सा सुख भी छीन कर ही मानियेगा?

चौराहा सूना करवाईयेगा क्या? आधा लोग तो चाय-पान की दुकान पर सुबह इक्कठा ही इसलिए होता है कि फ्री का अखबार पढ़ लिया जायेगा. एक पन्ना तू , एक मैं और फिर बदल कर. फिर उस पर चर्चा. कितना अच्छा लगता है चहल पहल देखे है ? मगर आप कहाँ बर्दाश्त कर पा रहे हैं. न खुद रौनक पैदा करते है , न कौनो रौनक बचे रहने देना चाहते हैं.

कभी सोचे है कि बड़े सरकारी अधिकारी दफ्तर जा कर क्या करेंगे अगर अखबार नहीं आयेगा? मख्खी मारेंगे क्या? मख्खी मारने की तनख्वाह मिलती है भला?

और फिर जरा ऊँचा दिखने की आपकी ख्वाहिश तो जाने कबकी मर गई है. मरी क्या , थी ही नहीं मगर जिनमें है , उनको तो अंग्रजी का फायनेनशियल टाईम पढ़ते पढ़ते पब्लिक पलेस में जगह जगह अंडरलाईन करने दिजिये. उनकी अभिजात्यता से भी कोई दुश्मनी है क्या? वो क्या बिगाड़े हैं आपका?

क्या क्या बताया जाये आपको तिवारीजी, सारे नेता लोगों की रैली में चार ठो लोग इक्कठा हो जायें बिना अखबार के तो बहुत बड़ी बात मानियेगा. कहिये तो लिख कर दे दें.

अच्छा तिवारीजी, जरा गंभीरता से सोचियेगा कभी कि जवान बिटिया के लिए लड़का तलाशते असफल थका हारा मजबूर मध्यमवर्गीय बाप अपनी माँ और बीबी के ताने या फिर बेटे की स्कूल की बड़ी फीस चुकाने के बाद खाली जेब लिए अपने बेटे से नये फैशन को वाहियात बताते नई जिन्स के लिए नकारता , इसी अखबार में तो मुँह छिपा कर अपनी हताशा और खीज को ढांक अपने मुखिया होने की रक्षा करता है.

ये वो ही अखबार है जो हर भिनसारे दुनिया भर के बड़े बड़े दुखों को मुख्य पृष्ट पर छाप कर लोगों को अहसास दिलाता है कि तुम्हारा दुख कितना छोटा है और उन्हें हौसला देता है अपने दुखों को भूल एक और दिन हिम्मत से जीने का.

कितनी बड़ी सामाजिक जिम्मेदारी निभाता है हमारा यह अखबार.

यह भला कभी भी अपनी प्रासंगिगता खो सकता है?

आप नहीं न समझ पायेंगे!!! तिवारीजी!! आप तो चाय पिजिये!

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। ई-मेल: sameer.lal@gmail.com

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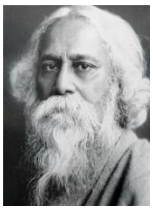
যদি তোর ডাক শুনে কেউ না আসে



If no-one heeds your call - then walk alone

যদি তোর ডাক শুনে কেউ না আসে তবে একলা চলো রে।
একলা চলো, একলা চলো, একলা চলো, একলা চলো রে॥

যদি কেউ কথা না কয়, ওরে ওরে ও অভাগা,
যদি সবাই থাকে মুখ ফিরায়ে সবাই করে ভয়-

তবে পরান খুলে
ও তুই মুখ ফুটে তোর মনের কথা একলা বলো রে॥

যদি সবাই ফিরে যায় ,ওরে ওরে ও অভাগা,
যদি গহন পথে যাবার কালে কেউ ফিরে না চায়-

তবে পথের কাঁটা
ও তুই রক্তমাখা চরণতলে একলা দলো রে॥
যদি আলো না ধরে, ওরে ওরে ও অভাগা,
যদি ঝড়-বাদলে আঁধার রাতে দুয়ার দেয় ঘরে—
তবে বজ্রানলে
আপন বুকের পাঁজর জ্বালিয়ে নিয়ে একলা জ্বলো রে ||

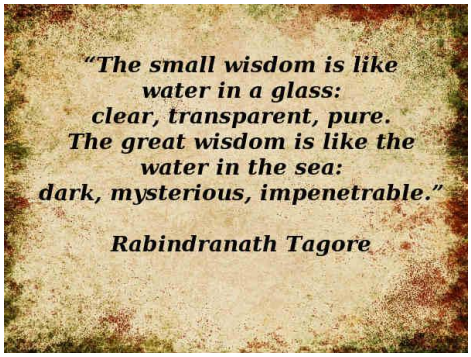
If no-one heeds your call - then walk alone
If no-one speaks (to you), O unlucky one,

if no-one speaks (to you),
If everyone turns away, if everyone fears (to speak),

Then with an open heart without hesitation speak your mind alone
If everyone walks away, O unlucky one, everyone walks away

If no-one looks back towards the (your) unpredictable path,
then with thorn pricked (of the path) bloodied feet,
walk alone If no-one heeds your call –
then walk alone If no-one shines a light (on the path), O unlucky one,

If the dark night brings a storm at the door –
then let the lightening ignite the light in you alone to shine on the path
If no-one heeds your call - then walk alone



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Ayurveda : Healthy Life

Know Ayurveda

Dr. Sangeeta Pahuja

Ayurveda is an ancient medical system which is more than 3000 years old. According to mythyological story Dhanvantri was the first physician to use Ayurveda. Ayurveda texts begins with the accounts of the transmission of medical knowledge from the Gods to sages and then to human physicians.Ayurveda is as old as life on this earth.

Dhanvantri (called as Hindu God of Ayurveda) taught medicine to a group of physicians including Sushruta.

Historically ancient Acharayas of Ayurveda are Ashwini Kumar, Dhanwantri, Divodas, Nakul, Sahdev, Arki, Chaywan, Janak, Buddh, Javal, Jajli, Pael, Karath, Agastaya, Atri, Bhed, Jatukatna, Parashar. Ksheerpaani, Harit, Charak, Sushruta

Ayurveda is made up of two words : 'Ayu' means life and 'Veda' means knowledge.--- i.e. Knowledge of life.

It's not only about how to get rid of diseases by using herbs. It's about how to create a perfect balance between nature and our body.

Principle of Ayurveda is Lस्वस्थस्यस्वास्थ्य रक्षणम,आतुरस्य विकार प्रशमनम्। (pronounced as - Swasthasay swasthay Rakshnam Aaturasaya vikar prashmanam). Meaning of this shloka is " *To keep a healthy person Healthy and to treat the diseased person*." Therefore, it is essential to focus on being Healthy by following Ayurveda.

Usually people visit the doctor when they are sick.Of course it's ok but if we concentrate on not being sick, life will be beautiful. Ayurveda is the path to such wonderful healthy life.

Nature has 5 elements – **(i)** Air—Aakash, **(ii)** Water—Jal, **(iii)** Fire—Agni, **(iv)** Space—Vayu, and **(v)** Earth—Prithvi. These Five elements together are called 'Panchmahabhut'. These elements compose the living and non-living material as well.

Based on Panchmahabhut concept people are distinguished into three categories:

(a) Vata(air+ether or space) -Governs the principle of movement

(b) Pitta(Fire +Earth) - Is the process of transformation or metabolism

(c) Kapha(Water+Earth) - Is responsible for the growth and structure of the body.

The balance of these trienergies keep us healthy and this balance can be maintained by our diet and lifestyle and different Ayurvedic herbs and purification procedures are done(if toxins in the body are abundant, then a cleansing process known as panchkarma is recommended to eliminate these unwanted toxins).

This balance is disturbed by irregular lifestyle, prolonged physical and mental stress, poor dietary habits, incompatible food, misuse of senses.

Definition of Health in Ayurveda is -

सम दोष:,समाग्निशच,समधातुमलक्रिया

प्रसन्नात्मेंद्रिय मन;स्वस्थ इत्यभिधीयते।

Means balanced Vata-Pitta-Kapha(called Tridoshas),The Digestive fire(called Jatharagni in Ayurveda),balanced physiological functions of body(proper functions of saptdhatu-Ras, Rakt-Mansa-Meda-Asthi-Majja-Shukra),proper excretion of toxins, happy soul-senses- mind (Aatma-Indriya-Mana) is health.

Ayurvedic remedies are classifies medicines into eight components:

(i) Kayachikitsa (General medicine),
(ii) Kaumarabhrtya (Paediatrics),
(iii) Shalyatantra (Surgical Techniques),
(iv) Shalakyatantra (ENT),
(v) Bhutvidya (Psychitary or Manorog Chikitsa),
(vi) Agadtantra (Toxicology),
(vii) Rasayantantra (Rejuvenation) and
(viii) Vajikarantantra (Aphrodisiac).

Ayurveda provides guidance about diet and lifestyle to stay healthy, which includes-

- Dincharya (Daily Routine habits)
- Ritucharya (Diet and lifestyle according to season).

By following the diet and lifestyle guidelines one can stay fit and healthy. Children should strictly follow these guidelines to grow into a healthy young.

Know Ayurveda, Follow Ayurveda and Stay Healthy.

Author is an Ayurvedic Medical Practitioner. She did B.A.M.S. from M.D. University, Rohtak. She has consultation centres at Delhi and Noida. She is keenly interested in spiritual, women and social developmental activities. Contact No.: 9953967901,
E-mail - sangeeta.pahuja3@gmail.com

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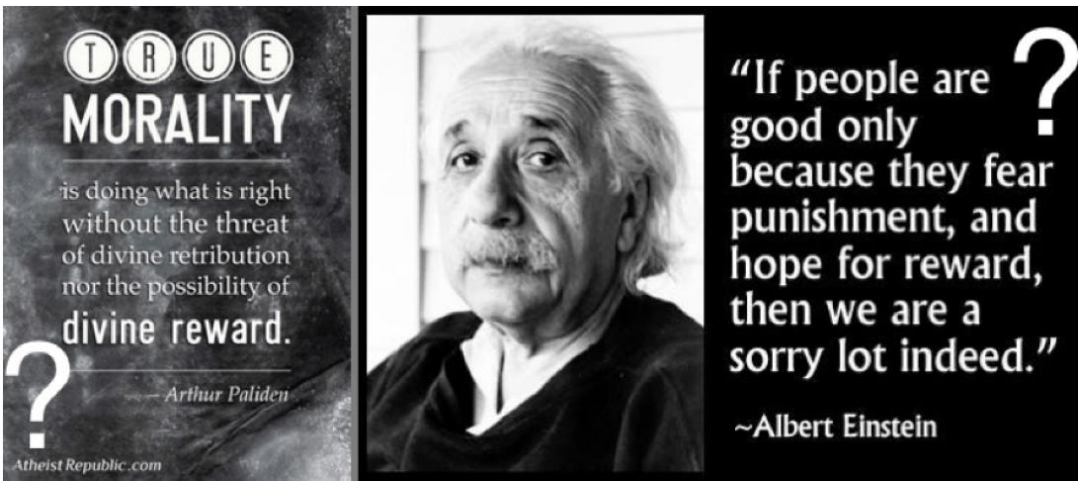

INVITATION FOR CONTRIBUTION OF ARTICLES

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

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

- ***With the start of Second year of operation, we have reached to 8th Quarterly e-Bulletin Gyan-Vigyan Sarita: शिक्षा .***
- ***Theme of the 1st Supplement of 8th Quarterly e-Bulletin dt 1st August'18 is 72th Independence Day of our country.***
- ***And this cycle of monthly supplement sandwitching consecutive Quarterly e-Bulletin Gyan-Vigyan Sarita: शिक्षा is aimed to continue endlessly***

We believe that this monthly supplements to quarterly periodicity of e-Bulletins shall make it possible for our esteemed contributors to make contribution rich in content, diversity and based on their ground level work and/or experiences.

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DO PAY-RENT TO YOUR PARENTS

Priya Tandon

This article is reported to be first published in The Hindustan Times, a leading national daily, and reached us as a WhatsApp forward. In absence of contact details of the author it has not possible seek oermission for its reproduction.. It is believed that, author has consent for its republication seeing her intent to emphatically disseminate need of reform family and values.

A very distressed neighbour shared that he had driven home after a long day at work. As he entered, he saw his wife in bed with fever. She had laid out his dinner on a tray.

Everything was there just as he wanted it. The dal, vegetables, salad, green chutney, papad and pickles... "How caring," he thought, "Even when she is unwell, she finds the strength to do everything for me."

As he sat down to eat, he realised that something was missing. He looked up at his grown up daughter who was watching TV and said, "Beta (child), can you get me my medicine and a glass of water, please?"

She rolled up her eyeballs to show her displeasure at being disturbed, but did the favour nevertheless.

A minute later he realised that salt was missing in the dal.

He said, "Sorry beta, can you please get me some salt?"

She said, "Ufff!" and got the salt but her stomping shoes made it clear that she did not appreciate the disruption.

A few minutes later he said, "Beta ..."

She banged the TV remote on the table and said, "What is it now Dad? How many times will you make me get up? I too am tired; I had a long day at work!"

The man said, "I'm so sorry beta..." Silence prevailed.

The man got up and placed the dishes in the kitchen sink and quietly wiped the tear escaping his eye.

My heart wept... I often wonder; why is it that the youngsters of the so called modern world behave like this? Have we given them too much freedom to express? Have we failed to discipline and give them the right values?

Is it right to treat children as friends? Think of it this way, they have lots of friends. But they have only one set of parents. If they don't do 'parenting', who will?

Today the 'self-esteem' of even a new born or an infant is being talked about; but what about the self-esteem of the parents? Are they supposed to just fan the egos of their children, while the children don't care two hoots about theirs?

Often parents say, "Aajkal ke bachhe sunte kahaan hain (Where will you find obedient children in these times)?" Why?

The other day, we were at a dinner party. All the seats were occupied except for one bean bag. One of our fifty-something friends told his teenaged daughter to move to the bean bag, so that he could sit on the high back chair she occupied.

She said, "Why can't you sit on the bean bag?"

I was zapped; we all knew that the father had a back ailment, and even otherwise... Well!

Later as everyone was taking leave of the host, the same guy realised that he had left his car keys inside. He asked his daughter to go and get them.

"Why can't you go and get them yourself? I am not your maid!"

I looked away in disgust and disbelief. The poor guy had no option but to make light of the situation saying, "Ya, Ya, but Daddy is your eternal servant my princess!"

He went inside to fetch the car keys. This is what our social behaviour has become! Why?

If we need to teach children about self-respect, self-esteem and self-confidence, we also need to tell them that howsoever big and rich and famous they may be, their parents shall always be their parents... children can never be their equals, let alone be their bosses! Remember to Pay-rent - Pay Respect, Empathy, Niceness, and Time!

"The mother is every man's primary wealth. The father is one's wealth. Everyone should cherish and respect their parents. The mother and father may be physically separate, but spiritually they are one. One must love and serve them. An ungrateful person is worse than a beast.

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विचार-मंथन

धाय माँ

सुरेन्द्र कुमार मिश्र

'**माँ** ' शब्द से जिस पवित्र वात्सल्य -प्रेम का अहसास होता है , जिस सुख, शांति, शीतलता का अनुभव होता है , वह संसार के अन्य समबन्धों से नहीं होता। संसार के अनेक धर्मावलम्बियों एवं महापुरुषों ने भगवान के बाद माँ को ही सबसे ऊँचा स्थान दिया है। संसार में माँ का न होना जीवन का सबसे बड़ा अभाव होता है। इसे वही जानता है जिसके सर से माँ का साया उठ गया हो। माँ की छत्रछाया अपनी संतान के लिए सर्दी -गर्मी , आपत्ति-विपत्ति , जीवन के उतार -चढाव व् हर परिस्थिति में अभय प्रदान करती है। माँ की ममता की शीतल छाया , प्रेरणा की शक्ति और साहस का सम्बल प्रदान करती है। माँ अपने अथक प्रयास से अपनी संतान में उत्तम से उत्तम संस्कारों का बीजारोपण करना चाहती है, जो समय आने पर विकसित होकर मानवता के विकास में सहायक सिद्ध हो सके और और स्वस्थ समाज एवं सुदृढ राष्ट्र का निर्माण कर सके। परिवार को नागरिकता की प्रथम पाठशाला कहा गया हैऔर माँ संतान की प्रथम शिक्षिका होती है। अतः माँ का स्थान संसार में सर्वोपरि है।

माँ के त्याग , तपस्या तथा सेवा को बच्चा जल्दी भूल नहीं पाता। संसार के जितने भी संत , धर्मगुरु , उपदेशक, समाज-सेवक , महापुरुष, दार्शनिक हुए हैं उनमें उत्तम से उत्तम संस्कारों का बीजारोपण उनकी माताओं द्वारा ही हुआ। सन्यासी भी संन्यास ग्रहण करते समय माँ से अनुमति लेता है , यह उसके संन्यास -धर्म के लिए आवश्यक होता है। माँ की निःस्वार्थ सेवा और त्याग को , संतान के लिए, भूलना कठिन होता है । अतः माता का त्याग करके गृहत्यागी, बैरागी बनना आसन्न नहीं होता। आदि शंकराचार्य ने बाल्यकाल में ही संन्यास ग्रहण कर लिया था, किन्तु वे अपनी माता को अंत तक भूल नहीं पाए थे। उन्होंने अपनी माँ को यही वचन दिया था की "जब तुम मुझे याद करोगी , तब मैं उपस्थित हो जाऊँगा " | हुआ भी यही कि उनकी माँ ने जीवन के अंतिम क्षणों में अपने पुत्र को याद किया और उनके शरीर छोड़ने के पहले ही आदि शंकराचार्य माँ के पास पहुँच गए। इस प्रकार उन्होंने अपने वचन का पालन किया। इससे माता और संतान के अटूट एवं प्रगाढ़ सम्बन्ध का अनुमान लगाया जा सकता है।

आज के भौतिक युग में यह भी देखने को मिलता है कि बच्चे शिक्षा प्राप्त करके किसी ऊँचे पद पर आसीन हो जाते हैं तो उनकी पहचान उनके स्तर के लोगों में बन जाती है | ऐसी दशा में यदि अशिक्षित माता-पिता साधारण कपडे पहनकर उनके पास चले जाते हैं तो वे अपना अपमान महसूस करते हैं। वे अपने सह-कर्मियों से अपने माता -पिता का परिचय करने में कतराते हैं। इसके विपरीत इसी समाज में ऐसे लोग भी हैं जो अपने संचित संस्कारों के कारण संभ्रांत लोगों क सामने भी अपने माता-पिता के चरण -स्पर्श कर उनका आशीर्वाद लेने व् उनका परिचय कराने में अपना परम सौभाग्य समझते हैं। ऐसे उत्तम संस्कार के लोग माँ के सामान अन्य नारियों का भी सम्मान करते है , तथा उनकी सेवा करने में गर्व का अनुभव करते हैं।

धाय द्वारा किसी बच्चे का पालन पोषण होता है . अर्थात धाय अपना दूध पिलाकर किसी बच्चे को बड़ा करती है तो वह माता कहलाने का अधिकार रखती है। जननी के सामान भले ही उसने बच्चे को जन्म नहीं दिया किन्तु माता के सामान पालन -पोषण करने के कारन वह माता कहलाने का गौरव प्राप्त करती है। इसी प्रकार बच्चे को शिक्षा देने वाली , उसकी रक्षा देले वाली, जीवन को दिशा देनेवाली तथा प्राण -रक्षा करने वाली माताएँ भी धर्म की माताएँ कही गयी हैं। किसी-न-किसी रूप में मातृत्व का भाव रखने वाली नारियाँ माता का गौरवशाली पद पाने का अधिकार रखती हैं।

अंग्रेजी हुकूमत का समय था। उस समय पश्चिम बंगाल की राजधानी कोलकाता (कलकत्ता) के उच्च न्यायालय के दरवाजे पर एक बुढ़िया पहुँची। वह विक्षिप्त सी दिखाई पड़ रही थी . मलिन वस्त्र और नंगे पाँव होने के कारणवह देखने मैं भिखारिन जैसी लग रही थी। उसने जोर -जोर से आवाज लगायी कि मुझे मेरे गुरदास से मिला दो , मुझे मेरे गुरदास से मिला दो ....| उसकी हालत देखकर संतरी उसे भागने लगा। वह बार-बार संतरी से हाथ जोड़कर कह रही थी की भैया मुझे मेरे गुरदास से मिला दो , मुझे उससे मिलने अंदर जाने दो। बुढ़िया के बार -बार अनुनय-विनय के बाद भी संतरी

पर असर नहीं पड़ा और उसने उसे अंदर जाने नहीं दिया। उस समय न्यायाधीश के आसन पर बैठे हुए सर गुरदास किसी मुक़दमे की बहस सुन रहे थे। उन्होंने उस बुढ़िया की आवाज पहचान ली और जैसे ही नजर घुमाई तो दरवाजे के बाहर एक बुढ़िया संतरी के सामने हाथ जोड़े खड़ी दिखाई दी। सर गुरुदास उस बुढ़िया को पहचान ग ए की यह तो वही धाय -माँ है, जिसने मुझे बचपन में अपना दूध पिलाकर बड़ा किया था। सर गुरुदास उसी समय न्यायाधीश का आसान छोड़कर दरवाजे पर आ गए। उन्होंने उस बुढ़िया को माँ कहकर दंडवत प्रणाम किया , जैसे कि मंदिर में देव-मूर्तियों के सामने भक्त-जनों को प्रायः करते हुए देखा जाता है। बुढ़िया ने उसके सर पर हाथ रखके आशीर्वाद देते हुए कहा की "जीते रहो बेटा । सभी उपस्थित लोग आश्चर्य -चकित होकर देख रहे थे कि न्यायाधीश सर गुरदास जी ने बुढ़िया का परिचय देते हुए स्पस्ट कहा की "यह मेरी माता है जिन्होंने मुझे बचपन में दूध पिलाकर पाला था" . बुढ़िया का परिचय देते हुए सर गुरदास को गर्व का अनुभव हो रहा था। इस प्रकार बिछड़े बेटे को माँ मिल गयी और माँ को बेटा मिल गया। इस सुखद अनुभूति का अनुमान ही लगाया जा सकता है। बाद में वे धाय-माँ को घर ले गए। वह बुढ़िया इसके बाद सम्मान पू र्वक जीवन बिताने लगी।

वास्तव में माँ की उपस्थिति में जीवन का बहुत बड़ा आभाव मिट जाता है। दुःख और निराशा के क्षणों में माँ बच्चे का उत्साह बढ़ाती है और ढाल बनकर अपनी संतान की रक्षा करती है। उसके आशीर्वाद में संजीवनी होती है जो हर पल अपनी संतान में नई ऊर्जा भर्ती है , नया उत्साह, नयी उमंगें जगाती रहती है। उम्र बढ़ने पर भी संतान माँ की उपस्थिति में बच्चा बनकर सुख प्राप्त करता है। माँ का वरद-हस्त जिस बच्चे के सर पर हमेशा बना रहता है , वह परम सौभाग्यशाली है। माँ के निधन के बाद बच्चा सचमुच अनाथ हो जाता है।

आज घोर भौतिक युग में एक तरफ आर्थिक सम्पन्नता बढ़ती जा रही है , जीवन में सुख-सुविधाएँ बढाती जा रही हैं, तो दूसरी तरफ नैतिकताऔर जीवन मूल्यों का ह्रास भी होता जा रहा है। यही कारण है की संयुक्त-परिवार प्रथा समाप्तप्राय हो चली है। अति सीमित परिवार 'हम दो, हमारा एक ' प्रचलन बढ़ता जा रहा है। यहाँ तक की अब तो माता-पिता भी किसी-किसी परिवार में भार बनते जा रहे हैं। अंत में वे या घर से बाहर निकाल दिए जाते हैं अथवा अपमान सहते -सहते ऊब जाते हैं , और स्वयं किसी वृद्धाश्रम की शरण ले लेते हैं। स्वतंत्रता एक सीमा तक उचित है , किन्तु जब वह स्वच्छंदता का रूप ग्रहण कर लेती है, तब वह विकृति बन जाती है।

मानव मूल्यों में मानवीय जीवन को कीमती बनाने की अद्भुत -अनंत क्षमता होती है। ये जीवन-मूल्य शाश्वत व्यवहार के रूप में चलते आये हैं। इन जीवन-मूल्यों का निर्माणमानव-विकास के साथ-साथ हुआ है। यदि जीवन मूल्य ह्रास होते -होते बिलकुल समाप्त हो जाएँगे तो सभ्यता भी समाप्त हो जाएगी। मानव-सभ्यता का अंत होने पर मानवता का अंत होना सुनिश्चित है। कोई भी व्यक्ति, परिवार, समाज अथवा राष्ट्र यदि जीवन मूल्यों की पूँजी खो देता है तो भौति क समृद्धि के शिखर पर पहुँच कर भी कंगाल बना रह जाता है , और उसकी स्थिति दयनीय बनी रहती है। भारतीय संस्कृति प्राचीनतम एवं विश्ववंदनीय संस्कृति है। इसे विकृत होने से बचाये रखने के लिए शिक्षा के साथ-साथ उत्तम संस्कारों से भी अपनी संतानों को संस्कारित करना हर भारतीय का नैतिक कर्तव्य है। , तभी हमारी धरोहर -संस्कृति विश्व मानव -समुदाय के लिए अनुकरणीय बनकर वसुधैव -कुटुंबकम धारणा के साथ हमारी पहचान भी अक्षुण्ण बनी रह सकेगी।

इति !

लेखक शिक्षा जगत में सक्रीय रहे। वे हरियाणा राज्य के शिक्षा विभाग में हिंदी के विभागाध्यक्ष के पद से सेवा-निवृत्त हुए। सामजिक एवं नैतिक मूल्यों पर चिंतन, लेखन एवं परिचर्चा आपकी विशेष रूचि है

e-Mail: surendraayan.mishra@gmail.com

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नहीं मानना हार

मृणालिनी घुळे

मां सरस्वती के मंदिर का द्वार
पुन:खुल गया

शुरु हो गया नया सत्र
पंख लगा कर उड़ गए
अवकाश के दिन
और नये सोपान पर

चढ़ गया हर छात्र
पुन: नये जोश, नयी उमंग से
जीतने इस सत्र के संघर्ष को
जो लाएगा जीवन में सबके

नयी उन्नती, नया उत्कर्ष
सहर्ष जुट जाओ
अपने कर्मक्षेत्र में
करो सामना हर मुश्किल का
धैर्य और दृढ़ निश्चय से,
नहीं मानना हार।

कवियत्री एक सामाजिक चिंतक एवं विचारक हैं | आपकी कविताएँ वर्तमान पर्यवेक्ष्य में बुद्धि-जीवियों को उनके सामाजिक उत्तरदायित्व के प्रति उन्हें चिंतन के लिए प्रेरित करती हैं | आपकी लेखनी प्रादेशिक एवं राष्ट्रीय स्तर पर प्रकाशित है|
E-mail: mrinalinighule46@gmail.com

ये जीवन ऐसा हो

डॉ. संगीता पाहुजा

ये जीवन ऐसा हो, ये जीवन वैसा हो।
सबकी चाह, ये जीवन स्वर्ग जैसा हो।

करो कर्म ऐसे की तुम जैसा चाहो,वैसा हो।
जगविदित है,हर एक में बसता है ईश्वर
इसी विश्वास की देरी, फिर जैसा चाहो,वैसा हो।

आत्मविश्वास से ,अपने ब्रह्मरूप को समझने की देरी है,
फिर किसी कार्य,किसी लक्ष्य को पाने में नहीं कोई देरी है।

नर हो या नारी,सबमे ईश्वर बसता है,न कोई अबला,
न कोई असहाय,बस आत्मविश्वास की हेराफेरी है।

फिर जैसा तुम चाहो वैसा हो,
सबका जीवन स्वर्ग जैसा हो।

कवियत्री आयुर्वेदिक चिकित्सक हैं | आपने B.A.M.S. की उपाधि M.D. University, रोहतक से प्राप्त की | आपके दिल्ली एवं नॉएडा में परामर्श केंद्र है | धार्मिक, नारी एवं समाज उत्थान कार्यों में आपकी विशेष रूचि है |
संपर्क: मो. क्र.- 9953967901,
ई-मेल - sangeeta.pahuja3@gmail.com

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Healing Touch

Seema Phatak

Teacher, Educator, Doctor are external agents to provide a healing touch. Nevertheless, with the help of a teacher, educator and at times by doctors, it is helpful to stimulate Yoga in one's daily routine. Accordingly, International Yoga Day in June, National Doctors' Day in July and start of new academic session, creating interaction between students and teacher ,with a fresh vigour, in July makes it a right occasion to dwell on the three topics of relevance to students in particular and all in general.

Yoga Positions (Asanas)- may be practiced at any time of day except within 2-3 hours of having eaten. You can do postures when the body feels stiff, tense, tired or hyped-up. Be aware not to do too many over-stimulating postures just before bedtime. Asanas are best practiced first in your yoga routine, followed by breathing (Pranayama) and then meditation.

Pranayama may be practiced at any time of day except within 2-3 hours after meals. It may be done when tense or tired or when space does not allow room for postures. Pranayama is best practiced straight after asanas without breaking the flow of awareness. Pranayama is a necessary pre-requisite for successful meditation.

Meditation may be done at any time of day when you feel both awake and relaxed. For best results don't do meditation within 2-3 hours of eating, when feeling sleepy, or when mentally "hyped-up".

Yoga Nidra can be done at any time of day, even directly after meals so long as you do not fall asleep in the practice. Don't do Yoga Nidra when you feel tired or sleepy. More will be gained when you are both awake and relaxed.

Place of Practice

- It is best is to have fresh air in a quiet and clean place that suits the concentration and awareness yoga will create.
- Do not practice yoga in direct sunlight or after sun-bathing. Outdoors is OK but avoid cold wind and insects.

Awareness

- Throughout a yoga practices, try to keep your awareness on what you are doing. Don't be concerned with others in the class or outside the room.
- Proceed slowly and carefully. Follow the instructions exactly.
- Never force or strain. Relax briefly between each practice. Remember the golden rule: **"If it's uncomfortable – DON'T"**

Breathing

- Always breathe through the nose both in and out, unless specified otherwise. Remember "Nose for breathing-Mouth for eating".
- If you do have trouble breathing through your nose, practice "Jala Neti" (Nasal Cleansing) or visit a doctor for medical inspection.

Restrictions & Precautions

- There are no age limits either young or old for the practice of yoga. However the application of the techniques will vary according to the abilities of the practitioner. Keep in mind the following.
- Never practice any yoga techniques under the influence of alcohol or mind altering drugs.
- Those with disabilities, severe, acute or chronic medical conditions should consult both with their medical practitioner and their yoga teacher to assess any dangers or difficulties which may arise.
- There are no hard and fast dietary rules necessary to begin the practice of yoga. One does not have to give up smoking, become vegetarian, or be a purist to learn yoga.

Yoga Equipment :While yoga does not require equipment as such, however there are some supplies which you must have to make your practice smooth, comfortable and satisfying

Yoga must be practiced on suitable Yoga Mats. The mat should be such that can help you perform yoga poses, meditation and relaxation postures with equal ease while making you feel good. Click here to read about the only real 3-in-1 yoga mats.

Wear loose comfortable yoga clothing so there there is no restriction around the limbs.

Caution: Remove spectacles, watches or any cumbersome jewelry or ornaments and keep beside you in a yoga pouch. These items may obstruct your postures during Yoga.

National Doctors' Day – 1st July : Doctors spend the precious 20's of their life to understand disease and death. The calling they have chosen remains a matter of challenge and brings with it, higher demand to the task there is at hand. With some diseases like Polio, Diphtheria on the verge of extinction, newer regenerative diseases like Rheumatoid and other Collagen diseases are cropping up. The burden of disease is increasing faster than the understanding of its very nature

The modern day demands that doctors juggle textbooks, journals, patient care, clinical skills, blackberries, nursing calls, egos and much more. In the bargain, they will still struggle to find the meaning of disease deliberation. But it is a matter of extreme courage to undertake the task at hand and to persist aggressively to put efforts to build better patient care.

July 1st marks National Doctors Day. *Health Concern Foundation wishes to extend its greetings to all Doctors on this day*. May this tribe increase for good.

Yoga: World celebrated Fourth International Yoga Day on 21st June'18. It is there relevant to share some thoughts on Yoga.

When to do Yoga?-The very best time to practice yoga is first thing in the morning before breakfast. Upon waking, empty the bowels, shower if you wish, then commence the day with your regime of yoga practices. The second most conductive time is early evening, around sunset.

But is it of course far better to do something at a time of the day which suits one, rather than to miss out by being too rigid or idealistic. Always remember integral yoga is a balanced recipe which maintains: That to get the best from your yoga practice, you should whenever possible, **mix and match the necessary elements of practice** which will improve and enhance your spiritual growth and awareness.

Teacher and Educator- As per web definition- *'Individuals who deliver pre-service and in-service teacher education, including, but not limited to, college and university faculty.'*

I like a teacher who gives you something to take home to think about besides homework.

- LILY TOMLIN

Educator and teacher are two words that are often interchanged wrongly. There is some difference between the two words for that matter. The word 'educator' is used in the sense of 'mentor'. On the other hand, the word 'teacher' is used in the sense of 'trainer' or 'preceptor'. In fact, the word 'educator' is used in the special sense of 'mentor'. This is the main difference between the two words.

The word 'educator' is used mainly as a noun. An educator leaves a permanent impression upon the taught. Many a time the taught considers such a persona that has left a permanent impression upon him as his mentor or 'educator'. It is thus, understood that not all teachers can be called educators. Only such of those teachers who leave a permanent mark in the hearts of the students alone can be called as educators.

On the other hand, a teacher is appointed by the management of a school or a college to teach the lessons that form part of the syllabus for the students of a particular class. He or she is supposed to ward off the doubts in the minds of the students regarding the theory in a particular subject or an art. A teacher works for a salary at the end of the month.

A teacher alone can turn out to be an educator. On the other hand, all educators are natural teachers. It is interesting to note that the word 'educator' has its verbal form in the word 'educate', whereas the word 'teacher' has its verbal form in the word 'teach'. It has its abstract noun in the form 'teaching'. On the other hand, the word 'educator' has is adjectival form in the word 'educating'. These are the differences between the two words.

Author is a M.A., M.Ed. with 12 years of experience as am educator person in private school. Her other areas of interest are nature, arts and crafts

E-mail: seemaphatak68@gmail.com

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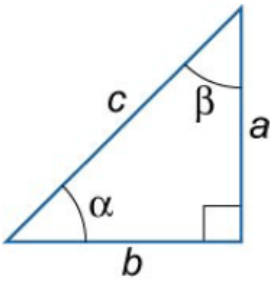
APPENDIX II-B LIST OF STANDARD FORMULAE

Prof. SB Dhar

This article is in continuation of the **Part I** related to the **Important Formulae Of Mathematics**. In this part, the formulae are related to the **Euclid's Plane Geometry & Rene Descartes' Coordinate Geometry**.

1. In a right angled triangle, Base=b, Altitude=a, and Hypotenuse=c



Area= $\frac{1}{2} b \times a$

$\sin\alpha = \frac{a}{c}$

$\cos\alpha = \frac{b}{c}$

$\tan\alpha = \frac{a}{b}$

$\cos ec\alpha = \frac{1}{\sin\alpha}$

$\sec\alpha = \frac{1}{\cos\alpha}$

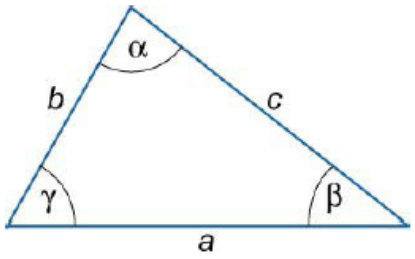
$\cot\alpha = \frac{1}{\tan\alpha}$

Pythagorean Theorem

$a^2 + b^2 = c^2$

2. Area of an **equilateral triangle**= $\frac{\sqrt{3}}{4}(side)^2$ Radius of Circum-cirlce R= $\frac{\sqrt{3}}{3}(side)$

3. In a triangle



$\alpha+\beta+\gamma=180^0$

(a) a+b>c, b+c>a, c+a>b

(b) |a-b| <c, |b-c| <a, |c-a| <b

(c) $\cos\alpha = \frac{b^2 + c^2 - a^2}{2bc}$

(d) $\cos\beta = \frac{a^2 + c^2 - b^2}{2ac}$

(e) $\cos\gamma = \frac{a^2 + b^2 - c^2}{2ab}$

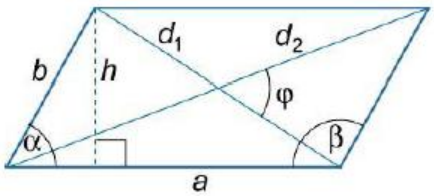
(f) $\frac{\sin\alpha}{a} = \frac{\sin\beta}{b} = \frac{\sin\gamma}{c} = \frac{1}{2R}$

(g) $\sin\frac{\alpha}{2} = \sqrt{\frac{(s-b)(s-c)}{bc}}$ where $s = \frac{a+b+c}{2}$

(h) $\cos\frac{\alpha}{2} = \sqrt{\frac{s(s-a)}{bc}}$

(i) $\tan\frac{\alpha}{2} = \sqrt{\frac{(s-b)(s-c)}{s(s-a)}}$

4. Parallelogram



(a) $\alpha+\beta=180^0$

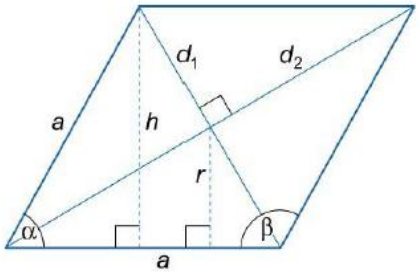
(b) $d_1^2+d_2^2=2(a^2+b^2)$

(c) $h=b\sin\alpha = b\sin\beta$

(d) Area= $\frac{1}{2}d_1d_2\sin\varphi = ab\sin\alpha$

5. Rhombus

Sides of a rhombus=a, Diagonals= d_1, d_2, Altitude=h



$\alpha+\beta=180^0$

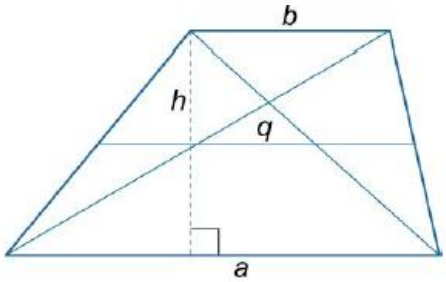
$$d_1^{\,2}+d_2^{\,2}=4a^2$$

$$h=\frac{d_1d_2}{2a}=a\sin\alpha$$

$$r=\frac{h}{2}=\frac{d_1d_2}{4a}$$

Area= $ah=\frac{d_1d_2}{2}=a^2\sin\alpha$

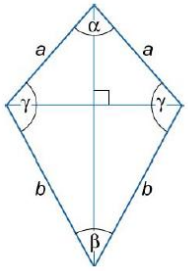
6. Trapezoid



Mid-line q= $\frac{a+b}{2}$

Area= $\frac{a+b}{2}h=qh$

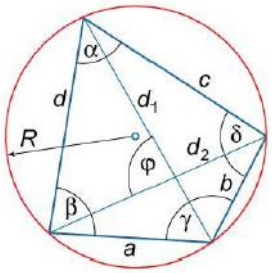
7. Kite



$$\alpha+\beta+2\gamma=360^0$$

Area= $\frac{d_1d_2}{2}$

8. Cyclic Quadrilateral



$$\alpha+\gamma=\beta+\delta=180^0$$

9. Ptolemy's Theorem

$$ac+bd=d_1d_2$$

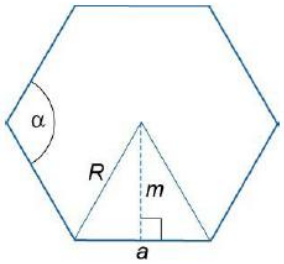
Radius of Circum-circle

R= $\frac{1}{4}\sqrt{\frac{(ac+bd)(ad+bc)(ab+cd)}{(p-a)(p-b))(p-c)(p-d}}$

where $p=\frac{a+b+c+d}{2}$

Area= $\frac{1}{2} d_1 d_2 \sin\varphi = \sqrt{(p-a)(p-b))(p-c)(p-d}$

10. Regular Hexagon



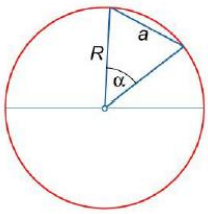
Internal angle = 120^0

$$r = m = \frac{a\sqrt{3}}{2}$$

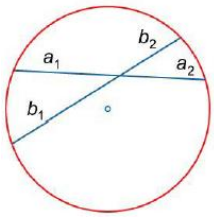
R=a

Area=pr= $\frac{L}{2} r = \frac{a^2 3\sqrt{3}}{2}$

11. Circle

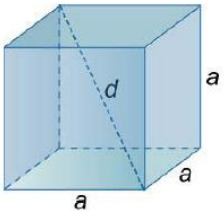


$$a = 2R\sin\frac{\alpha}{2}$$



$$a_1 a_2 = b_1 b_2$$

12. Cube



Diagonal= $a\sqrt{3}$

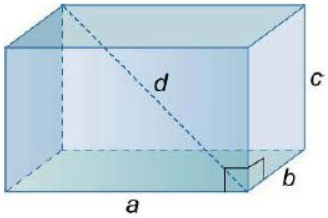
$$r = \frac{a}{2}$$

$$R = \frac{a\sqrt{3}}{2}$$

Area= $6a^2$

Volume=a^3

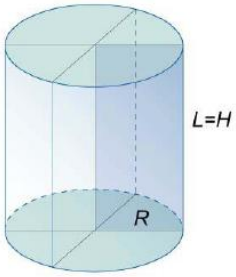
13. Rectangular Parallelepiped



Diagonal= $\sqrt{a^2+b^2+c^2}$, Surface area=2(ab+bc+ca)

Volume=abc

14. Right Circular Cylinder

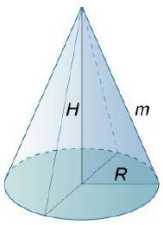


Lateral surface area= $2\pi RH$

Total Surface area= $2\pi R(H+R)$

Volume= $\pi R^2 H$

15. Right Circular Cone



$H=\sqrt{m^2-R^2}$

Lateral surface area= πRm

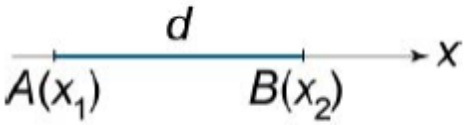
Volume= $\frac{1}{3}\pi R^2 H$

16. Sphere

Surface area=$4\pi R^2$

volume= $\frac{4}{3}\pi R^3$

17. Distance between two points A and B



$=|x_2-x_1|=|x_1-x_2|$

18. General equation of 2nd degree

$ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$
represents

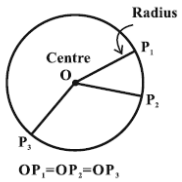
(a) **Circle** if $\Delta = abc+2fgh-af^2-bg^2-ch^2 \neq 0$; $a=b$ *and* $h=0$.

(b) **Parabola** if $\Delta = abc+2fgh-af^2-bg^2-ch^2 \neq 0$; and $h^2=ab$.

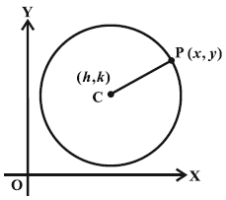
(c) **Ellipse** if $\Delta = abc+2fgh-af^2-bg^2-ch^2 \neq 0$; $h^2 < ab$.

(d) **Hyperbola** if $\Delta = abc+2fgh-af^2-bg^2-ch^2 \neq 0$; and $h^2 > ab$.

19. Circle



Standard equation : $(x-h)^2 + (y-k)^2 = r^2$ where (h,k) is centre and r is the radius of the circle.



20. Special Forms of Equation of a Circle

(a) If the center is at ***Origin*** then the equation of the circle becomes $x^2+y^2=r^2$

(b) If the end points of a diameter are given as (x_1, y_1) and (x_2, y_2), then the equation of the circle is written as $(x-x_1)(x-x_2)+(y-y_1)(y-y_2)=0$.

21. General equation of a circle

(a) $x^2 + y^2 + 2gx + 2fy + c = 0$

(b) Its center is $(-g, -f)$

(c) Its radius= $\sqrt{g^2+f^2-c}$

(c) If $\sqrt{g^2+f^2-c} > 0$, radius of the circle is real and the circle is also real.

(d) If $\sqrt{g^2+f^2-c} = 0$ then the radius of the circle is 0 and this circle is called the point circle.

(e) If $\sqrt{g^2+f^2-c} < 0$ then the radius is imaginary. Since the centre is real but the radius is imaginary hence the circle cannot be drawn.

22. Position of a point with respect to Circle

If (x_1, y_1) is a point, and

$S = x^2 + y^2 + 2gx + 2fy + c = 0$ is a circle, then

(a) The point lies **on the** circle if $S_1 = 0$

(b) The point lies **outside** the circle if $S_1 > 0$

(c) The point lies **inside** the circle if $S_1 < 0$
where $S_1 = x_1^2 + y_1^2 + 2gx + 2fy + c$.

23. Intersection of a line and a circle

A line $y=mx+c$ and the circle $x^2 + y^2 = r^2$

(a) **intersect at two real points** if $r > \left|\frac{c}{\sqrt{1+m^2}}\right|$

(b) **touches** when $r = \left|\frac{c}{\sqrt{1+m^2}}\right|$

(c) **do not intersect** at real points if $r < \left|\frac{c}{\sqrt{1+m^2}}\right|$.

24. Other Forms of the equation of Circle

(a) Equation of a circle passing through origin and having intercepts ***2h*** and ***2k*** with axes is given by $(x-h)^2 + (y-k)^2 = h^2 + k^2$.

(b) Equation of a circle touching x-axis and center at (h,k) is given by $(x-h)^2 + (y-k)^2 = k^2$

(c) Equation of a circle touching y-axis and centre at (h,k) is given by $(x-h)^2+(y-k)^2=h^2$

(d) Equation of a circle touching both the axes and center at (h,h) is given by
$(x-h)^2+(y-h)^2=h^2$

25. Parametric Form of a Circle

$x=r\cos\theta$, $y=r\sin\theta$, where r-radius of the circle.

26. Condition for Tangency of a line

The line $y=mx+c$ touches the circle $x^2 + y^2 = r^2$ if $c = \pm r\sqrt{1+m^2}$.

The reason for the existence of the Two values of c is that **Two tangents** are possible. These tangents are at the ends of a diameter.

27. Equation of a tangent

(a) **General equation of a tangent to the circle** $S=x^2 + y^2 + 2gx + 2fy + c = 0$ at a point **(x_1, y_1)** is given by: **$T \equiv xx_1+yy_1 + g(x+x_1) + f(y+y_1) + c = 0$.**

(b) **Equation of the pair of tangents** from an outside point (x_1, y_1) to the given circle $S = 0$ is given by $SS_1 = T^2$ where $S= x^2 + y^2 + 2gx + 2fy + c$; $S_1 = x_1^2 + y_1^2 + 2gx + 2fy + c$; $T= xx_1 + yy_1 + g(x+x_1) + f(y+y_1) + c$.

28. Length of a tangent

Length of tangent is given by $\sqrt{S_1}$.

(a) If the point lies outside the circle then the Length of the tangent exists.

(b) If the point lies on the circle then length of the tangent is 0.

(c) If the point is inside the circle, then there exists no tangent, hence no length is possible

Note

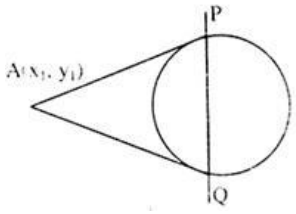
(a) If P is a point outside a circle and PT is the length of the circle i.e., T is the point of contact on the circle and another line from P cuts the circle at A and B then PT^2 = PA. PB.

(b) Square of the length of the tangent S_1 is called the ***Power of the point***.

(c) The power of point can be Negative, Zero or Positive as the point lies inside, at or outside the circle respectively.

Chord of Contact

Let AP and AQ be two tangents to the circle from the point (x_1,y_1). Then the line joining P and Q is called the chord of contact.



(a) Equation of a chord of contact is given by T=0.

(b) Equation of a chord bisected at point (x_1,y_1) is given by $T=S_1$.

29. Common tangents

Common tangents to two circles are of Two types:

30. Number of common tangents

1. If C_1 and C_2 are the two centres and r_1, r_2 are the two radii and $C_1C_2 > r_1 + r_2$ then
   The two circles will neither touch nor cut each other, and
   There will be 4 common tangents: 2 Transverse and 2 Direct.

2. If $C_1C_2 = r_1 + r_2$, then

   The circles will touch externally, and

   There will be 3 Tangents: 2 direct and 1 Transverse.

3. If $|r_1 - r_2| < C_1C_2 < r_1 + r_2$ then

   The circles will intersect at two points and

   Only 2 direct tangents will be possible.

4. If $C_1C_2 = r_1 - r_2$ then

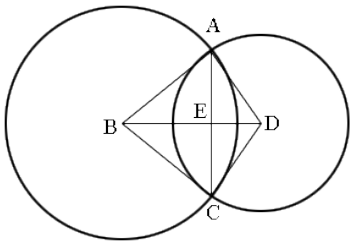
   The circles touch each other internally, and

   Only one common tangent is possible.

5. If $C_1C_2 < r_1 - r_2$, then There will be no common tangent.

31. Common chord

A line joining two common points of intersections of the two circles is called common chord.



In the figure, AC is the common chord.

If the equations of two circles are $S_1 = 0$ and $S_2 = 0$, then the equation of the common chord is given by $S_1 - S_2 = 0$.

32. Angle between Two Circles

Angle between two circles is defined as the angle between their tangents at the common point of intersection.

(a) Angle between two circles is given by $\cos\theta = \frac{r_1^2 + r_2^2 - d^2}{2r_1r_2}$ where d = distance between two centres.

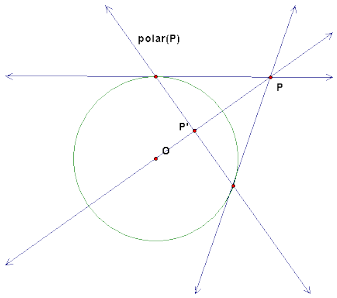
(b) Two circles cut each other orthogonally iff $2 g_1 g_2 + 2 f_1 f_2 = c_1 + c_2$.

33. Director Circle

Director Circle is the locus of the point of the intersection of two perpendicular tangents to a circle. Obviously, the point will lie outside the circle. The equation of the director circle of $x^2 + y^2 = a^2$ is given by $x^2+y^2=2a^2$.

34. Pole and Polar of a Circle

If P' (x_1, y_1) is any point on the circle, ***inside*** or outside the circle and a chord AB passing through it is drawn; the tangents at A and B meet at some point P(h,k), then the locus of P is called the Polar of P' and P' is called the Pole. Its equation is T=0.



Equation of a Polar w.r.t. a point (x_1 ,y_1) is given by T = 0.

35. Some Important Facts related to Circles

(a) If $S_1=0$ and $S_2=0$ are the two circles then the family of circles passing through the points of intersections of these circles is given by $S_1+\lambda S_2=0$ where λ is a parameter obtainable under some necessary conditions. Note $\lambda \neq -1$.

(c) **Radical axis** is the locus of the point from which the equal tangents to the circles are drawn. The equation is given by: $S_1 - S_2 = 0$

(d) The system of the ***co-axial circles*** is of the form $x^2 + y^2 + 2gx + c = 0$ or $x^2 + y^2 + 2fy + c=0$.

(e) If $lx+my=1$ touches a circle $x^2+y^2=a^2$, then $l^2+m^2=a^{-2}$.

36. Limiting Points

Limiting Points of a coaxial system of circles are the members of the system which have zero radius. If $x^2 + y^2 + 2 gx + c=0$ is the coaxial circles having x-axis as common radical axis then its centre is (- g, 0) and radius $\sqrt{g^2 - ac}$ = 0 i.e., $g = \pm\sqrt{c}$. The limiting points will be $\left(\pm\sqrt{c},0\right)$

Note

(a) The limiting points are real and distinct if c is positive , imaginary if c is negative and real and equal (coincident) if c=0.

(b) The limiting points of a system of co-axial circles are conjugate points with respect to any member of the system.

(c) Each circle through the limiting points of a co-axial system is orthogonal to all circles of the system.

(d) The circles with Zero radius are called Point Circles.

37. Images of the Circle

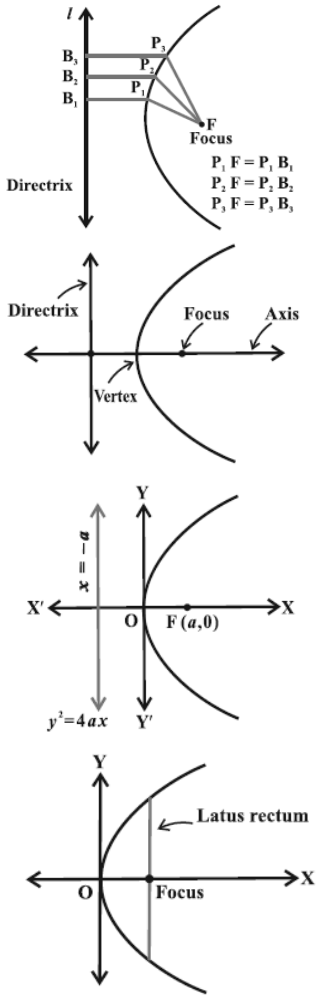
(a) Image of the circle $S\equiv(x-h)^2+(y-k)^2-a^2=0$ with respect to x-axis as line mirror will be $(x-h)^2+(y+k)^2-a^2=0$

(b) Image of the circle $S\equiv(x-h)^2+(y-k)^2-a^2=0$ with respect to y-axis as line mirror will be $(x+h)^2+(y-k)^2-a^2=0$

(c) Image of the circle S=0 with respect to the line lx+my+n=0 as mirror will be $(x-h')^2+(y-k')^2-a^2=0$ where (h', k') is the image of (h,k) with respect to the line mirror lx+my+n=0 .

38. Parabola

A parabola is a locus of a point that moves in such a way that its distance from a fixed point is always equal to the perpendicular distance from a fixed line. The fixed point is called the **focus** and the fixed line is called the **directrix**. **Eccentricity(e)** of the parabola is 1.



39. Standard Equation of a Parabola

(a) Standard equation of a Parabola is given by: $y^2 = 4ax$.

(b) Parametric form of the Parabola: $x=at^2$, $y=2at$.

(c) **General equation**:

If S(h,k) is a fixed point and lx+my+n=0 is a fixed line then the Locus of the point P (x,y) under the condition PS=PM is called the Parabola.

$$\sqrt{(x-h)^2+(y-k)^2} = \frac{lx+my+n}{\sqrt{l^2+m^2}}$$

(d) **General equation of 2nd degree** $ax^2 + 2hxy + by^2 + 2gx + 2fy + c=0$ represents a **Parabola** if $\Delta = abc + 2fgh - af^2 - bg^2 - ch^2 \neq 0$ and $h^2 - ab = 0$.

(e) Parabola $y^2 = 4ax$ opens to Right and symmetric to x-axis.

(f) Parabola $y^2 = -4ax$ opens to Left and symmetric to x-axis.

(g) Parabola $x^2 = 4by$ opens Upward and symmetric to y-axis.

(h) Parabola $x^2 = -4by$ opens Downward and symmetric to y-axis.

40. Position of a point

Let $P(x_1,y_1)$ be a point and S a parabola. Replace x by x_1 and y by y_1 in S to get a new expression S_1. The point P will lie

(a) On the Parabola if $S_1=0$,

(b) Inside the Parabola if $S_1<0$, or

(c) Outside the Parabola if $S_1>0$

41. Length of intercept

The length made by line y=mx+c between the parabola $y^2 = 4ax$ is $\frac{4}{m^2}\sqrt{a(1+m^2)(a-mc)}$

42. Condition for tangency

The line y=mx+c touches a parabola $y^2 = 4ax$ if $c = a/m$

43. Condition for being Normal

The line y=mx+c will be a normal to parbola $y^2 = 4ax$ if $c = -2am - am^3$

44. Some Important Facts

(a) If a normal at t_1 meets again the parabola $y^2 = 4ax$ at the point t_2 then this is called as ***normal chord***. For a normal chord $t_2 = t_1 - \frac{2}{t_1}$.

(b) Length of normal chord = $a(t_1 - t_2)\sqrt{(t_1 + t_2)^2 + 4} = \frac{4a(t_1^2 + 1)^{3/2}}{t_1^2}$

(c) If two normals at point t_1 and t_2 meet on the parabola then $t_1 t_2 = 2$.

(d) Equation of the chord of contact of tangents drawn from a point (x_1,y_1) to the parabola $y^2 = 4ax$ is given by $yy_1 = 2a(x+x_1)$.

(e) Length of chord of contact= $\frac{1}{a}\sqrt{(y_1^2 - 4ax_1)(y_1^2 + 4a^2)}$

(f) Area of the triangle formed by tangents drawn from (x_1,y_1) and their chord of contact is $\frac{1}{2a}(y_1^2 - 4ax_1)^{3/2}$

(g) The area of triangle formed by three points on a parabola is twice the area of the triangle formed by the tangents at these points.

(h) The parabola has two real foci situated on its axis. One at S and the other at Infinity, the corresponding directrix is also at infinity.

(i) Length of latus rectum = 2 (harmonic mean of focal segment)

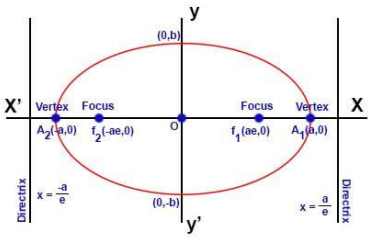
(j) If SZ be perpendicular to the tangent at a point P of a parabola, then Z lies on the tangent at the vertex and $SZ^2 = AS.SP$ where A is the vertex of the parabola.

45. ELLIPSE

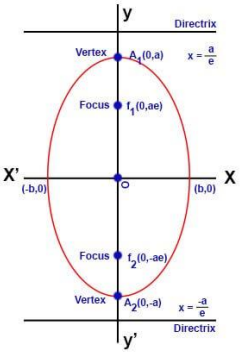
It is the locus of a point that moves in such a way that the ratio of its distance from the fixed point to the fixed line is always constant.

This ratio is called **eccentricity** and this is always less than 1. Fixed point is called the **Focus** and the fixed line is called the **directrix**.

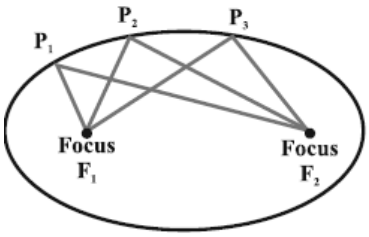
46. Horizontal Ellipse



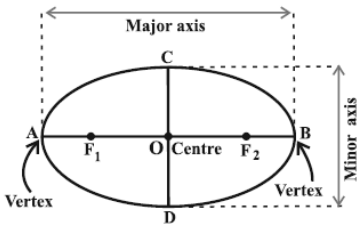
47. Vertical Ellipse

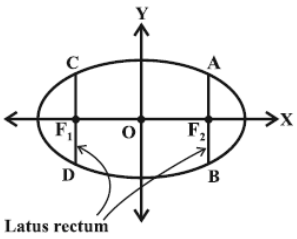


An ellipse is the set of all points in a plane, the sum of whose distances from two fixed points in the plane is a constant. The two fixed points are called the foci of the ellipse.



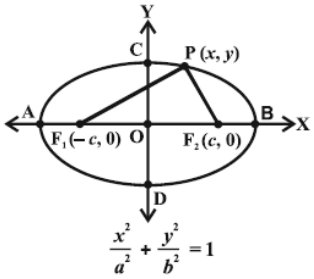
$P_1F_1 + P_1F_2 = P_2F_1 + P_2F_2 = P_3F_1 + P_3F_2$

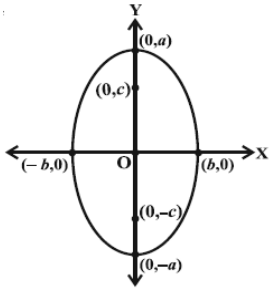




48. Standard equation

$\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ where $b^2=a^2(1-e^2), e<1.$





49. Some basic facts

(a) Length of Major axis is 2a and that of minor axis is 2b. Focus and vertices are always on major axis. Centre is point of intersection where the both axes meet.

(b) Focii are (ae,0) and (-ae,0).

(c) Directrices are $x=\frac{a}{e}$ and $x=-\frac{a}{e}$.

(d) Latus rectum are the double ordinates perpendicular to the Major axis and passing through the Focii.

(e) Length of latus rectum = $\frac{2b^2}{a}$.

(f) The coordinates of the End-points of the Latus Rectum are $\left(ae,\frac{b^2}{a}\right),\left(ae,-\frac{b^2}{a}\right)$

(g) Focal chord is a chord passing through one of the focus.

(h) Vertices are the points where Ellipse meet its Major axis. Focus always lies on the Major axis.

(i) Focal distances of a point (x_1, y_1) on the ellipse of standard equation is (a + ex_1) and (a- ex_1).

(j) The sum of the distances from the two foci of any point on the ellipse is always constant and is equal to the length of major axis i.e. 2a.

(k) The surrounded region is the Interior part of the ellipse and outside this is the exterior region.

(l) **Auxiliary circle** is the circle drawn with centre as Centre of the ellipse and diameter as the length of major axis.

(m) Parametric form of the ellipse is x = a cos θ and y= b sin θ.

(n) If an incident ray passing through the focus strikes the concave side of the ellipse, then the reflected ray will pass through the other focus.

(o) If SM and S'M' are the perpendicular from the foci upon the tangent at any point of the ellipse , then **SM . S'M'= b^2** and M and M' lie on the auxiliary circle.

(p) Two straight lines $y = m_1 x$ and $y = m_2 x$ are conjugate diameters iff $\mathbf{m_1 m_2 = -(b^2/a^2)}$

(q) In an ellipse, the major axis bisects all chords parallel to the minor axis and vice-versa, therefore major and minor axes of an ellipse are conjugate diameters of the ellipse but they do not satisfy the condition $\mathbf{m_1 m_2 = -(b^2/a^2)}$ and are the only perpendicular conjugate diameters.

(r) Eccentric angles of the ends of a pair of conjugate diameter of an ellipse differ by a right angle.

50. Tangent and Normal

(a) A line $y = mx + c$ becomes a tangent to the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ if $c^2 = a^2m^2 + b^2$.

(b) The tangent and normal at any point on the ellipse bisect the external and internal angles between the focal radii to the point.

(c) Four normals can be drawn from a point to an ellipse.

(d) The points on the ellipse, the normals at which to the ellipse pass through a given point are called co-normal points.

(e) If the normal at an end of a latus rectum of an ellipse passes through the other end of the minor axis, then $e^4+e^2=1$.

(f) The Locus of the feet of the perpendiculars from the foci on any tangent to an ellipse is the auxiliary circle.

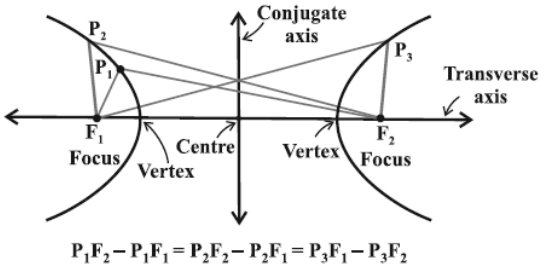
(g) Director circle of the ellipse is the locus of point of intersection of perpendicular tangents.

51. HYPERBOLA

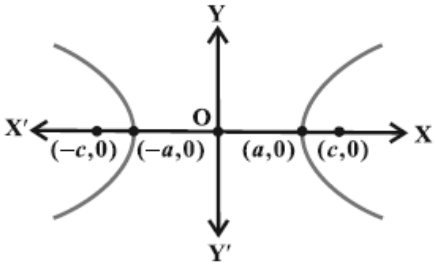
It is the locus of the point that moves in such a way that the ratio of the distance of a point from a fixed point to the distance from a fixed line is always constant and this constant is called the eccentricity and it is always greater than 1.

Or

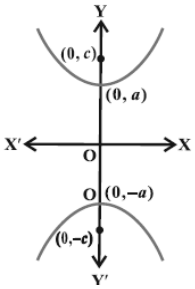
Hyperbola is also defined as the locus of a point which moves in such a way that the difference of the sums of its distances from two fixed points is always constant and is always equal to the length of the transverse axis.



52. Horizontal hyperbola



53. Vertical hyperbola



(a) Vertices and the foci are always on the transverse (Real Axis).

(b) The standard equation of a hyperbola is given by $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1, b^2 = a^2(1-e^2), e>1$.

(c) The line perpendicular to the Transverse axis and passing through the centre is called Conjugate axis

and it nowhere meets the transverse axis. It is an imaginary line.

(d) The middle point of the Transverse axis is called the centre of the hyperbola.

(e) Focal distance of a point P(x,y) on the hyperbola is given as ***SP = ex - a*** and ***S'P = ex + a*** and ***S'P – SP = 2a***.

(f) The hyperbola conjugate to $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1, b^2=a^2(1-e^2), e>1$ is given by $-\frac{x^2}{a^2}+\frac{y^2}{b^2}=1, a^2=b^2(1-e^2), e>1$ and is symmetric about the y-axis as the main hyperbola is symmetric about x-axis.

(g) The region of the hyperbola that lie between the two leaves is the Interior region or the region where centre lies is the **Interior region** and the region where focus lies is the **Exterior region**.

(h) A line y = mx + c is a tangent to hyperbola $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1, b^2=a^2(1-e^2), e>1$ if $c^2=a^2m^2-b^2$.

(i) The Parametric form of the $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1, b^2=a^2(1-e^2), e>1$ is given by ***x = a sec φ*** and ***y = b tan φ***.

(j) **Polar of the Focus** is the directrix.

(k) Any tangent is the polar of its point of contact.

(l) **Director circle** of a hyperbola is the locus of the point from where the two perpendicular tangents are drawn and is given by $x^2+y^2=a^2-b^2$.

(m) **Number of normals** drawn from a point to the hyperbola is Four.

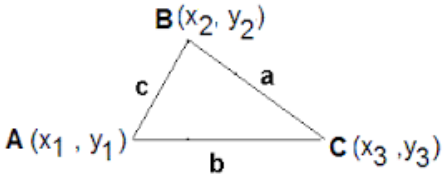
(n) Points on the hyperbola, the normals at which pass through a given point are called the **conormal points**.

(o) Two diameters of a hyperbola are said to be **conjugate diameters** iff each bisects the chords parallel to the other.

(p) In a pair of conjugate diameters of a hyperbola only one meet the hyperbola in a real point.

(q) The hyperbola whose transverse and conjugate axes are equal is called Rectangular hyperbola. The eccentricity of such hyperbola is fixed and is equal to $\sqrt{2}$.

54. Shoelace Formula Or Gauss Formula



55. The area of the triangle ABC

$$=\frac{1}{2}\left[x_1(y_2-y_3)+x_2(y_3-y_1)+x_3(y_1-y_2)\right]$$

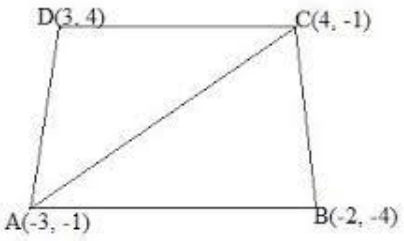
Or,

$$=\frac{1}{2}\begin{bmatrix}x_1 & x_2 & x_3 & x_1\\ y_1 & y_2 & y_3 & y_1\end{bmatrix} =$$

$$\frac{1}{2}\left[x_1y_2+x_2y_3+x_3y_1-x_2y_1-x_3y_2-x_1y_3\right]=$$

$$\frac{1}{2}\begin{vmatrix}x_1 & y_1 & 1\\ x_2 & y_2 & 1\\ x_3 & y_3 & 1\end{vmatrix}$$

56. Area Of A Quadrilateral



57. Area of a quadrilateral with vertices $A(x_1,y_1)$, $B(x_2,y_2)$, $C(x_3,y_3)$, $D(x_4,y_4)$ in continuation is given by

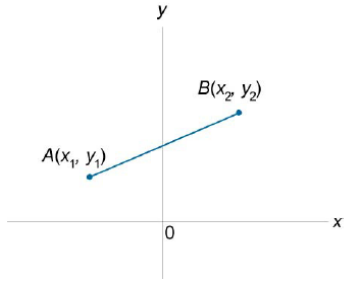
$$\frac{1}{2}\begin{bmatrix} x_1 & x_2 & x_3 & x_4 & x_1 \\ y_1 & y_2 & y_3 & y_4 & y_1 \end{bmatrix}$$

$$= \frac{1}{2}\left[x_1y_2 + x_2y_3 + x_3y_4 + x_4y_1\right] - x_2y_1 - x_3y_2 - x_4y_3 - x_1y_4$$

58. The slope of a line is defined as the ratio of the rise and the run of the point on a plane.

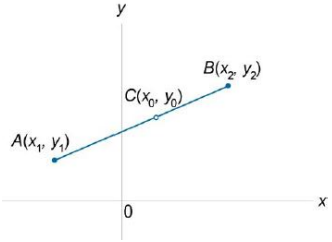
$$slope = \frac{rise}{run} = \frac{y_2 - y_1}{x_2 - x_1}$$

59. Distance between two points (x_1,y_1) and (x_2,y_2)



$$AB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

60. Section Formula. If A and B are two different points and C is a point in between A and B

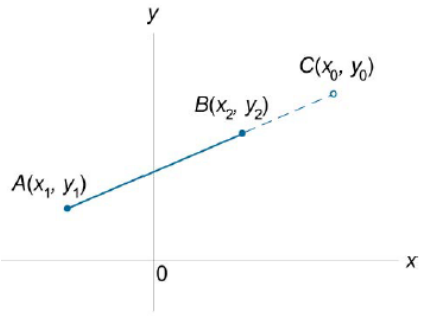


C is said to divide internally the distance between A and B and the coordinates of C are given by

$$x_0 = \frac{\lambda x_2 + x_1}{\lambda + 1}, y_0 = \frac{\lambda y_2 + y_1}{\lambda + 1}$$

Where $\frac{AC}{CB} = \frac{\lambda}{1}$

If C is outside of AB.



C is said to divide AB externally and the corresponding coordinates of C becomes $x_0 = \frac{\lambda x_2 - x_1}{\lambda - 1}, y_0 = \frac{\lambda y_2 - y_1}{\lambda - 1}$

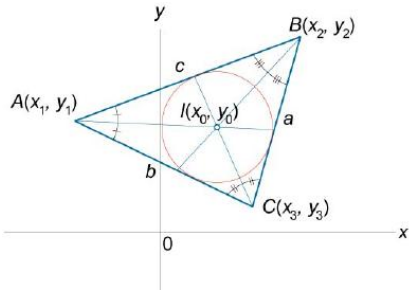
61. If C **is mid-point** of AB then the coordinates are

$$x_0 = \frac{x_2 + x_1}{2}, y_0 = \frac{y_2 + y_1}{2}$$

62. Centroid of a triangle whose vertices are $A(x_1,y_1)$, $B(x_2,y_2)$ and $C(x_3,y_3)$ is given by

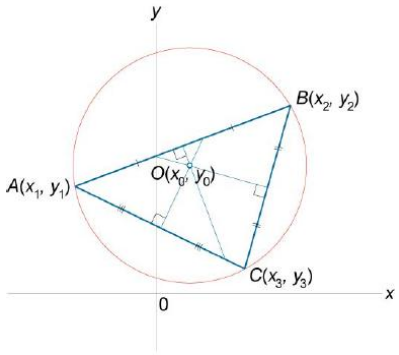
$$x_0 = \frac{x_1 + x_2 + x_3}{3}, y_0 = \frac{y_1 + y_2 + y_3}{3}$$

63. Incentre of the triangle whose sides AB=c, BC=a, and AC=b with vertices(x_1,y_1), $B(x_2,y_2)$ and $C(x_3,y_3)$. Incentre is made by the Angle Bisector of the Internal angles of the Triangle. The radius of this Circle is the distance from the Angle bisectors meet point to the perpendicular distance of the side. It is denoted by I and the radius is denoted by r.



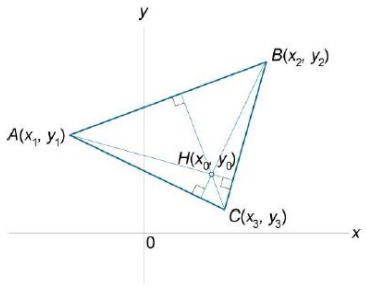
$$x_0 = \frac{ax_1 + bx_2 + cx_3}{a+b+c}, y_0 = \frac{ay_1 + by_2 + cy_3}{a+b+c}$$

64. Circum-centre of the triangle whose vertices are $A(x_1,y_1)$, $B(x_2,y_2)$ and $C(x_3,y_3)$. Circum-centre is made by the Perpendicular Bisectors of the sides of the Triangle. The radius of this Circle is the distance from the point of intersection of the Perpendicular bisectors and one of the vertex. It is denoted by O. The radius is denoted by R.



$$x_0 = \frac{\begin{vmatrix} x_1^2+y_1^2 & y_1 & 1 \\ x_2^2+y_2^2 & y_2 & 1 \\ x_3^2+y_3^2 & y_3 & 1 \end{vmatrix}}{2\begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}}, y_0 = \frac{\begin{vmatrix} x_1 & x_1^2+y_1^2 & 1 \\ x_2 & x_2^2+y_2^2 & 1 \\ x_3 & x_3^2+y_3^2 & 1 \end{vmatrix}}{2\begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}}$$

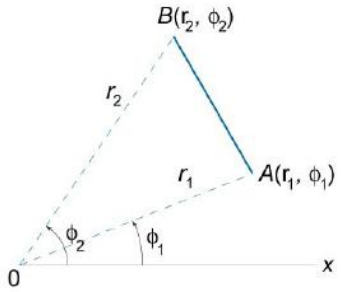
65. Ortho-centre of the triangle whose vertices are $A(x_1,y_1)$, $B(x_2,y_2)$ and $C(x_3,y_3)$. Ortho-centre is made by the Intersection point of the Altitudes from the vertices to the sides of the Triangle. It is denoted by H.



It is given by

$$x_0 = \frac{\begin{vmatrix} y_1 & x_2x_3+y_1^2 & 1 \\ y_2 & x_3x_1+y_2^2 & 1 \\ y_3 & x_1x_2+y_3^2 & 1 \end{vmatrix}}{\begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}}, y_0 = \frac{\begin{vmatrix} x_1^2+y_2y_3 & x_1 & 1 \\ x_2^2+y_1y_3 & x_2 & 1 \\ x_3^2+y_1y_2 & x_3 & 1 \end{vmatrix}}{\begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}}$$

66. Distance between two points $A(r_1,\phi_1)$ and $B(r_2,\phi_2)$ in polar form



$$AB = \sqrt{r_1^2 + r_2^2 - 2r_1r_2\cos(\phi_2 - \phi_1)}$$

67. General equation of a straight line: ax+by+c=0

68. Slope–Intercept form of a straight line: y=mx+c

69. Equation of a line from a point and with a given slope: $y-y_1=m(x-x_1)$

70. Equation of a line from two given points (x_1,y_1) and (x_2,y_2): $y - y_1 = \frac{y_2 - y_1}{x_2 - x_1}(x - x_1)$

71. Equation of line in Intercept form: $\frac{x}{a} + \frac{y}{b} = 1$

72. Normal form of a line: $x\cos\alpha + y\sin\alpha = p$ where p is the perpendicular distance from origin to the line and α is the angle made by the perpendicular with the positive side of x-axis in anticlockwise direction.

73. Point distance form: $\frac{x-x_1}{\cos\alpha}=\frac{y-y_1}{\sin\alpha}$ where (x_1,y_1) lies on the line and α is the angle made by the line with x-axis.

74. Horizontal or a line parallel to x-axis is given by y=k

75. Vertical or a line parallel to y-axis is given by x=k

76. Distance of a point (x_1,y_1) from a line Ax+By+C=0:

$$d=\left|\frac{Ax_1+By_1+C}{\sqrt{A^2+B^2}}\right|$$

77. Two lines $A_1x+B_1y+C_1=0$ and $A_2x+B_2y+C_2=0$ are **parallel** if $\frac{A_1}{A_2}=\frac{B_1}{B_2}$

78. Two lines $y=m_1x+c_1$ and $y=m_2x+c_2$ are **parallel** if $m_1=m_2$.

79. Two lines $A_1x+B_1y+C_1=0$ and $A_2x+B_2y+C_2=0$ are **perpendicular** if $A_1A_2+B_1B_2=0$

80. Two lines $y=m_1x+c_1$ and $y=m_2x+c_2$ are **parallel** if $m_1.m_2=-1$.

81. Angle between Two lines $y=m_1x+c_1$ and $y=m_2x+c_2$ is given by $\tan\theta=\pm\frac{m_2-m_1}{1+m_2m_1}$ where + sign represents acute angle and – sign represents the obtuse angle between the lines.

82. Angle between Two lines $A_1x+B_1y+C_1=0$ and $A_2x+B_2y+C_2=0$ is given by

$$\tan\theta=\pm\frac{A_1A_2+B_1B_2}{\sqrt{A_1^2+B^2{}_1}\sqrt{A_2^2+B^2{}_2}}$$

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.
e-Mail ID: maths.iitk@gmail.com

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Answers to Science Quiz : June'18

Kumud Bala

1. (a)	2. (a)	3. (c)	4. (b)	5. (a)	6. (a)	7. (a)	8. (a)	9. (a)	10. (b)
11. (b)	12. (a)	13. (a)	14. (c)	15. (b)	16. (c)	17. (b)	18. (b)	19. (d)	20. (e)

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ANSWER: CROSSWORD PUZZLE June'18: Prashant Chandra Mahalanobis

Prof. S.B. Dhar

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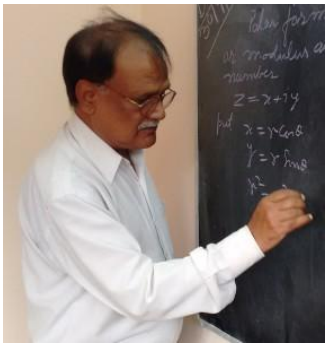
हमारापंचवर्षीयप्रवास

Start: June-2012



April-2015

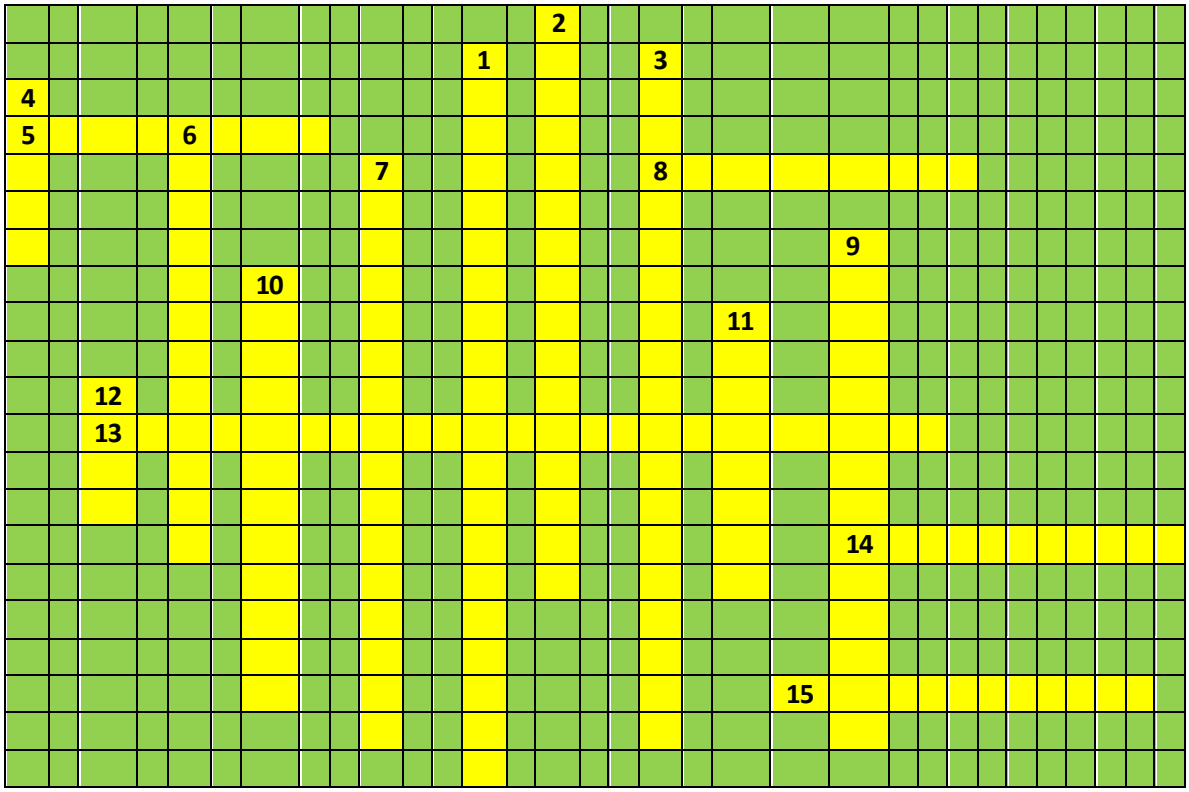
June-2016……..

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.

CROSSWORD PUZZLE July'18: B.C. Toy – A Doctor for The Nation

Prof. SB Dhar



ACROSS

5 Medical College of which Roy was alumnus

8 French writer who wrote about Roy

13 Political party to which Roy was associated

14 Highest Award Roy got in India

15 Constituency he represented

DOWN

1 University of which he was alumnus

2 CM who succeeded BC Roy

3 University where BC Roy addressed Convocation

4 Renowned freedom fighter who was CM of WB

6 State of which Roy was Governor

7 Person who was made trustee of Roy's property

9 To whom BC Roy gifted his house in 1961

10 College from where Roy did his BA

11 One of the cities founded by Roy

12 Number of cities founded by Roy

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Growing with Concepts : Physics

Code: Phy/NLM-1/O/001

Solving Problems Involving Newton's Laws of Motion

Newton's Laws of Motion is a matter of most common experience while performing any action or seeing an action being performed. Therefore, every action whether in equilibrium, uniform motion or acceleration will involve the Laws of Motion in one or the other way. Therefore, possibility of encountering a problem or situation never encountered earlier is infinite. In view of this while attempting solution of problems one must be ready to analyze it with pure ingenuity. Nevertheless, typical questions have been drawn to inculcate practice of handling problems with basic concepts and their application, and accordingly illustrations to the answers have been developed.

It is essential to iterate that typical question may, at times, contain certain information, not needed in solution. Likewise, one might make a start applying concepts in apparently identical situation. But, where to proceed with it for the solution or drop it is an important decision to avoid solution either becoming complex or incorrect. Likewise, values of universal constants like g, π etc. are generally given in examinations, but in case it is not there choose a value as per your wisdom and calculations with principles of significant figures and rounding of numbers will be a good enough to write correct answer. It may be observed that certain figures or details are too minimized. But, handling this document give us liberty to manage the space by adjusting size of figures and reader to zoom them as per requirement of clarity. Despite best efforts by authors, one may find it difficult to match the answer arrived at with the one given. It might be an inadvertent typographical despite meticulous efforts. In such a situation remain open to fix the answer by reviewing solution, consultation with colleagues and your teachers. In case considered necessary readers are welcome to scan question and related solution with answer and write us through *Contact Us*.

Analyzing problems by splitting it into different situations given or inbuilt, drawing diagram and writing equations for each case is essential at practice stage. Going forward many of these steps become intuitive. Despite, meticulous and stepwise analysis helps to avoid chances of errors. This is essential to buit comprehension, accuracy and speed necessary for success in competitive examinations.

Last-but-not-the-least understanding concepts from best of the best teachers, books and videos would not help to attain a proficiency in problem solving, unless it is practiced with variety of problems from different sources and discussing them with colleagues or solving their difficulties. This is nothing but imbibing a proficiency in group dynamics involving caring-and-sharing not a sermon on morality but a necessity of improving performance in times ahead.

Education is just not collection of facts. It is ability to observe, think, analyze and apply it in evolving a sustainable solution, on a pedestal of coexistence.

Going forward effort is being made to cover complete scope of physics upto 12^{th} standard and give more practice questions in Online Test and Self Assessment Mode involving topic-wise, section-wise, level-wise and type of questions.

Inputs on any typographical error in question, answer, illustration and/or diversity of scope of the resource material would be gratefully welcomed, in the spirit of Personal Social Responsibility (PSR). All this is being made available as free web-resource in an effort to complement that already available or accessible.

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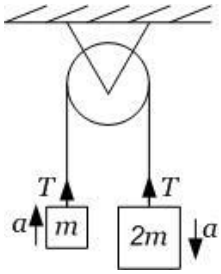
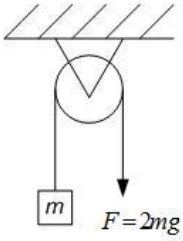
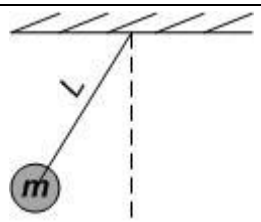
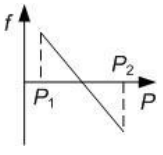
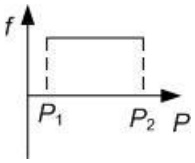
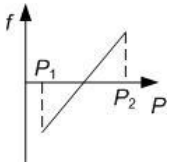
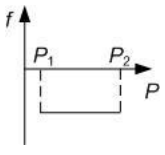
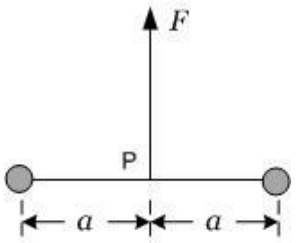
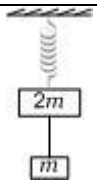
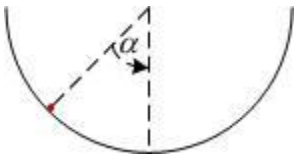
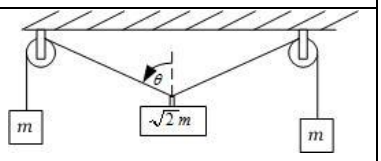
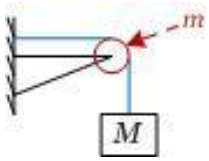
Code: Phy/NLM-1/O/001

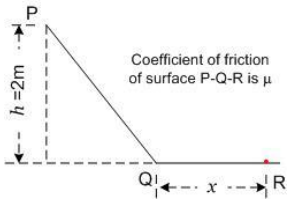
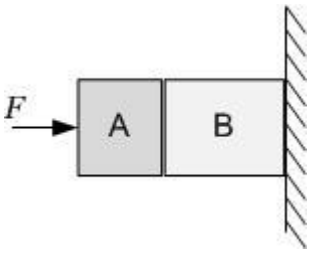
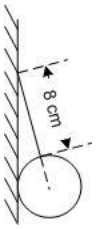
Newton's Laws of Motion : Objective Questions (Typical)

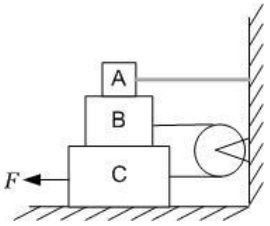
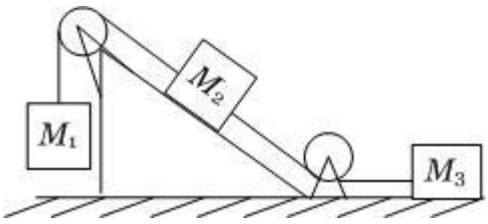
No of Questions:30 **Time Allotted: $1\frac{1}{2}$ Hours**

All questions are compulsory

Q-01	Two trains are moving on rails, on equator in opposite directions, one from East to West and other from West to East. The force Exerted on rails by train from West to East as compared to that in opposite direction is : **(a)** Greater **(b)** Lesser **(c)** Equal **(d)** Information is incomplete for answer
Q-02	Two pulley arrangement shown in the figures **(i)** and **(ii)** having rope of negligible mass. Acceleration of mass m in arrangement **(i)** is - **(i)**  (ii)  **(a)** Greater than in (ii) **(b)** Lesser than in (ii) **(c)** (Equal to that in (ii) **(d)** Information is incomplete for answer
Q-03	A ball of mass 0.5 kg is attached to the end of a string of length 0.5 m. The ball is rotated on a horizontal circular path about its vertical line of free suspension. Maximum tension that string can bear is 324 N. Maximum possible value of angular velocity of ball is - **(a)** $9\ rad\cdot \sec^{-1}$ **(b)** $18\ rad\cdot \sec^{-1}$ **(c)** $27\ rad\cdot \sec^{-1}$ **(d)** $36\ rad\cdot \sec^{-1}$ 
Q-04	A block of mass m is on a plane inclined at an angle θ with horizontal. Coefficient of friction between the block and the plane is μ and $tan\theta = \mu$. The block is held stationary by applying a force P parallel to the plane. As P is varied from $P_1 = mg(sin\theta - \mu\, cos\theta)$ to $P_1 = mg(sin\theta + \mu\, cos\theta)$ the frictional force f varies P as shown in - **(a)**  **(b)**  **(c)**  **(d)** 

Q-05	A piece of wire is bent in the shape of a parabola $y = kx^2$ where X-axis is horizontal and Y-axis is vertical. A bead of mass m on it can slide without friction. The bead is at lowest position when the wire stays at rest. The wire-bead arrangement is now is now given an acceleration a parallel to X-axis. The bead shall be shall be in equilibrium w.r.t wire after a displacement - **(a)** $\frac{a}{gk}$ **(b)** $\frac{a}{2gk}$ **(c)** $\frac{2a}{gk}$ **(d)** $\frac{a}{4gk}$
Q-06	A particle moves in X-Y plane under the influence of a force such that its linear momentum is $\vec{p} = A[\cos(kt)\,\hat{\imath} - \sin(kt)\,\hat{\jmath}]$. where A and k are constants. The angle between the force and the momentum is- **(a)** 0^0 **(b)** 30^0 **(c)** 45^0 **(d)** 90^0
Q-07	Two particles of mass m each are tied at ends of a light string of length $2a$. The whole system is kept on a friction-less horizontal surface with the string held straight so that each mass is at a distance a from its center P. Now the mid point of the string is pulled vertically upward with a small constant force F such that particles move towards each other on the surface. the magnitude of acceleration, when the separation, when distance between the Two balls becomes $2x$ is - **(a)** $\frac{F}{2m}\cdot\frac{a}{\sqrt{a^2-x^2}}$ **(b)** $\frac{F}{2m}\cdot\frac{x}{\sqrt{a^2-x^2}}$ **(c)** $\frac{F}{2m}\cdot\frac{x}{a}$ **(d)** $\frac{F}{2m}\cdot\frac{\sqrt{a^2-x^2}}{x}$ 
Q-08	Two blocks A and B of masses $2m$ and m, respectively, are connected by a mass-less and in-extensible string. The whole system is suspended by a mass-less spring as shown in the figure. Magnitude of acceleration of A and B, immediately after the string is cut, respectively, are – **(a)** $g, \frac{g}{2}$ **(b)** $\frac{g}{2}, g$ **(c)** g, g **(d)** $\frac{g}{2}, \frac{g}{2}$ 
Q-09	An insect crawls up a hemispherical surface slowly, as shown in the figure. The coefficient of friction between the surface and insect is $\frac{1}{3}$. If the line joining the center of the hemisphere to the insect makes an $\angle\theta$ with the vertical, then insect can crawl upto maximum possible value of $\angle\theta$ is – **(a)** $\cot^{-1}3$ **(b)** $\tan^{-1}3$ **(c)** $\sec^{-1}3$ **(d)** $\mathrm{cosec}^{-1}3$ 
Q-10	A system of pulleys and string of negligible mass. System shall remain in equilibrium when $\angle\theta$ is - **(a)** 0^0 **(b)** 30^0 **(c)** 45^0 **(d)** 60^0 
Q-11	A pulley of mass m is pivoted on a clamp as shown in the figure. A string of negligible mass with a mass of M tied at one end passes over the pulley and its other end is tied to wall. The force of reaction offered by the clamp on pulley is – **(a)** $\sqrt{2}Mg$ (b) $\sqrt{2}mg$ (c) $\sqrt{(M+m)^2+m^2}\cdot g$ (d) $\sqrt{(M+m)^2+M^2}\cdot g$ 
Q-12	A long horizontal rod is at rest, has a bead which can slide along its length, and initially placed at a distance L from one end A of the rod. The rod is set in a horizontal angular acceleration α. If coefficient of friction between the rod and bead is μ, and gravity is neglected, then the time after which the bead starts slipping is – **(a)** $\sqrt{\frac{\mu}{\alpha}}$ **(b)** $\frac{\mu}{\sqrt{\alpha}}$ **(c)** $\frac{1}{\sqrt{\mu\alpha}}$ **(d)** Infinitesimal

Q-13	A block of mass 100 gm is held against a wall by applying a horizontal force of 5 N on the block. If the coefficient of friction between the block and the wall is 0.5. The magnitude of frictional force acting on the block is – **(a)** 2.5 N **(b)** 0.98 N **(c)** 4.9 N **(d)** 0.49 N
Q-14	A car is moving on a circular-horizontal track of radius 10 m with constant speed of 10 ms^{-1}. A plumb bob is suspended from the roof of the car by a light thread of length 1.0 m. The angle made by the rod with track is – **(a)** Zero **(b)** 30^0 **(c)** 45^0**(d)** 30^0
Q-15	A ship of mass 3×10^7kg initially at set is pulled by a force 5×10^4N through a distance of 3 m. Assuming that the resistance due to water is negligible, the speed of the ship is - **(a)** 1.5 ms^{-1} **(b)** 60 ms^{-1} **(c)** 0.1 ms^{-1} **(d)** 5 ms^{-1}
Q-16	A particle of mass m moves along a track P-Q-R which is uniformly rough as shown in the figure. The coefficient of friction, between the particle and the track is μ. The particle is released, from rest, from the point P and it comes to rest at a point R. The energies lost by the ball over parts of the track P-Q and Q-R are equal and no other loss of energy along the track P-Q-R. The values of μ and distance x are, respectively close to - **(a)** 0.2 and 3.5 m **(b)** 0.29 and 3.5 m **(c)** 0.29 and 6.5 m **(d)** 0.2 and 6.5 m 
Q-17	Given in the figure are Two blocks A and B of weight 20 N and 100 N, respectively. These are being pressed against a wall by a force F as shown. If the coefficient of friction between blocks is 0.1 and between Block B and the wall is 0.15, the frictional force applied by the wall on the block is - a) 80 N **(b)**120 N **(c)** 150 N **(d)** 120 N 
Q-18	A heavy box is to pushed along a rough horizontal floor, for which a person A pushes it with a force F_A at an angle 30^0 and other person B pushes it with a force F_A at an angle 60^0. If coefficient of friction between the box and the floor is $\frac{\sqrt{3}}{5}$ then ratio $\frac{F_A}{F_B}$ is - ***(a)*** $\sqrt{3}$ **(b)** $\frac{5}{\sqrt{3}}$ **(c)** $\sqrt{\frac{3}{2}}$ **(d)** $\frac{1}{2\sqrt{3}}$
Q-20	A block of mass 5 kg is acted upon by a force $\vec{F} = F_x\hat{\imath} + F_y\hat{\jmath}$ has at $t = 0$ a velocity $\vec{v} = 6\hat{\imath} - 2\hat{\jmath}$ ms^{-1} and velocity at at $t = 10$s is $\vec{v} = 6\hat{\jmath}$. Then the Force $\vec{F}$ is – **(a)** $\frac{3}{5}\hat{\imath} - \frac{4}{5}\hat{\jmath}$ N **(b)** $-3\hat{\imath} + 4\hat{\jmath}$ N **(c)** $3\hat{\imath} - 4\hat{\jmath}$ N **(d)** $-\frac{3}{5}\hat{\imath} + \frac{4}{5}\hat{\jmath}$ N
Q-21	A uniform sphere of weight W and radius 5 cm is being held by a string as shown in the figure. The tension in the string will be – **(a)** $\frac{12}{3}W$ **(b)** $\frac{5}{12}W$ **(c)** $\frac{13}{5}W$ **(d)** $\frac{13}{12}W$ 

Q-22	A particle in unform circular motion at a speed V on a circle of radius R, with its center at (0,0), at a point P(R,θ), polar coordinates, is experiencing an acceleration $\vec{a}$ equal to – **(a)** $-\frac{V^2}{R}\cos\theta\,\hat{\imath}+\frac{V^2}{R}\sin\theta\,\hat{\jmath}$ **(b)** $-\frac{V^2}{R}\sin\theta\,\hat{\imath}+\frac{V^2}{R}\cos\theta\,\hat{\jmath}$ **(c)** $-\frac{V^2}{R}\cos\theta\,\hat{\imath}-\frac{V^2}{R}\sin\theta\,\hat{\jmath}$ **(d)** $\frac{V^2}{R}\hat{\imath}+\frac{V^2}{R}\hat{\jmath}$
Q-23	A smooth block is released at rest on a 45^0 incline and then slides a distance d. The time taken to slide is n times as much to the slide on a rough incline. The coefficient of friction of rough incline is – **(a)** $\mu_k=1-\frac{1}{n^2}$ **(b)** $\mu_k=\sqrt{1-\frac{1}{n^2}}$ **(c)** $\mu_s=1-\frac{1}{n^2}$ **(d)** $\mu_s=\sqrt{1-\frac{1}{n^2}}$
Q-24	As shown in the figure the Blocks A, B, and C are of masses 3 kg, 4 kg and 8 kg respectively. The coeffecient of sliding friction between any two surfaces is 0.25. A is held at rest by a massless rigid rod fixed to the wall., while B and C are connected by a light flexible cord passing around a fixed frictionless pulley. Assume that the arrangement shown in figure remains unchanged during the exeriment. The n the orce F necessary to drag C along horizontal surface to the left at a constant speed is – **(a)** 40 N **(b)** 60N **(c)** 80 N **(d)** 100 N 
Q-25	Masses M_1, M_2 and M_3 are connected by massless strings passing over passless and frictionless pulleys P_1 and P_2 as shwn in the figure. The masses move such that the portion of the string between P_1 and P_2 is parallel to the inclined plane and the portion of the string between P_2 and M_2 are horizontal. The masses M_2 and M_3 are 4.0 kg each and the coefficient of kinetic friction masses and the surface is 0.25. Then inclination of plane is 27^0 and mass M_1 moves downwards with a uniform velocity then, mass M_1 and tension in horizontal portion of the string (given that $g=10\,\text{Nms}^{-2}\sin 37^0=0.6$) are - **(a)** 10 kg, 4.2 N **(b)** 5 kg, **(c)** **(d)** 4.2 kg, 10 N 

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बुद्ध ने कहा है.....!

जीवन नदी जैसा है, यहां प्रतिपल सब बह रहा है।

ऐसा ही जीवन का प्रवाह है

जो आये उसे अंगीकार करो

जो जाये उसे अलविदा करो

कुछ पकड़ के मत रखो

ऐसा आदमी कभी दुखी नहीं होता।

- ओशो

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Answers: Newton's Laws of Motions (Part-I)– OBJECTIVE Questions

1	2	3	4	5	6	7	8	9	10
b	b	b	a	b	d	b	b	a	c
Lvl. I	Lvl. I	Lvl. I	Lvl. I	Lvl. I	Lvl. I	Lvl. II	Lvl. II	Lvl. II	Lvl. I
11	12	13	14	15	16	17	18	19	20
d	a	b	c	c	b	b	d	c	b
Lvl. II	Lvl. II	Lvl. II	Lvl. II	Lvl. II	Lvl. II	Lvl. II	Lvl. I	Lvl. I	Lvl. I
21	22	23	24	25	26	27	28	29	30
d	c	a	c	d					
Lvl. I	Lvl.	Lvl. II	Lvl. I	Lvl. III					
31	32	33	34	35					

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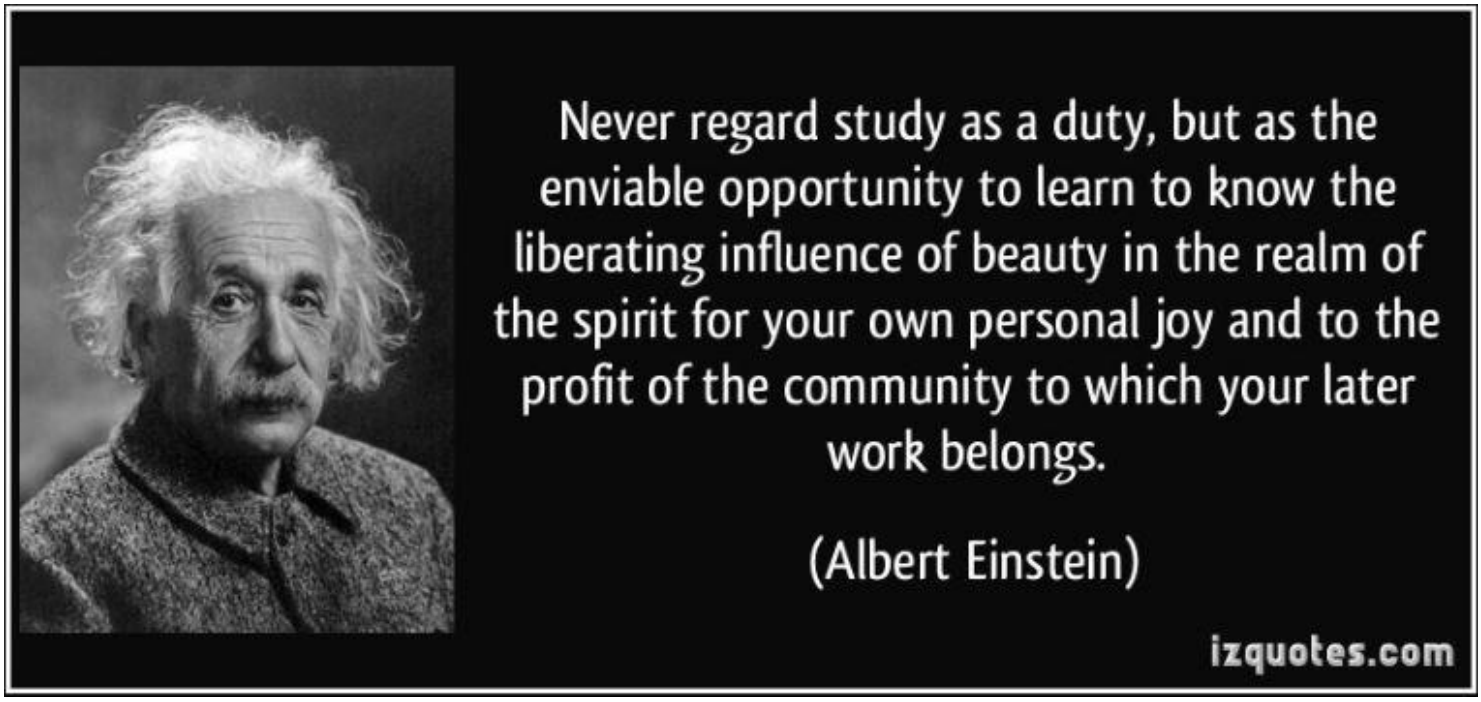


Growing with Concepts: Chemistry

MOLECULAR ORBITAL THEORY- 1

Kumud Bala

Molecular orbital theory was developed by F. Hund and R. S. Mulliken in 1932. The basic idea of molecular orbital theory is that atomic orbitals of individual atoms combine to form molecular orbitals. The electrons in molecules are present in the molecular orbitals which are associated with several nuclei. These molecular orbitals are filled in the same way as the atomic orbitals in atoms are filled.

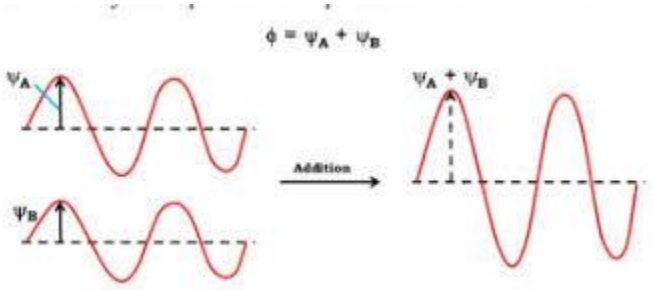
Salient features of molecular orbital theory:

1. Just like an atom, molecule has orbitals of definite energy. As electrons of atoms are present in atomic orbitals, electrons of molecules are present in different molecular orbitals.
2. Molecular orbitals are formed by the merger of atomic orbitals of proper symmetry and comparable energies. So, when two atomic orbitals combine or overlap; they lose their identity and form new orbitals. The new orbitals thus formed are called molecular orbitals.
3. Molecular orbitals are the energy states of a molecule in which electrons of the molecule are filled just as atomic orbitals are the energy states of an atom in which the electrons of the atom are filled.
4. An electron in an atomic orbital is under the influence of only one nucleus. However, an electron in a molecular orbital is under the influence of two or more nuclei depending upon the number of atoms present in the molecule. Thus, an atomic orbital is monocentric while a molecular orbital is polycentric.
5. In terms of probability distribution, a molecular orbital gives the electron probability distribution around a group of nuclei just as an atomic orbital gives the electron probability distribution around the single nucleus.
6. Only those atomic orbitals can combine to form molecular orbitals which have comparable energies and proper orientation. For example, 1s can combine with 1s and not with 2s. Similarly, s-orbital can overlap with p_z-orbital but not with p_x or p_y-orbital or p_z- orbital can combine with p_z-orbital but not with p_x or p_y- orbital (taking Z-axis as the internuclear axis).
7. The number of molecular orbitals formed is equal to the number of combined atomic orbitals.
8. When two atomic orbitals combine, they form two new orbitals called 'bonding molecular orbital' and 'antibonding molecular orbital'.
9. The bonding molecular orbital has lower energy and hence greater stability than the corresponding antibonding molecular orbital and hence lesser stability.
10. The bonding molecular orbitals are represented by σ,π,δ, etc. whereas the corresponding antibonding molecular orbitals are represented by σ^*,π^*,δ^*, etc.
11. The shapes of the molecular orbitals formed depend upon the type of the combining atomic orbitals.
12. The filling of molecular orbitals takes place according to the same rules as those of the atomic orbitals. These are as Aufbau Principle, Pauli Exclusion Principle and Hund's rule. Molecular orbitals are formed by the combination of atomic orbitals of bonded atoms. We have learnt that according to wave mechanics, the atomic orbitals can be expressed by wave functions (ψ's). The wave functions represent the amplitude of the electron waves. These are obtained from the solutions of Schrodinger wave equation. Similarly, we can write Schrodinger wave equation for the whole molecule. However, it is very difficult to solve the wave equation for molecules. To overcome this problem, scientists have used an approximate method known as

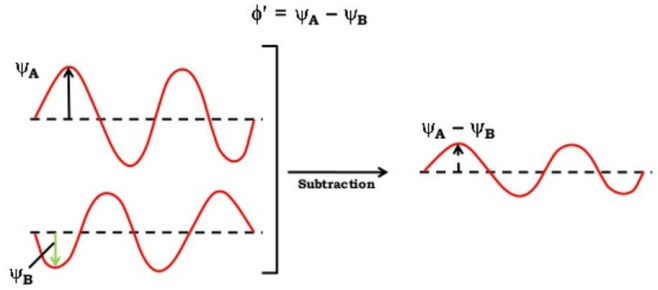
linear combination of atomic orbitals (LCAO method).

Formation of molecular orbitals:- According to LCAO method, the orbitals are formed by the linear combination(addition or subtraction) of atomic orbitals of the atoms which form the molecule. An atomic orbital is an electron wave. The waves of the two atomic orbitals may be in phase or out of phase. Suppose ψ_A and ψ_B represent the amplitudes or wave functions of the electron waves of the atomic orbitals of the two atoms A and B respectively.

Case 1: When two waves are in phase (constructive interference), they add up and the amplitude of the resultant wave is $\phi = \psi_A + \psi_B$

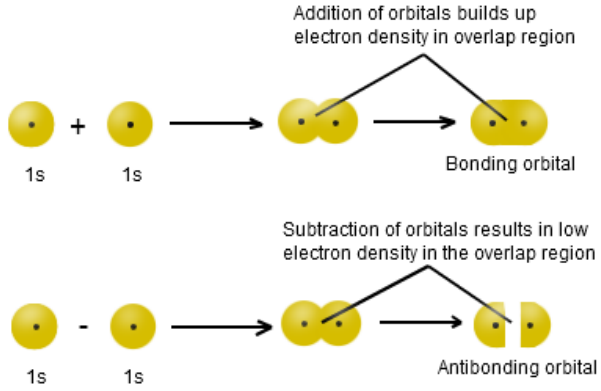


Case 2: When two waves are out of phase (destructive interference), the waves are subtracted from each other so that the amplitude of the new wave is $\phi' = \psi_A - \psi_B$

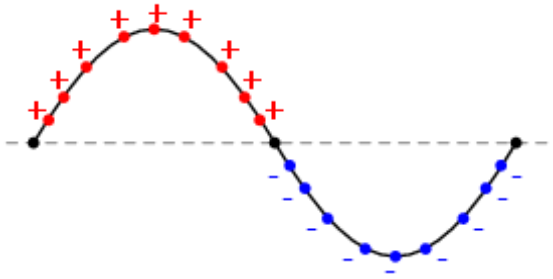


Knowing that the probability is given by the square of the amplitude, we have $\phi^2 = (\psi_A + \psi_B)^2 = \psi_A^2 + \psi_B^2 + 2\psi_A\psi_B$ and $\phi'^2 = (\psi_A - \psi_B)^2 = \psi_A^2 + \psi_B^2 - 2\psi_A\psi_B$ i.e., $\phi^2 > \psi_A^2 + \psi_B^2$, $\phi'^2 < \psi_A^2 + \psi_B^2$

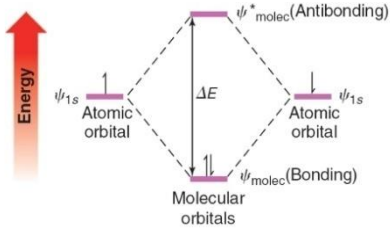
Thus, by the combination of two atomic orbitals, two new molecular orbitals are formed, one by the additive effect and the other by the subtractive effect of the atomic orbitals. The molecular orbital formed by the additive effect of the atomic orbitals is called bonding molecular orbital and the molecular orbital formed by the subtractive effect of the atomic orbitals is called antibonding molecular orbital. The probability of finding the electrons in the bonding molecular orbital increases (i.e., most of the electron density is located between the nuclei of the bonded atoms and hence interacted strongly by both the nuclei) whereas it decreases in the antibonding molecular orbital (i.e., most of the electron density is located away from the space between the nuclei and hence the repulsion between the nuclei is high). In fact, there is a nodal plane between the two nuclei of an antibonding molecular orbital, i.e., a plane on which electron density is zero.



Just as atomic orbitals are represented by s, p, d etc, the bonding molecular orbitals are represented by σ, π, δ etc, and the corresponding antibonding molecular orbitals are represented by putting an asterisk, i.e., by σ^*, π^*, δ^* etc. It may be pointed out here that crests of the electron wave are usually given a '+' sign and the troughs a '–' sign. Thus, bonding molecular orbital is formed by the combination of '+' with '+' and '–' with '–' part of the electron waves whereas antibonding molecular orbitals are formed by the overlap of '+' with '–' part. However, these '+' and '–' signs have nothing to do with the electrical charges on the orbitals. They simply represent the sign of the wave function.

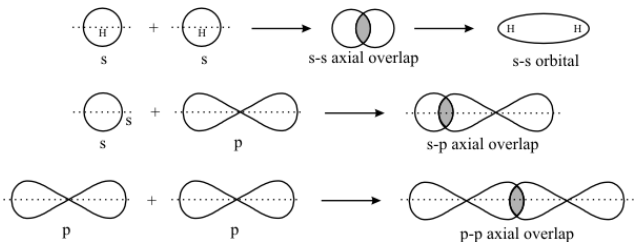


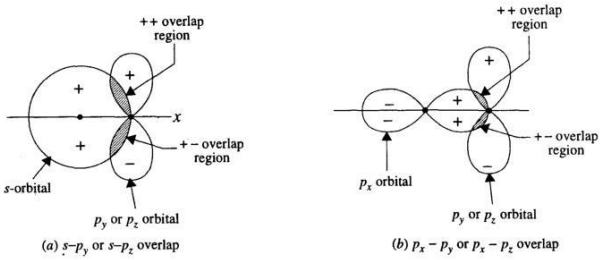
Relative energies of bonding and antibonding molecular orbitals:- We have learnt that in the ease of bonding molecular orbital, the attraction of both the nuclei for both the electrons is increased. This results in lowering of energy. In the case of antibonding molecular orbital, the electrons try to go away from the nuclei and this corresponds to repulsive state. The energy of this orbital will be higher. Thus, the bonding molecular orbital is stabilized relative to the energy of the isolated atoms and antibonding molecular orbital is destabilized relative to the individual atoms. Further, it may be noted that the bonding MO is stabilized to the same extent as the antibonding MO is destabilized. The lowering of energy (Δ) of the bonding MO is called stabilization energy while increase in energy (Δ') of the antibonding MO is called destabilization energy.



Condition for the combination of atomic orbitals:- Only those atomic orbitals can combine to form molecular orbitals which fulfill the following conditions:

1. The combining atomic orbitals must have same or nearly the same energies. For example, in diatomic molecules of the type A_2, 1s atomic orbital of one atom can combine with 1s atomic orbital of another atom, similarly, 2s – orbital can combine with 2s, 2p with 2p and so on. But 1s-orbital of one atom cannot combine with 2s-orbital of another atom, 2s-orbital cannot combine with 2p-orbital.
2. The extent of overlapping between the atomic orbitals of two atoms should be large.
3. The combining atomic orbitals must have proper orientations or the same symmetry about the molecular axis so that they are able to overlap to a considerable extent. For example, taking Z-axis as the internuclear axis, $2p_z$ orbital of one atom can combine with $2p_z$ orbital of another atom but $2p_z$ orbital of one atom cannot combine with $2p_x$ or $2p_y$ orbital of another atom or $2p_x$ cannot combine with $2p_y$. Similarly, 2s-orbital of one atom can combine with $2p_z$ orbital but cannot combine with $2p_x$ or $2p_y$- orbital of another atom because they do not have orientation for the overlap, as shown in figures.





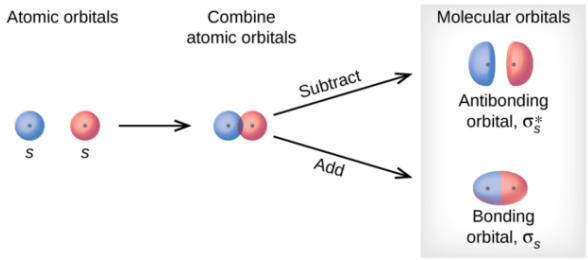
Disallowed overlaps of atomic orbitals on the basis of their symmetry. The shaded portions indicate the overlap regions.

In the 2s-$2p_x$ combination, a small overlapping has been shown. ++ Overlap is cancelled by + – overlaps. As a result no molecular orbital is formed.

Types of molecular orbitals formed:- Let us now see what types of molecular orbitals are formed by combination of different types of atomic orbitals and how they are named.

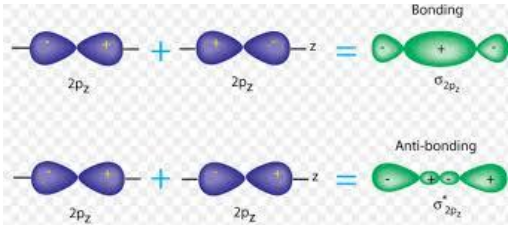
If two atomic orbitals overlap along the internuclear axis, the molecular orbital formed is called σ-molecular orbital. If two atomic orbitals overlap sideways, the molecular orbital formed is called π molecular orbital. Representing the orbitals in terms of signs of the wave functions, as s-orbitals are spherically symmetrical, their wave function has the same sign in all directions. In case of p-orbitals, one lobe is given a '+' sign and the other a '–' sign. Overlapping of '+' part of the electron cloud of one atom with '+' part of the electron cloud of the second atom implies addition of atomic orbitals leading to the formation of the bonding molecular orbital. The overlap of '+' part of the electron cloud of one atom with '–' part of the electron cloud of the second atom means the subtraction of the atomic orbitals leading to the formation of antibonding molecular orbital. A few simple cases of the combination of atomic orbitals are given below.

(i) 1s with 1s:- The wave functions of two 1s atomic orbitals can combine in two different ways: (a) when both have the same sign (b) when both have the different sign. Two 1s-orbitals combine by addition and subtraction of overlapping to form bonding and antibonding molecular orbitals. These are labeled as σ1s and σ*1s. σ Indicates, overlapping is along the internuclear axis.

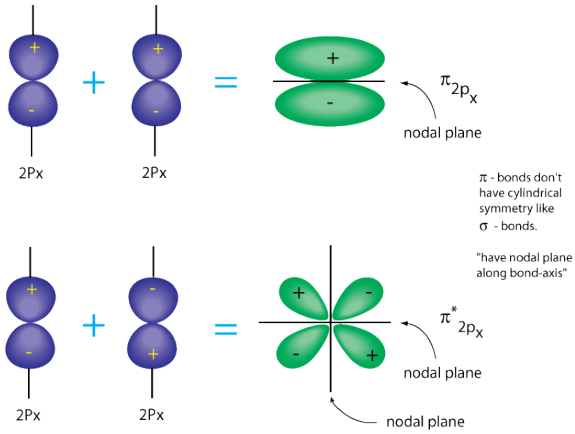


(ii) 2s with 2s:- 2s orbitals combine by addition and subtraction of overlapping to form bonding and antibonding molecular orbitals, labeled as σ2s and σ*2s. But they are slightly larger in size.

(iii) $2p_z$ with $2p_z$:- Taking Z-axis as the internuclear axis, two $2p_z$ orbitals overlap head on forming σ bond. Two orbitals overlap to form bonding and antibonding molecular orbitals by addition and subtraction. They are designated as $\sigma 2p_z$ and $\sigma^* 2p_z$.



(iv) $2p_x$ with $2p_x$ or $2p_y$ with $2p_y$:- When a $2p_x$ ($2p_y$) atomic orbital of one atom approaches the $2p_x$ or ($2p_y$) atomic orbital of another atom, the overlapping occurs sidewise and not end to end. The molecular orbital formed by overlap is known as pi (π) molecular orbital. The molecular orbital formed is not symmetrical about the internuclear axis. The molecular orbital formed by overlapping of two $2p_x$ atomic orbitals by the addition and subtraction of electron waves are called bonding and antibonding molecular orbital labeled as $\pi(2p_x)$ or $\pi(2p_y)$ and $\pi^*(2p_x)$ or π^* $(2p_y)$. It may be noted that whereas $\pi(2p_x)$ or $\pi(2p_y)$ has one nodal plane, $\pi^*(2p_x)$ or π^* $(2p_y)$ has two nodal planes.



ASSIGNMENT

1. The number of nodal planes present in σ*s antibonding orbitals is –
(a) 0 (b) 3 (c) 1 (d) 2

2. When two atomic orbitals combine, energy of bonding molecular orbital is lowered by x while that of antibonding molecular orbital is raised by y. Then –
(a) x=y (b) x<y (c) x>y (d) can be any of these.

3. Which of the following molecular orbitals has two nodal planes?
(a) σ2s (b) $\pi 2p_y$ (c) $\pi^* 2p_y$ (d) $\sigma^* 2p_x$

4. Which one of the following has maximum number of nodal planes?
(a) σ*1s (b) $\sigma^* 2p_z$ (c) $\pi 2p_x$ (d) $\pi^* 2p_y$

5. If z-axis is the internuclear axis, which of the following combination is not allowed?
(a) 2s and 2s (b) 1s and $2p_x$
(c) $2p_y$ and $2p_y$ (d) $2p_x$ and $2p_z$

6. Which of the following combination of atomic orbitals will give antibonding π- molecular orbital? (assume z-axis as internuclear axis) –
(a) 2s + $2p_z$ (b) $2p_y$ +$2p_y$
(c) $2p_x - 2p_x$ (d) $2p_z - 2p_z$

7. Which of the following combination of atomic orbitals will give bonding σ- molecular orbital? (assume z-axis as internuclear axis)
(a) 2s + 2s (b) $2p_x - 2p_x$
(c) $2p_y + 2p_y$ (d) 1s – 1s

8. If z-axis is the molecular axis, then the p-molecular orbitals are formed by the overlap of:
(a) 2s and $2p_x$ (b) $2p_x$ and $2p_y$ (c) $2p_x$ and $2p_x$ (d) $2p_x$ and $2p_z$

Answers: 1. (c) 2. (b) 3. (c) 4. (d) 5. (c) 6. (d) 7. (a) 8. (c)

Author is M.Sc. (Chem.), M.Ed. and Advanced Diploma in German Language (Gold Medallist). She retired as a Principal, Govt. School Haryana, has 3-1/2 years' experience in teaching Chemistry and distance teaching through lectures on Radio and Videos. She has volunteered to complement mentoring of students for Chemistry through Online Web-enabled Classes of this initiative.
e-Mail ID: kumud.bala@yahoo.com

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Develop a passion for learning.
If you do, you will never cease to grow.

-Anthony J D'Angelo

SCIENCE QUIZ-July'18

Kumud Bala

1. In which year was the first world environmental day celebrated?
   (a) 1960 (b) 1974 (c) 1984 (d) 1975
2. On which date of the year is world environmental day observed?
   (a) 5th June (b) 5th July (c) 5th May (d) 5th August
3. Which country is the global host of this year's (2018) WED?
   (a) United states (b) Brazil (c) Mexico (d) India
4. What is the theme of world environmental day 2018?
   (a) Water: vital resource for life
   (b) Development without destruction
   (c) Beat plastic pollution
   (d) Forests: nature at your service.
5. A novel strategy to popularize environmental causes was introduced in 2008. Identify the strategy
   (a) Online games
   (b) Ad- making competition
   (c) Commercial ads with suitable messages
   (d) Asking people for solutions.
6. Which is the world famous monument of India that is affected by air pollution from a nearby factory?
   (a) Taj Mahal
   (b) Red fort
   (c) Gwalior fort , Madhya Pradesh
   (d) Hawa Mahal, Jaipur
7. Which color is used as the sign of conservation of environment?
   (a) Yellow (b) Green (c) Blue (d) Red
8. What is the focus of world environment day?
   (a) Biodiversity awareness
   (b) Economic and environmental awareness
   (c) Universal awareness
   (d) Raising global awareness
9. Who wrote earth anthem?
   (a) John Keats (b) Harivansh Rai Bachchan
   (c) UN Volunteers (d) Abhay K.
10. When and where was the world environmental day anthem launched?
    (a) Nepal 1995 (b) US, 2000
    (c) India 2013 (d) UK, 2006
11. Which was the first country to prohibit manufacture, use, import and sale of polythene bags including plastic wrapping of suitcase?
    (a) Switzerland (b) Maldives
    (c) North Korea (d) Rwanda
12. The major air pollution is:
    (a) CO (b) Oxides of nitrogen
    (c) Soot (d) Oxides of sulphur
13. The major source of CO pollution is:
    (a) Industrial processes (b) Vehicular exhaust
    (c) Forest fires (d) Volcanic activity.
14. Increased concentration of CO_2 in atmosphere is responsible for:
    (a) Greenhouse effect (b) Acid rain
    (c) Lack of photosynthesis (d) Death of aquatic life.
15. Besides CO_2 , other greenhouse gas is:
    (a) CH_4 (b) N_2 (c) Ar (d) O_2
16. Acid rain is produced by:
    (a) Excess release of carbon monoxide by incomplete combustion
    (b) Excess formation of carbon dioxide by ombustion and respiration
    (c) Excess production of NH_3 by industries.
    (d) Excess of NO_2 and SO_2 from burning fossil fuels.
17. Most dangerous metal pollutant of automobile exhausts is:
    (a) Lead (b) Copper (c) Mercury (d) Cadmium.
18. **The** smog is essentially caused by the presence of:
    (a) Oxides of sulphur and nitrogen
    (b) O_2 and N_2
    (c) O_2 and O_3
    (d) O_3 and N_2
19. ---------- of the plastic we use is single- use or disposable
    (a) 10% (b) 40% (c) 50% (d) 70%
20. Who had written the following quote on world environment day? "Earth provides enough to satisfy every man's needs, but not every man' greed".
    (a) Mahatma Gandhi (b) Gaylord Nelson
    (c) Albert Einstein (d) Margaret Mead

21. Each year, at least 8 million tones of plastic end up in the oceans, the equivalent of a full garbage truck -----
(a) Every minute (b) Every second
(c) Every hour (d) Every day.

22. Which country's constitution mandates that at least 60% of the country's landmass be maintained and protected as forestland?
(a) Peru (b) Austria
(c) Bhutan (d) New Zealand

23. According to Ellen MacArthur's research by 2050 the ocean will contain more plastic by weight than -------
(a) Fish (b) Water (c) Seaweed (d) Zooplankton

24. What was the theme of the year 2017?
(a) One world, one environment
(b) Green economy: does it include you?
(c) Connecting people to nature
(d) Nature at your service.

25. The two components of an ecosystem are:
(a) Plants and animals
(b) Biotic and abiotic
(c) Plants and light
(d) Weeds and micro-organisms.

(Answers to this Science Quiz June'18 shall be provided in 1st Supplement to 8th Quarterly e-Bulletin dt. 1st Aug'18)

—00—

Education is one of the great things of life. Education is an attempt to touch the evil at its source, and reform the wrong ways of living as well as one's outlook towards life.

- Plato

Tell me and I'll forget. Show me, and I may not remember. Involve me, and I will understand

- Native American Saying

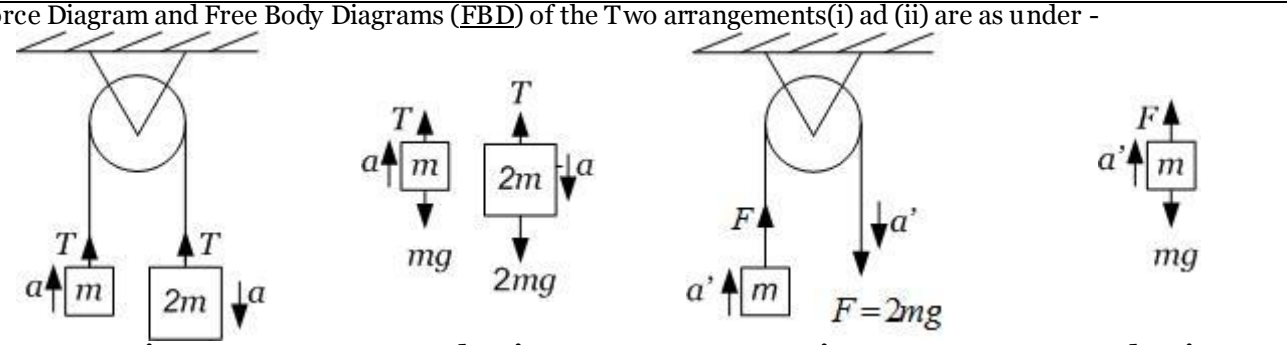
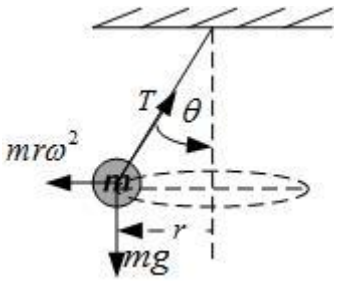
जिस शिक्षा से हम अपना जीवन निर्माण कर सकें, मनुष्य बन सकें,चरित्र गठन कर सकें और विचारों का सामंजस्य कर सकें, वही वास्तव में शिक्षा कहलाने योग्य है |

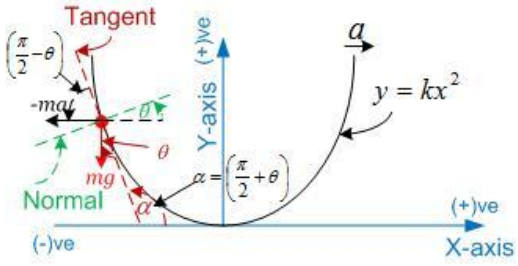
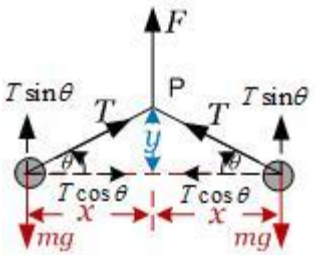
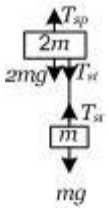
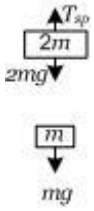
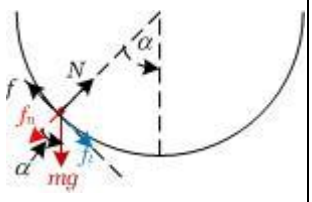
- स्वामी विवेकानंद

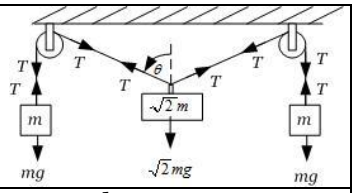
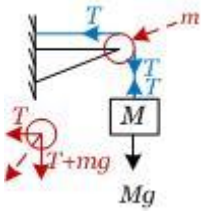
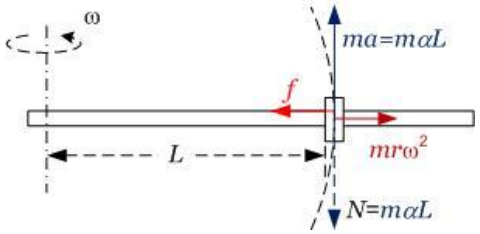
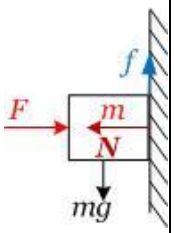
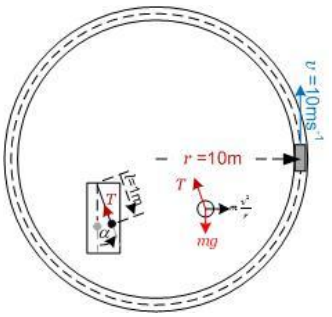
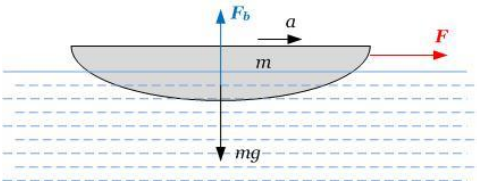
–00–

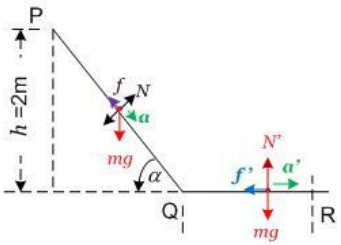
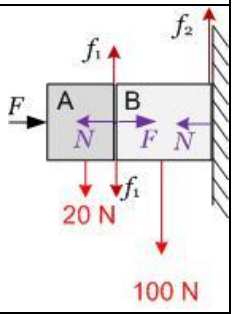
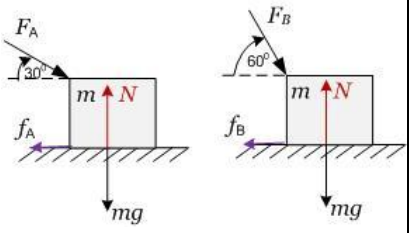
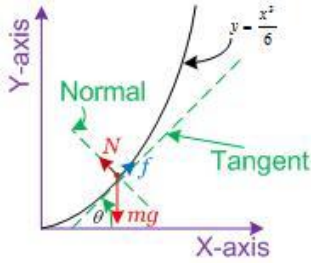
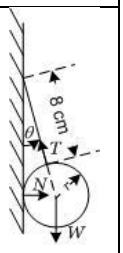
Code: Phy/NLM-1/O/001

Illustrations to Answers of Objective Questions (Typical) on Newton's Laws of Motion (Part-I)

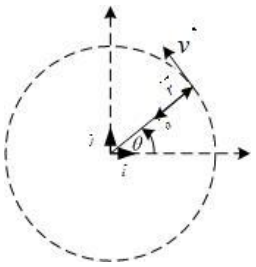
I-01	Let R is the radius of the earth and angular velocity of an object on the equator of the earth w.r.t. its Center, origin of the Frame of Reference (FOR) would be $\omega = \frac{2\pi\times1}{24\times60\times60} = 7.27\times10^{-5}$. Then Centrifugal force on a stationary train at the equator would be $F_{cs} = m\times R\times\omega^2 = m\frac{v_e^{\,2}}{R}$, here m is the mass of the train. Thus net force exerted on the rails would be $F_s = m\times g - F_{cs}$. The earth is rotating about its axis passing through the origin FOR in direction from East towards West. Let V be the speed of the train. Therefore, speed of train moving from West-East w.r.t FOR would be $V_{te} = V + V_e$ and the centrifugal force on the train would be $F_{te} = m\times\left(g - \frac{v_{te}^{\,2}}{R}\right)$.And for the train moving from East-West speed would be w.r.t. FOR would be $V_{tw} = V - V_e$ and the centrifugal force would be $F_{tw} = m\times\left(g - \frac{V_{tw}^{\,2}}{R}\right)$. In each of the cases R remains unchanged. The subtrahend in F_{tw} is since larger than the subtrahend F_{te}, and hence, $F_{te} < F_{tw}$, and hence answer would be **option (b).**
I-02	Force Diagram and Free Body Diagrams (FBD) of the Two arrangements(i) ad (ii) are as under -  **Force Diagram Free Body Diagram Arrangement in Fig (i)** **Force Diagram Free Body Diagram Arrangement in Fig (ii)** Writing Force Eqn. for arrangement in Fig.(i) for mass $2m$ is $2mg - T = 2ma \rightarrow T = 2m(g-a)$ and for mass m would be $mg - T = -ma \rightarrow T = m(g+a)$ Using these Two Eqns. for T, $2m(g-a) = m(g+a) \rightarrow g = 3a \rightarrow a = g/3$. While, for in Fig. (ii) for mass m is $mg - F = -ma' \rightarrow 2mg = m(g+a') \rightarrow a' = g$ i.e. $a' > a$. Thus answer is **Option (b).**
I-03	Let the ball is on a horizontal circular path of radius r and string makes angle θ with vertical line of suspension, and string is under tension T. By geometry of circular pendulum $sin\theta = \frac{r}{L}$. Then in condition of uniform circular motion, while vertical component T will cancel out since $T\cdot cos\theta = mg$. And horizontal components of T would bed $\cdot sin\theta = mr\omega^2 \rightarrow mL\,sin\theta\,\omega^2 \rightarrow T = mL\omega^2 \rightarrow mL\cdot sin\theta\,\omega^2 \rightarrow T = mL\omega^2$. Thus with limiting values of T, and that of m and L, limiting value of angular velocity would be $\omega = \left(\frac{T_{max}}{ML}\right) = \sqrt{\frac{324}{0.5\times0.5}} = \sqrt{324\times4} = \sqrt{81\times16}\} = 36$. Thus answer is **Option (b).** 
I-04	Under gravity the block would tend to slip down with gravitational pull parallel to the plane $= mg\cdot sin\theta - f$. Here, f is the force of friction and θ is angle on inclination of the plane. This motion can be retarded with a force P as given. When the block is just prevented from sliding down $P = P_1$, the block would tend to slide down and hence force friction $f = mg\cdot sin\theta - P_1$. It shall be in the upward direction i.e. opposite to the direction tending to be in motion and shall be parallel to P i.e. (+ve). As, P is increased frictional force $f \rightarrow 0$. Thereafter, it will have tendency to slide up, thereby reversing direction of frictional force against direction of motion till $P_2 = mg\cdot sin\theta + f$. Thus, f will become (-)ve. Answer

	is **Option (a).**
I-05	Wire frame in shape of parabola is given to be $y = kx^2$. The frame exerts a force ma on the bead which in turn as per Newton's Third Law of Motion (NTLM) exerts a reaction $-ma$ as shown in the figure. For the bead to stay in any position, without sliding, it is essential that components gravitational force (mg) and reaction $-ma$ should be zero. It leads to $mg \cdot \cos\theta + (-ma)\cos\left(\frac{\pi}{2} - \theta\right) = mg \cdot \cos\theta - ma \cdot \sin\theta = 0 \rightarrow \tan\theta = \frac{g}{a}$ ..(a)  Slope of wire at the point is $\frac{dy}{dx} = \frac{d}{dx} \cdot kx^2 = 2kx = \tan(\pi + \theta) = -\cot\theta \rightarrow \tan\theta = -\frac{1}{2kx}$ ... (b). Equating values of $\tan\theta$ from Eqns. (a) and (b) $\frac{g}{a} = -\frac{1}{2kx}$. It leads to $x = \frac{a}{2kg}$. Hence answer is **Option (b).**
I-06	Slope of $\vec{p}$ is $\tan\theta_p = -\frac{\sin kt}{\cos kt}$. Further, Force $\vec{F} = \frac{d}{dt}\vec{p} = kA(-\sin kt\ \hat{\imath} - \cos(kt)\hat{\jmath}) \rightarrow \tan\theta_F = \frac{\cos kt}{\sin kt}$. Since $\tan\theta_p \cdot \tan\theta_F = \left(= -\frac{\sin kt}{\cos kt}\right)\left(\frac{\cos kt}{\sin kt}\right) = -1$. This is the condition for the Two vectors being orthogonal it $\left|\theta_p - \theta_F\right| = 90^0$. Hence answer is **Option (d)**
I-07	Qn. No 41, on Kinematics in set *Code:Phy/Kinx/O/001* is apparently similar to this. There in illustration to the answer used geometrical identity by correlating x and y with given a; this approach worked since correlation of velocities is associated with displacements, a geometrical entity, but it would be incorrect to apply it here. In the instant case, it is related to correlation of forces and hence, it has to be analyzed with force equations. Further, the Two equal masses m placed symmetrically, it leads to $F = 2mg = 2T\sin\theta \rightarrow T = \frac{F}{2\sin\theta}$. Moreover, along the line joining the Two masses $T\cos\theta = m\frac{dx}{dt} \rightarrow T = \frac{m}{\cos\theta} \cdot \frac{dx}{dt}$. Equating the Two values of T, it leads to $\frac{F}{2\sin\theta} = \frac{m}{\cos\theta} \cdot \frac{dx}{dt} \rightarrow \frac{dx}{dt} = \frac{F}{2m} \cdot \cot\theta = \frac{F}{2m} \cdot \frac{x}{y}$. Expressing y geometrically $y = \sqrt{a^2 - x^2}$, it would be $\frac{dx}{dt} = \frac{F}{2m} \cdot \cot\theta = \frac{F}{2m} \cdot \frac{x}{\sqrt{a^2 - x^2}}$. Thus answer is **Option** (b).  ***N.B.:*** *Such fine nuances in principles, despite problems appearing similar are often encountered. Therefore, it is extremely essential to analyze the question before one proceeds with wrong concepts and consequently ends up with wring answer.*
I-08	 FBD of the Two masses suspended from spring, in steady-state is shown in the figure on the left. Accordingly in steady state force equation for B would $T_{st} = mg$ and for A would be $T_{st} = T_{st} + 2mg \rightarrow T_{st} = mg + 2mg \rightarrow T_{st} = 3mg$. But, as soon as the string is cut the FBD of the Two masses shall become independent for motion and the FBD in new case is as shown in the figure on the right. Accordingly, force equation for A would be $T_{sp} - 2mg = 2ma \rightarrow 3mg - 2mg = 2ma \rightarrow mg = 2ma \rightarrow a = \frac{g}{2}$. Thus acceleration of mass A is $\frac{g}{2}$. Whereas, for mass B, T_{st} would disappear as soon as the string is cut. Hence, it will make a free fall under gravity and hence its acceleration would be g.  Accordingly, accelerations of A and B are $\frac{g}{2}$, g . Hence answer is **Option (b)**.
I-09	At the maximum height that insect can crawl shall be a state of equilibrium and hence as per force equations $N = f_n = mg\cos\alpha$, hence frictional force that shall prevent the slipping down of the insect shall be $f = \mu mg\cos\alpha$. Whereas, the force that shall cause slipping is tangential component of ravitational pull $f_t = mg\cos\left(\frac{\pi}{2} - \alpha\right) = mg\sin\alpha$. At the state of equilibrium $f = f_t \rightarrow \mu mg\cos\alpha = mg\sin\alpha \rightarrow \cot\alpha = \frac{1}{\mu}$. With the given value of μ, it would lead to $\cot\alpha = 3 \rightarrow \cot^{-1}3$. Hence, answer is **Option (a).** 
I-10	Since system is symmetrical about vertical line passing through mass $\sqrt{2}m$ and the Two strings joint. Therefore, horizontally it will be in equilibrium. And for vertical equilibrium necessary condition is $2T\cos\theta = \sqrt{2}mg$. Further, for equilibrium of masses m, the condition is $T = mg$. Combining these equations, $2mg\cos\theta = \sqrt{2}mg \rightarrow$

	$\cos\theta = \frac{\sqrt{2}}{2} = \frac{1}{\sqrt{2}} \rightarrow \theta = \cos^{-1}\frac{1}{\sqrt{2}} \rightarrow \theta = 45^0$. Thus answer is **Option (c).** 
I-11	In the state of equilibrium $T = Mg$. And at the point of clamp where pulley is supported, vertical force shall be $F_v = T + mg = Mg + mg = (M+m)g$. Further horizontal pull shall be $F_h = Mg$. Hence, vreaction offered by clamp on the pully shall be vector addition of perpendicular forces F_h and F_v i.e. $\vec{F} = \vec{F}_h + \vec{F}_v$. Thus magnitude of net force offered by clamp on pully shall be $F = \left\|\vec{F}\right\| = \sqrt{{F_h}^2 + {F_h}^2} = \sqrt{(M+m)^2 + M^2}\cdot g$. Thus answer is **Option (d).** 
I-12	The tangential acceleration of the bead place at a distance L from axis of its rotation, when the rod is set in an angular acceleration α, is $a = L\alpha$. Thus a normal recation offered by rod is $N = mL\alpha$, therefore frictional force between the rod and the bead is $f = \mu mL\alpha$. And the centrifugal force would be $f_c = mL\omega^2$. At the instant when the bead is about to slip $f = f_c \rightarrow \mu mL\alpha = mL\omega^2|_{r=L} \rightarrow \omega = \rightarrow \sqrt{\mu\alpha}$. From a state of rest time taken by the rod to acuquire angular velocity ω, as per Galelio's Fist Equation would be $\omega = \alpha t \rightarrow t = \frac{\omega}{\alpha} = \frac{\sqrt{\mu\alpha}}{\alpha} \rightarrow \sqrt{\frac{\mu}{\alpha}}$. Thus answer is **Option (a).** 
I-13	Normal force N is reaction by the surface of wall and hence $F = N$, accordingly, frictioonal force shall be $f = \mu N = 0.5 \times 5 = 2.5N$. But, threshhold value static friction (maximum) is equal to force tending to displace it. In he instant case posible displacement is vertical and hence $f_{max} = mg = 0.1 \times 9.8$ N, it is equal to fricttional force acting on the block. Hence,answer is **Option (b)**. ***N.B.:*** *Since value of g is not given, in competitve tests generally it is given, and therefore chossing it* $10\ ms^{-1}$*, would lead to* $f_{max} = 1 \approx 0.98$*, and would not change the answer.* 
I-14	The car, a non-inertail frame, is under ceptrepetal force buy virtue of it circular motion and according bob would experience a radial inward centrepetal force $f_{cp} = -m\frac{v^2}{r}$. Since, the bob remain suspended in equilibrum there would be corresponding radially outward centrifugal force $f_{cf} = m\frac{v^2}{r}$. The bod, which is suspended by strin is also vertical equilibrium, is acted upon Two forces tension in the string T and gravitatonal force mg. Resolving Tension T along radial for radial equilibrium $f_{cp} = -m\frac{v^2}{r} = -T\sin\alpha$, likewise along certical direction $mg = T\cos\alpha$. Combining Two equation $\tan\alpha = \frac{m\frac{v^2}{r}}{mg} = \frac{v^2}{rg} = \frac{10^2}{10\times10} = 1 = \tan 45^0$. Hence answer is **Option (c).** ***N.B.: Zoom-in the figure as required*** 
I-15	Since resistance is negligible hence $F = Ma \rightarrow 5 \times 10^4 = 3 \times 10^7 \times a \rightarrow a = \frac{5}{3} \times 10^{-3}$. Therefore, speed of the ship after being pulled over a distance of 3m from a state of rest can be obtained from Galeilio's Second Eqn of Motion $v^2 = u^2 + 2as \rightarrow v^2 = 0 + 2 \times \frac{5}{3} \times 10^{-3} \times 3 = 10^{-2}$. It leads to $v = 10^{-1}$ ms^{-1} = 0.1 ms^{-1}. Hence answer is **Option (c).** 

I-16	Solution to this problem is simple based on energy equivalence and potentail energy of mass at P $(= mgh)$ is utilized in overcoming friction and particle comes to rest. Further, given that energy lost in track PQ $= \frac{1}{2}mgh$. Thus, force analysis on this portion of the track, as shown in figure, is redundant. On track QR retardation force is $f' = \mu N' = \mu mg$. Hence energy lost in track QR $= \frac{1}{2}mgh = f'x = (\mu mg)x$. It leads to $\frac{1}{2}h = \mu x \rightarrow \mu x = \frac{1}{2} \times 1 = 1$. This is achieved nearest with values of μ and x at (b), hence answer is **Option (b).** 
I-17	Block A ahall experience forces F and N in horizonatl direction such that $F = -N$, while in vertical direction 20N due to gravity balanced by $20 = -f_1 = -\mu_1 F$, where f_1 is tending to avoid slip of the block. As regards Block B horizontal forces are same as that on Block A, but equilibrium of vertixal forces is $100 + f_1 = f_2 \rightarrow f_2 = 100 + 20 = 120$ N, here $f_2 = -\mu_2 N$, but information on μ_2 is redundant. Thus answer is **Option (b)** ***N.B.:*** *Questions may at times contain redundant information and they must be identified correctly and thus solution going complex, can be avoided.* 
I-18	During pushing an object its velocity is consdered to be negligible and hence frictional force would be at its threshhold value i.e. $f = \mu N$. Hence, when force is applied then $f_A = F_A \cos 30^0 = \mu(mg + F_A \sin 30^0) \rightarrow \frac{\sqrt{3}}{2}F_A = \frac{\sqrt{3}}{5}\left(mg + \frac{1}{2}F_A\right) \rightarrow \frac{1}{2}\left(1 - \frac{1}{5}\right)F_A = \frac{1}{5}mg \rightarrow \frac{2}{5}F_A = \frac{1}{5}mg \rightarrow F_A = \frac{1}{2}mg$. Likewise, for $f_B = F_B \cos 60^0 = \mu(mg + F_B \sin 60^0) \rightarrow \frac{1}{2}F_B = \frac{\sqrt{3}}{5}\left(mg + \frac{\sqrt{3}}{2}F_B\right) \rightarrow \frac{1}{2}\left(1 - \frac{3}{5}\right)F_B = \frac{\sqrt{3}}{5}mg \rightarrow \frac{1}{5}F_B = \frac{\sqrt{3}}{5}mg \rightarrow F_B = \sqrt{3}mg$. Therefore, $\frac{F_A}{F_B} = \frac{\frac{1}{2}mg}{\sqrt{3}mg} = \frac{1}{2\sqrt{3}}$. Answer is **Option (d)** 
I-19	Let, position of the mass m where it can be placed without slipping be (x, y), where maximum height of climb shall be y. At this point tangential component of gravitational force is equal to frictional force such that $mg\cos(90^0 - \theta) = \mu N \rightarrow mg\sin\theta = \mu mg\cos\theta \rightarrow \mu = \tan\theta$. Further from coordinate geometry slope of tangent at a point on a curve is $m = \frac{d}{dx}y = \frac{d}{dx}\left(\frac{x^3}{6}\right) = \frac{x^2}{2} = \tan\theta$. Equating the Two values of $\tan\theta$ it leads to $\mu = \tan\theta \rightarrow 0.5 = \frac{x^2}{2} \rightarrow x = 1$. Using this value of x, maximum height of the mass, without slipping, shall be $y = \frac{1^3}{6} = \frac{1}{6}$m. Hence answer is **Option (c).** 
I-20	With the given data $\Delta\vec{v} = (6\hat{j}) - (6\hat{\imath} - 2\hat{\jmath}) = -6\hat{\imath} + 8\hat{\jmath}$. Therefore force acted upon the block $\vec{F} = m \cdot a = m \cdot \frac{\Delta\vec{v}}{\Delta t}$. It is given that $\Delta t = 10$ s, therefore, $\vec{F} = 5 \cdot \frac{-6\hat{\imath}+8\hat{\jmath}}{10} = -3\hat{\imath} + 4\hat{\jmath}$.nce answer is **Option (b).**
I-21	Force diagram of the problem is shown in figure where Vertical component of tension in the string would be balaned by weight i.e. $T \cdot \cos\theta = W$ and $T = W \cdot \sec\theta$. With the given geometry, $\sec\theta = \frac{(8+5)}{\sqrt{(8+5)^2 - 5^2}} = \frac{13}{12}$. Hence, answer is **Option (d).** 

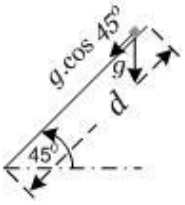
I-22



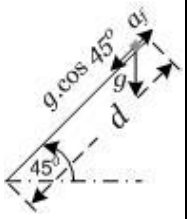
Position vector of particle in polar coordinates is $R\angle\theta$, and since options are given in cartesian coordinates and hence $\vec{R} = R\cos\theta\,\hat{\imath} + R\sin\theta\,\hat{\jmath}$, therefore velocity vector shall be $\vec{V} = \frac{d}{dt}\vec{R} = \frac{d}{dt}(R\cos\theta\,\hat{\imath} + R\sin\theta\,\hat{\jmath})$. It leads to $\vec{V} = R\left(-\sin\theta\frac{d\theta}{dt}\hat{\imath} + \cos\theta\frac{d\theta}{dt}\hat{\jmath}\right)$. Since, $V = R\frac{d\theta}{dt} = R\omega$ hence, $\vec{V} = R\omega(-\sin\theta\,\hat{\imath} + \cos\theta\,\hat{\jmath})$. And accelertaion is $\vec{a} = \frac{d}{dt}\vec{V} = \frac{d}{dt}\left(R\omega(-\sin\theta\,\hat{\imath} + \cos\theta\,\hat{\jmath})\right)$. It further comes to $\vec{a} = R\omega\left(\frac{d}{dt}(-\sin\theta\,\hat{\imath} + \cos\theta\,\hat{\jmath})\right) = R\omega\left(-\cos\theta\frac{d\theta}{dt}\hat{\imath} - \sin\theta\frac{d\theta}{dt}\hat{\jmath}\right)$. It calculates to

$\vec{a} = R\omega(-\omega\cdot\cos\theta\,\hat{\imath} - \omega\cdot\sin\theta\,\hat{\jmath}) = -R\omega^2(\cos\theta\,\hat{\imath} + \sin\theta\,\hat{\jmath}) = -R\left(\frac{V}{R}\right)^2(\cos\theta\,\hat{\imath} + \sin\theta\,\hat{\jmath}) = -\frac{V^2}{R}(\cos\theta\,\hat{\imath} + \sin\theta\,\hat{\jmath})$. Thus answer is **Option (c).**

I-23



A smooth block when slides down a distance d on a 45^0 incline, therefore effective acceleration shall be $a = g\cos 45^0 = \frac{g}{\sqrt{2}}$. Thus effecive time of slide over a distance d is as per Galelio's First Equation of Motion shall be $d = 0 + \frac{1}{2}at^2 = \frac{g}{2\sqrt{2}}t^2 \rightarrow t = \sqrt{\left(2\sqrt{2}\frac{d}{g}\right)}$. Now when it slides on a rough incline, having coefficent of friction as μ, frictional retardation shall be $a_f = \mu\left(\frac{g}{\sqrt{2}}\right) = \frac{\mu g}{\sqrt{2}}$. Thus, effective acceleration shall be $a' = a - a_f = \frac{g}{\sqrt{2}} - \frac{\mu g}{\sqrt{2}} = \frac{g}{\sqrt{2}}(1-\mu)$. Accordingly time taken on rough surfaceshall beTherefore, time taken to cover a distance d is as per Galelio's Second Equation shall be $d = \frac{1}{2}a'\,t'^2 \rightarrow t' = \sqrt{\frac{2d}{a'}} = \sqrt{\frac{2d}{\left(\frac{g}{\sqrt{2}}(1-\mu)\right)}} \rightarrow$



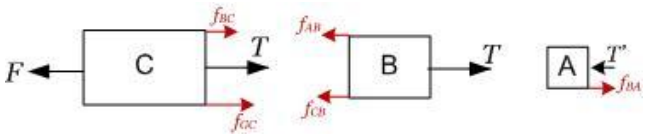
$t' =$. It is given that $\frac{t'}{t} = n$. It leads to $n^2 = \frac{2\sqrt{2}\frac{d}{g(1-\mu)}}{2\sqrt{2}\frac{d}{g}} = \frac{1}{1-\mu}$. This can be further solved usin proprties of ratio-proportion and accordingly,

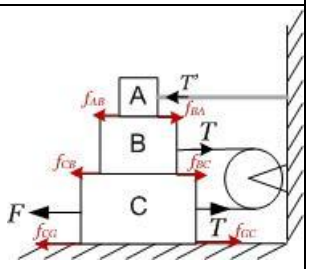
$\frac{1-\mu}{1} = \frac{1}{n^2} \rightarrow -\mu = \frac{1-n^2}{n^2} \rightarrow \mu = 1 - \frac{1}{n^2}$. Since, it a case of sliding and hence $\mu \rightarrow \mu_k$, accordingly it would be $\mu_k = 1 - \frac{1}{n^2}$. Accordingly, answer shall be **option (a).**

N.B.: *This is an excellent example of patience in handling variables, with proper care, works so well that most of them cancel out, and resulting expression is easy to reduce in its simplext form.*

I-24

Force diagram of the system is shown in the figure where $f_{AB} = f_{BA} = \mu M_A g = 0.25 \times 3 \times 10 = 7.5$ N. Likewise, $f_{BC} = f_{CB} = 0.25 \times (4+3) \times 10 = 17.5$ N and $f_{BG} = 0.25 \times (8+4+3) \times 10 = 37.5$ N. Frictional forces acting on each of the masses is shown. Tension T along the string shall be unifrm

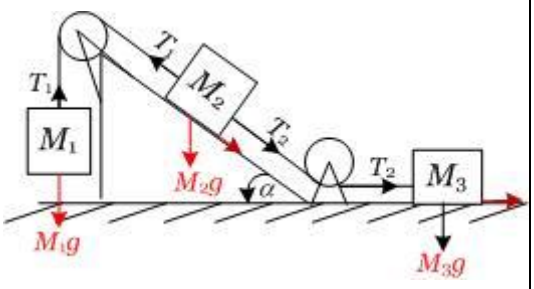




FBD are also shown in the figure and analysis is strated from force F external to the system and each mass is analyzed independently. Thus, for equilibrium of mass C, $F = T + f_{GC} + f_{BC} = T + 37.5 + 17.5 = (T + 55)$ N. Likewise for mass B, force equation is $T = f_{AB} + f_{cB} = 17.5 + 7.5 = 25$ N. And for mass A $T' = f_{BA} = 7.5$ N, this equation is redundant since mass A is not moving. Using, eralier Two equation $F = 55 + 25 = 80$ N. Hence, answer **is option (c).**

I-25

The force diagram of the given system is explicit and hence going forward FBD has been skipped. Given that mass M_1 is moving downwards with uniform velocity it implies $T_1 = M_1 g$. Since all mases are connected with inestensible strings and hence M_2 and M_3 shall also be moving with uniform velocity and thus shall force equation balanced along the line of motion. Accordingly, $T_1 = T_2 + M_2 g\cos(90^2 - \alpha) + f_1 \rightarrow M_1 g = T_2 + M_2 g\sin\alpha + \mu M_2 g\cos\alpha \rightarrow M_1 g = T_2 + M_2 g(\sin\alpha + \mu\cos\alpha)$. Likewise for mass M_2, force equilibrium is $T_2 = \mu M_3 g$. It leads to $M_1 g = \mu M_3 g + M_2 g(\sin\alpha + \mu\cos\alpha) \rightarrow M_1 = \mu M_3 + M_2(\sin\alpha + \mu\cos\alpha) \rightarrow M_1 = 0.25 \times 4 + 4(0.6 + 0.25 \times 0.8) = 1 + 4 \times 0.8 = 4.2$ kg. And, tension in horizontal portion of the string is $T_2 = 0.25 \times 4 \times 10 = 10$ kg. Hence, answer is **Option (d).**



Theme Song :

**PREMISE:*We are pleased to adopt a song*" इतनीशक्तिहमेंदेनादाता....."*from a old Hindi Movie Do Aankhen Barah Haath दोआँखेंबारहहाथof year 1957, directed by The Late V. Shantaram. The lyrics are by Shri Bharat Vyas, singer Melody Queen Sushri Lata Mangeshkar, and Music Direction by Vasant Desai. It has become a widely accepted inspirational song and/or prayer in many educational institutions and socially inspired initiatives engaged in mentoring of unprivileged children. This newly formed non-organizational initiative, being selflessly operated by a small set ofcompassionate 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 ||

Together **E**ach **A**chieves **M**ore
(**TEAM**)

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