

The mentors **Digest**



NOVEMBER 2024

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The mentors monthly magazine

Time to change the way.....



Our Founder & his Vision

Knowledge is the prime wealth among all wealths. In other words, knowledge is the best and important wealth among all wealths. Start your journey to find or explore the knowledge. Our founder and renowned scholar late Padmashri Dr Vellayani Arjunan's vision is to spread quality education to entire community and make it affordable.



Shri. Vellayani Arjunan was born on 10 February 1933 at Vellayani in the erstwhile Kingdom of Travancore. After receiving a Master of Arts degree in Malayalam, he went on to teach Malayalam Language and Literature at

Sree Narayana College in Kollam. He later became the first Malayalam lecturer in Aligarh Muslim University, from which he gained his PhD degree in 1964. After leaving Aligarh Muslim University, he was appointed director of the State Institute of Encyclopaedic Publications in Kerala

He was honoured with the Padma Shri award by the nation in 2008. Dr Arjun, who was the first Professor of Malayalam at the Aligarh University and head of the Department of Modern Indian Languages. He supervised 20 research scholars and published more than 100 research papers and articles. He had authored 40 books in different genres including poetry, short story, essays and literary criticism, and his books were prescribed as textbooks in Kerala schools from 1959 onwards.

Degree	Topic	Awarding Institution
D.Litt.	Influence of Sree Narayana Guru on Malayalam Poetry.	Aligarh Muslim University
D.Litt.	A Comparative Study of the Mutual Relations and Uniformity of Hindi and Malayalam Languages.	Agra University
D.Litt.	The influence of Hindi Vocabularies on the South Indian Languages: A Linguistic study.	Jabalpur University
Ph.D.	A Comparative Linguistic Study of Common Vocables of Hindi and Malayalam Languages.	Aligarh Muslim University

Other degrees

Degree	Subject
B.A. Hons	Malayalam Language and Literature
M.A.	Malayalam Language and Literature
M.A.	Hindi Language and Literature
M.A.	Hindi Special
P.G. Diploma	Tamil, Telugu, Kannada





From the Editors Desk.....

Dear Students & future leaders,

By now, the well-known proverb “necessity is the mother of invention” has been proven true time and again—to the point of becoming a cliché.

A Chinese startup has unveiled a new battery that it claims can generate electricity for 50 years without charging or maintenance. Beijing-based Betavolt said its nuclear battery is the first in the world to realise the miniaturisation of atomic energy, placing nickel-63 isotopes into a module smaller than a coin. The company said the next-generation battery had already entered the pilot testing stage and will eventually be mass produced for commercial applications like phones and drones.

A Chinese startup, Betavolt, has developed a nuclear battery that can last 50 years without charging or maintenance. This miniaturized atomic energy battery, smaller than a coin, could revolutionize power supply in various fields, including medical devices and consumer electronics like phones and drones.



WHAT IS SPECIAL ABOUT THE MONTH OF NOVEMBER ?

NOVEMBER 19 : International Men’s Day, observed annually on November 19, celebrates the positive value men bring to the world, their families, and communities. It highlights the importance of men’s mental health, well-being, and positive role models, while also promoting gender equality. The day aims to address issues that affect men uniquely, including high suicide rates, health challenges, and societal pressures. Established in 1999 by Dr. Jerome Teelucksingh in Trinidad and Tobago, International

Men’s Day encourages conversations around responsible masculinity and mental health. Its six pillars include promoting positive male role models, celebrating men’s contributions, focusing on men’s health and well-being, highlighting discrimination against men, improving gender relations, and creating a safer, better world. Celebrations vary worldwide, often including events, educational programs, and discussions to raise awareness of issues affecting men and boys. While acknowledging men’s achievements, International Men’s Day also encourages empathy and respect across genders, recognizing that a healthier understanding of masculinity benefits everyone in society.





FLIGHT OF THE FUTURE: HOW BATTERY-POWERED PLANES AND HYDROGEN FUEL COULD TRANSFORM AVIATION

Battery-powered planes are here, marking a new era in green aviation. However, the journey toward net-zero air travel is complex and challenging. Aircraft like the Pipistrel Velis Electro are spearheading zero-emission short flights, ideal for training and regional trips. The Velis Electro, powered by a liquid-cooled, lightweight battery, demonstrates impressive efficiency and reliability. But these planes, limited by current battery capacity, can't cover medium- or long-haul routes, which make up the majority of aviation's carbon emissions.

Still, electric planes could pave the way for more scalable solutions, particularly hydrogen. Hydrogen-powered aircraft, like Airbus's ZEROe concept and ZeroAvia's prototype, show potential as hydrogen fuel cells can power larger engines or be burned for thrust, emitting only water. However, switching to hydrogen requires a full-scale overhaul of existing planes and infrastructure—a massive endeavor for the industry. Beyond electric and hydrogen planes, biofuels, electrofuels, and alternative fuels add possibilities, each with its own benefits and constraints. Biofuels require significant agricultural land, while electrofuels demand extensive renewable energy for production. This likely means aviation's future won't rely on a single solution but rather a combination of technologies to reach net-zero.

Battery-powered planes are proving essential to sustainable aviation's future. But to make green flights the norm, a multifaceted approach, embracing everything from hydrogen fuel to advanced biofuels, will be critical. The age of zero-emission aviation has taken off, but the runway to a carbon-free sky stretches far beyond what we've yet achieved.

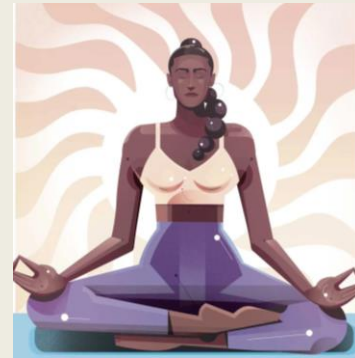


Did you know ?
One is the only number that is spelt with letters arranged in descending order.



BEAT ANXIETY WITH THESE 8 POWERFUL, SCIENCE-BACKED STRATEGIES

Anxiety can be overwhelming, but there are simple, effective ways to take control of your mind. Whether you're facing momentary unease or dealing with ongoing anxiety, here are eight actionable strategies to help bring calm and balance:



QUICK CALMING TECHNIQUES

1. Distance Your Thoughts

Don't push anxious thoughts away. Instead, acknowledge them. Say: "I am having the thought that..." This helps you stay objective and less overwhelmed.

2. Ground Yourself

Focus on your surroundings. Identify:

- 5 things you see
- 4 things you feel
- 3 things you hear
- 2 things you smell
- 1 thing you taste

3. Regulate Your Breathing

Try "box breathing": inhale for 4 seconds, hold for 4, exhale for 4, pause, then repeat. This soothes your body and mind.

4. Set a 'Worry Window'

Reserve 30 minutes daily to confront worries. If anxious thoughts arise, remind yourself you'll address them later.

LONG-TERM ANXIETY MANAGEMENT

1. Face Your Fears Gradually

Take small steps to confront fears, like imagining a situation or trying low-stress versions of anxiety triggers.

2. Exercise Regularly

Physical activity reduces anxiety by offering both a mental distraction and a controlled environment to experience a racing heart without panic.

3. Limit Caffeine

Caffeine can heighten anxiety symptoms. Reducing intake can make a significant difference.

4. Shift Your Mindset

View anxiety as temporary and manageable, not a permanent part of you. Embracing this "growth mindset" builds resilience and reduces stress.

Even small changes to your routine can reduce anxiety and help you find more balance in your daily life.



WHY BEES ARE AMONG EARTH'S MOST INTELLIGENT CREATURES

Bees, key to pollination, are crucial to Earth's ecosystems and human food security. Of the 20,000 species worldwide, most are solitary, but honeybees and bumblebees live in complex colonies. Despite declining populations—largely due to habitat loss, pesticides, and climate change—bees remain vital to pollinating crops like coffee, cocoa, and numerous fruits.

Bee Intelligence

Bees exhibit impressive cognitive abilities:

- Counting: Studies show bees use counting to navigate, landing based on landmark numbers.
- Problem-solving: Bees solve puzzles, like rotating tabs to reach rewards, and can learn from others.
- Tool Use: Asian honeybees apply animal feces around their nests to deter hornets—a rare instance of wild tool use.

Communication & Navigation

Honeybees use the "waggle dance" to signal food location, with the dance duration indicating distance and body orientation signaling direction. Additionally, bees rely on the Sun and Earth's magnetic fields to navigate miles, even on cloudy days.

Evolution and Ecological Impact

Bees, evolved from wasps in the Cretaceous Period, helped drive the development of flowering plants in a cycle of coevolution. They pollinate nearly 80%

of Europe's wildflowers and a third of global food crops. Without bees, both food security and ecosystems would suffer.

Bee-friendly Gardens

To support bee populations, plant varied flora like lavender, marigolds, and specialized plants for rare bee species. Letting lawns grow wild also provides food sources like dandelions.

Common Myths

1. Bees fly efficiently: Their wings are perfectly designed for flight.
2. Not all bees sting: Only female bees have stingers; some species are stingless.
3. Not all bees die after stinging: This applies only to honeybees.
4. Only a few make honey: Just a fraction of bee species produce honey, and usually in small quantities.
5. Not all bees work hard: Males (drones) mainly mate, while queens and workers do the heavy lifting.

Bees remain vital to Earth's biodiversity, with much of our food and ecosystem health hinging on their survival.





CONCEPT MAP

MATHEMATICS TOPIC OF THE MONTH:

STATISTICS

Class XI

STATISTICS

Measures of Dispersion

Mean Deviation

It is the arithmetic mean of the absolute values of deviations about some point (mean or median or mode).

$$\text{Mean Deviation} = \frac{\text{Sum of Deviations}}{\text{Number of Observations}}$$

For Ungrouped Data

Let x_1, x_2, \dots, x_n be n observations, then mean deviation about mean is given by $M.D.(\bar{x}) = \frac{1}{n} \sum_{i=1}^n |x_i - \bar{x}|$;

Mean deviation about median is given by,

$$M.D.(M) = \frac{1}{n} \sum_{i=1}^n |x_i - M|$$

For Grouped Data

Let x_1, x_2, \dots, x_n be a set of n observations occurring with frequencies f_1, f_2, \dots, f_n respectively, then mean deviation about mean is given by $M.D.(\bar{x}) = \frac{1}{N} \sum_{i=1}^n f_i |x_i - \bar{x}|$;

Mean deviation about median is given by $M.D.(M)$

$$= \frac{1}{N} \sum_{i=1}^n f_i |x_i - M|$$

Here, x_i are the mid-points of classes and $N = \sum_{i=1}^n f_i =$ Sum of frequencies

Shortcut Method

- **About mean** : $M.D.(\bar{x}) = \frac{1}{N} \cdot \sum_{i=1}^n f_i |x_i - \bar{x}|$, where mean, $\bar{x} = a + \frac{\sum_{i=1}^n f_i d_i}{N} \times h$, a is assumed mean, $d_i = \frac{x_i - a}{h}$ and $h =$ size of interval.

- **About median** : $M.D.(M) = \frac{1}{N} \sum_{i=1}^n f_i |x_i - M|$, where median, $M = l + \frac{\frac{N}{2} - cf}{f} \times h$,

N is sum of frequencies, l, f, h and cf are respectively the lower limit, the frequency of the median class, the width of the class interval and the cumulative frequency of the class just preceding the median class.

Analysis of Frequency Distributions

If the given data has mean (\bar{x}) and standard deviation (σ), then

$$\text{Coefficient of variation (C.V.)} = \frac{\sigma}{\bar{x}} \times 100, \bar{x} \neq 0$$

The data whose C.V. is less is said to be more consistent.

Variance and Standard Deviation

Mean of the squares of the deviations from mean is called variance and is denoted by σ^2 .

The positive square root of variance is known as standard deviation. It is denoted by σ .

For ungrouped data	$\sigma = \sqrt{\frac{1}{n} \sum_{i=1}^n (x_i - \bar{x})^2}$
For grouped data	$\sigma = \sqrt{\frac{1}{N} \sum_{i=1}^n f_i (x_i - \bar{x})^2}$
Shortcut method	$\sigma = \frac{h}{N} \left[\sqrt{N \sum_{i=1}^n f_i u_i^2 - \left(\sum_{i=1}^n f_i u_i \right)^2} \right]$ where $u_i = \frac{x_i - a}{h}$, $a =$ assumed mean, $h =$ width of class-intervals

Properties of Standard Deviation

- S.D. is independent of change of origin.
- S.D. is not independent of change of scale.

Combined Variance of Two Series

If n_1, n_2 are the number of elements, \bar{x}_1, \bar{x}_2 are the means and σ_1, σ_2 are the standard deviations of two series respectively, then variance of combined series is

$$\sigma^2 = (\text{S.D.})^2 = \frac{n_1(\sigma_1^2 + d_1^2) + n_2(\sigma_2^2 + d_2^2)}{n_1 + n_2}$$

where $d_1 = \bar{x}_1 - \bar{x}$, $d_2 = \bar{x}_2 - \bar{x}$ and $\bar{x} = \frac{n_1\bar{x}_1 + n_2\bar{x}_2}{n_1 + n_2}$

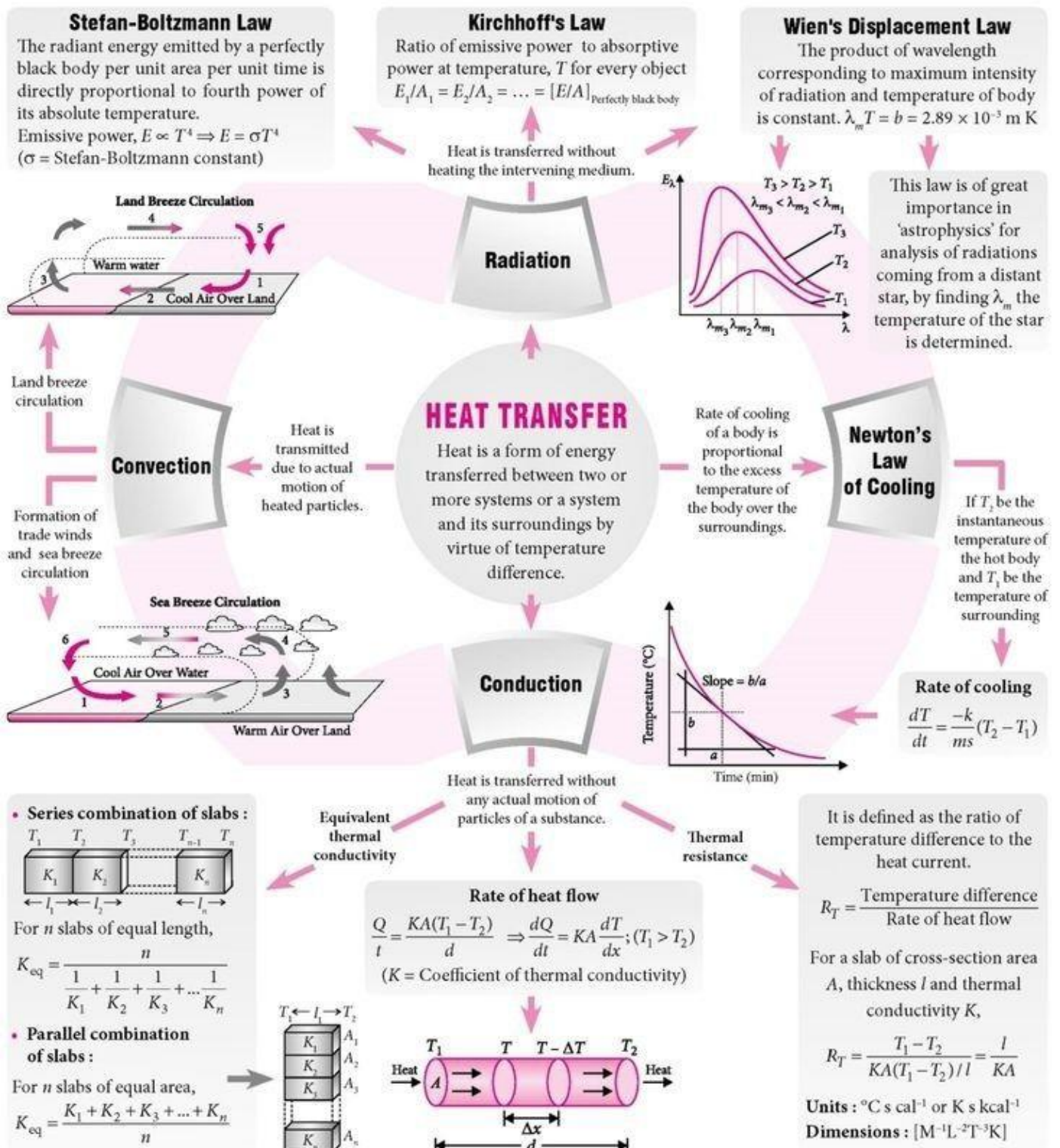


BRAIN MAP

SCIENCE TOPIC OF THE MONTH:

HEAT TRANSFER

Class XI





TWIST YOUR MIND

(Answers will be given in the December 2024 digest)

RIDDLES

1. I am taken from a mine, and shut up in a wooden case, from which I am never released, and yet I am used by almost every person. What am I?
2. I have no beginning. I have no end. I am always present, and always will be. I am essential to all things, yet I am nothing myself. What am I?

PUZZLE



Bright Spots: Positive Events from OCTOBER 2024

- **Chumash Marine Reserve:** Indigenous communities co-manage a new marine sanctuary in California
- **Cervical Cancer Treatment:** New protocols could reduce cervical cancer mortality by 40%
- **RBI Gold Repatriation:** India repatriated 102 tonnes of gold from the Bank of England
- **Garba Event for Survivors:** A Garba celebration was held for 3,000 cancer survivors in Rajkot
- **Bulletproof Jackets:** New advanced jackets for the Indian Army were developed by DRDO and IIT Delhi
- **Braille Constitution:** A Braille version of the Indian Constitution was launched in West Bengal

word
of the
month

Ukiyo : It is a Japanese word meaning “living in the moment. “

OCTOBER ANSWERS

RIDDLES : 1.Kitten 2.Meat

PUZZLE : 19

The mentors Digest



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The mentors Digest



ABOUT US

Affordable Quality education

By understanding the need of aspiring students, India's renowned Industrial & Academic experts Mr. Manoj PL (Refining Specialist, Academician and founder Director Epinox Prompt Consulting Engineering Ltd), Ms. Chitra Jayasankar (Educational advisor, Tagore Educational trust) are there to bridge the gap of ensuring quality education for the students. We have formulated an online platform for providing significantly exceeding educational experience through online tuitions (classes 6-12), IAS bridge programs and finishing school for fresh engineers and other professionals. We will ensure excellent learning experience to students and 100% satisfaction level to parents.

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