



**UPSC
Mentorship**
A Unit of Mentorship India

DAILY CURRENT AFFAIRS

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SOURCES



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GS I

1. Over 70% of Child Deaths in India Linked to Malnutrition

Source: The Hindu

Context: Death rates from malnutrition are much higher in low-income countries, where children often don't get the diversity of nutrients

India: 0.7 million children under five died, with 0.5 million deaths due to child and maternal malnutrition, accounting for over 70% of child deaths.

Global: Of 4.7 million child deaths, 2.4 million were due to malnutrition, representing about 50% of global child deaths, 20 percentage points lower than in India.

Malnutrition and Its Impact:

- **Causes:** Children often die from conditions exacerbated or triggered by malnutrition rather than from malnutrition itself. Malnutrition acts as a risk factor for premature death, contributing significantly to conditions like wasting (low weight for height) and stunting (short height for age).
- **Nutritional Risk Factors:** Low birth weight is a significant risk factor, often resulting from maternal malnutrition or diseases during pregnancy. Postnatal malnutrition increases vulnerability to infections and diseases, contributing to high death rates.

Contributing Factors for improving:

- **Improvements in Nutrition:** Enhanced nutritional intake has driven much of this decline.
- **Disease Control:** Progress in combating infectious diseases has been crucial. Better sanitation, clean water, effective treatments for diseases like malaria and diarrhoea, and widespread vaccinations have significantly reduced disease-related deaths.
- **Support for Mothers and Babies:** Increased support during pregnancy and postnatal care has improved outcomes. More births are attended by skilled health workers, aiding in the management of low birth weight and other complications.

Future Directions:

- **Continued Focus on Nutrition:** While progress has been made, improving the nutrition of children and mothers remains crucial for further reducing malnutrition-related deaths.
- **Addressing Health Conditions:** Tackling diseases and health conditions that disproportionately affect malnourished children will continue to be important in reducing poor health outcomes.

Conclusion:

- The high rate of child deaths linked to malnutrition in India underscores the need for ongoing efforts to improve nutritional standards and health conditions.
- The significant progress made over recent decades is encouraging, but continued focus on both nutrition and disease prevention is essential for further reducing mortality rates.

Chart 1: Number of child deaths in India attributed to various nutritional risk factors

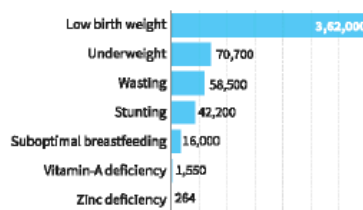


Chart 3: Number of child deaths in India attributed to various nutritional risk factors over time (in million)

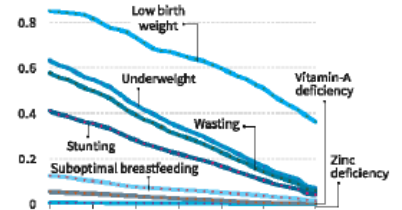
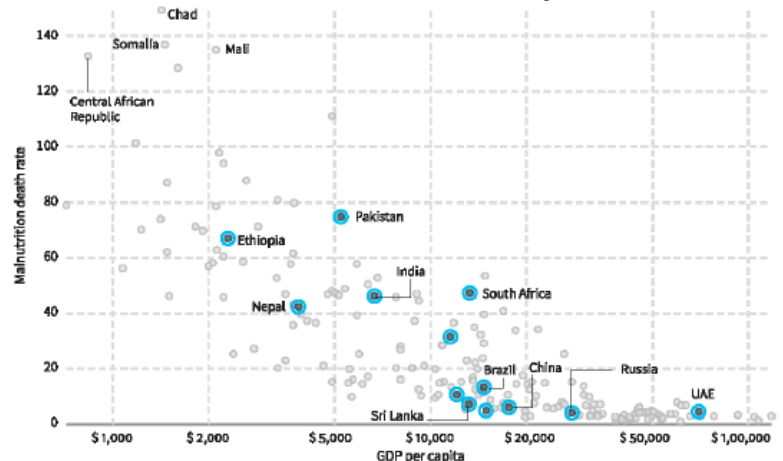


Chart 2: The chart plots country-wise malnutrition death rates (per 100,000 people) against the GDP per capita



GS II

2. India, UAE ink pact for civil nuclear cooperation

Source: The Hindu

Context: India and the UAE signed a landmark MoU for civil nuclear cooperation, the first such agreement between the two nations, enhancing bilateral ties in the nuclear energy sector.

Details of the MoU:

- The MoU was signed between India's Nuclear Power Corporation of India Ltd. (NPCIL) and the Emirates Nuclear Energy Company (ENEC)-led Barakah Nuclear Power Plant Operations and Maintenance.
- The pact was formalised during the visit of Crown Prince of Abu Dhabi, to New Delhi, and follows years of discussions on peaceful nuclear cooperation.

Background and Significance:

- The collaboration builds on the agreement reached in August 2015, during the Indian Prime Minister visit to the UAE, where both nations committed to cooperating in peaceful uses of nuclear energy, including safety, agriculture, and technology.
- This MoU aligns with the UAE's policy of expanding investments in the nuclear energy sector and demonstrates India's growing role in international nuclear energy cooperation.

Trilateral Cooperation Efforts:

- The MoU also stems from discussions between India, the UAE, and France, initiated during a trilateral meeting on the sidelines of the UN General Assembly in September 2022.
- This trilateral framework, which focuses on promoting cooperation in energy sectors like solar and nuclear, was further reinforced through a phone call between the Foreign Ministers of all three countries in February 2023.

Other Agreements Signed:

- Alongside the nuclear cooperation MoU, additional agreements were signed during the Crown Prince's visit:
 - A long-term LNG supply agreement between Abu Dhabi National Oil Company (ADNOC) and Indian Oil Corporation Ltd.
 - A Production Concession Agreement for Abu Dhabi Onshore Block 1 between Urja Bharat and ADNOC.
 - An MoU between the Government of Gujarat and Abu Dhabi Developmental Holding Company PJSC (ADQ) for food parks development in India.

Conclusion:

- The MoU between India and the UAE marks a significant milestone in civil nuclear cooperation, enhancing strategic ties between the two nations.
- The visit also resulted in key energy and infrastructure agreements, reinforcing the strong economic partnership between India and the UAE within the broader framework of multilateral cooperation.



GS III

3.GoM to Decide on Tax on Health, Life Covers Soon

Source: The Hindu

Context: The GST Council is considering reviewing the 18% GST on health and life insurance premiums. A new Group of Ministers (GoM) has been tasked with recommending reductions or removal of the levy within 50 days.

Discussions at GST Council:

- The GST on insurance premiums was thoroughly discussed, with questions raised on whether to lower the rate, remove the levy entirely, or provide exemptions for specific categories, especially group insurance policies.
- The GoM is mandated to review these issues and submit its recommendations before the Council's next meeting in November.

Formation of a New GoM:

- A new GoM will be constituted to focus specifically on the taxation of health and life insurance policies.
- An additional group will deliberate on the future of the GST Compensation Cess, a charge originally levied to compensate States for revenue losses. This levy was extended till March 2026 due to the pandemic-induced dip in cess collections.

Rate Rationalisation and Other Decisions:

- The Council also updated members on a ministerial group's work concerning GST rate rationalisation. This panel will meet to review insurance taxation in its broader context.
- The Council approved rate changes for three cancer drugs, reduced from 12% to 5%, and increased the GST on car seat covers from 18% to 28%.

Implications of the Decision:

- The review of insurance taxation could provide relief to policyholders and address concerns about the affordability of health and life insurance amidst growing demand for such products.
- The deliberations on GST Compensation Cess may also impact automobile and other sectors relying on the cess's removal post-debt repayment.

Conclusion:

- With significant issues on the table, including the future of GST on insurance premiums and the Compensation Cess, the GoM's recommendations could result in major shifts in India's tax landscape.
- The upcoming meeting of the GST Council will be pivotal in determining these changes.

On the table

The GST Council meeting on Monday took decisions on a host of pending issues



Health and Life Insurance premiums:

50-day deadline for a new Group of Ministers (GoM) to go into demand for a reduction in the **18%** levy

Rationalising GST rates and slabs:

Panel to meet on

September 23

to discuss its broader mandate

GST Compensation Cess:



A new ministerial group is being formed to deliberate on the future of the levy on a few select items, including automobiles and demerit goods.



Real estate issues:

GoM has been asked to examine the issue of factoring in the cost of land while assessing the value of construction services in property transactions

UPS AND DOWNS

Tax on three cancer drugs cut from

12% to 5%



Levy on car seat covers up from

18% to 28%

Tax on some extruded savoury snacks go down from

18% to 12%



4. Centre signs ₹26,000-crore contract with HAL for 240 Su-30MKI jet engines

Source: The Hindu

Context: The Defence Ministry has signed a ₹26,000-crore contract with Hindustan Aeronautics Limited (HAL) for 240 AL-31FP aero-engines to power Su-30MKI fighter jets, which will be assembled in India under a licensed agreement with Russia.

Details of the Contract:

- The contract, approved by the Cabinet Committee on Security last week, was signed in the presence of the Defence Secretary and Air Chief Marshal.
- The engines will be manufactured at HAL's Koraput Division and are intended to sustain the operational capabilities of the Indian Air Force (IAF)'s Su-30MKI fleet.

Manufacturing and Indigenisation Plans:

- HAL is set to deliver 30 engines annually over the next eight years, gradually increasing the indigenisation content to 63% by the end of the delivery programme, up from an average of 54%.
- HAL plans to indigenise nearly 1,000 engine parts with the support of India's defence manufacturing ecosystem, including MSMEs, public, and private industries.

Significance for IAF:

- The 240 engines are intended for the continued operation of the Su-30MKI fleet, as the engines have a defined technical life and need replacement after reaching their operational limit.
- Officials clarified that this contract is unrelated to the ongoing aircraft upgrade programme and is specifically for maintaining the Su-30MKI fleet's readiness.

Current Su-30MKI Fleet Status:

- The IAF currently operates 259 Su-30MKIs, of the 272 originally contracted. The government has also approved the procurement of 12 additional jets to replace those lost in accidents.

Conclusion:

- This contract with HAL is a significant step in sustaining the IAF's Su-30MKI fleet, enhancing India's defence capabilities, and promoting indigenisation in aerospace manufacturing.
- With increasing local content in engine production, the deal also boosts India's push for self-reliance in the defence sector.

5. Two anti-submarine warfare vessels for the Indian Navy launched at Cochin Shipyard

Source: The Hindu

Context: The Indian Navy launched two anti-submarine warfare shallow watercraft vessels, the fourth and fifth in a series of eight, at Cochin Shipyard. Designed for coastal defence, these vessels will strengthen the Navy's anti-submarine warfare capabilities.



Details of the Launch:

- The newly launched vessels will be named INS Malpe and INS Mulki after their commissioning.
- The ships, 78 metres long, 11.36 metres wide, and with a draught of 2.7 metres, are capable of a top speed of 25 knots and can endure 1,800 nautical miles at sea.
- With a displacement of about 900 tonnes, the vessels will be equipped with indigenously developed sonar systems for underwater surveillance.



Background and Significance:

- The Ministry of Defence signed a contract with Cochin Shipyard Ltd. in April 2019 to design, construct, and deliver eight vessels, marking a significant step toward strengthening India's coastal defence.
- The new Mahe-class vessels will replace the in-service Abhay-class ASW corvettes and are designed to perform anti-submarine operations, low-intensity maritime missions, mine-laying, and search and rescue operations.

Type of Warship	Description	Examples
Aircraft Carriers	Large ships capable of carrying and launching aircraft.	INS Vikramaditya, INS Vikrant (under construction)
Destroyers	Versatile warships with anti-air, anti-ship, and anti-submarine capabilities.	INS Kolkata, INS Visakhapatnam, INS Imphal
Frigates	Smaller than destroyers, with multi-role capabilities.	INS Shivalik, INS Nilgiri
Corvettes	Compact warships designed for coastal defense and patrol duties.	INS Kamorta, INS Kiltan
Submarines	Submersible vessels used for stealthy underwater operations.	INS Kalvari, INS Arihant
Patrol Vessels	Smaller craft used for patrolling, search and rescue, and other coastal missions.	INS Saryu, INS Sunayna
Mine Countermeasures Vessels	Designed for mine-clearing operations.	INS Nireekshak, INS Karwar
Landing Platform Docks	Amphibious assault ships for launching troops and equipment ashore.	INS Jalashwa, INS Shardul
Offshore Patrol Vessels	Used for patrolling and surveillance in offshore waters.	INS Vikram, INS Vajra
Research Vessels	Ships dedicated to scientific research and oceanographic studies.	INS Sagardhwani, INS Sindhughosh (research variant)

Technical and Armament Details:

- Each vessel is powered by approximately 12 MW of installed propulsion and will be equipped with lightweight torpedoes, ASW rockets, and mines.
- The ships also feature a close-in weapon system and stabilised remote-control guns for enhanced firepower.

Conclusion:

- The launch of INS Malpe and INS Mulki marks a key milestone in India's defence preparedness, as the Navy bolsters its anti-submarine warfare capabilities in response to emerging geopolitical and security challenges.
- The construction of these vessels highlights India's focus on self-reliance and indigenous defence production.

6. In a First, Critically Endangered Elongated Tortoise Spotted in Aravallis

Source: The Indian Express

Context: A critically endangered elongated tortoise (*Indotestudo elongata*) was spotted in Haryana's Damdama area, marking the species' first recorded presence there and highlighting its rare conservation status.

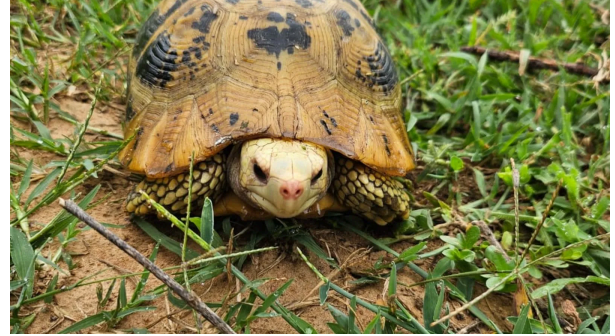


Tortoise Description:

- The elongated tortoise is medium-sized, with a yellowish-brown or olive shell adorned with distinct black blotches at the centre of each scute.
- During the breeding season, it features a pink ring around the nostrils, which is more pronounced in mature individuals of both sexes.
- The tortoise is known for its pinkish colour around the nostrils and eyes during this time.

Habitat and Distribution:

- The tortoise is native to Southeast Asia, spanning northern India, Nepal, Bhutan, Bangladesh, Myanmar, Thailand, Indochina, Guangxi Province in China, and Peninsular Malaysia.
- It primarily inhabits Sal deciduous and hilly evergreen forests, lowlands, and foothills.
- There is also a disjunct population in the Chota Nagpur plateau in eastern India.



Significance:

- **Rare Finding:**
 - The elongated tortoise's presence in the Aravallis is unusual and unexpected as it is not native to the region.
 - The discovery might indicate possible trade introduction rather than natural occurrence.
 - The tortoise's typical habitat includes wetter areas and the foothills of the Himalayas, making its appearance in the Aravallis noteworthy.
- **Conservation Status:**
 - Listed as critically endangered by the International Union for Conservation of Nature (IUCN) in 2018, the elongated tortoise faces severe population declines due to human activities.
 - It is heavily exploited for food and traditional medicine, with widespread hunting and capture by locals.
- **Impact of Human Activities:**
 - Despite a wide distribution, the species has suffered significant population declines due to exploitation.
 - Human activities such as farming and forest resource extraction have further threatened its survival.

The Way Forward:

Further Research Needed:

- There have not been sufficient surveys in the Aravallis to confirm the tortoise's presence as a regular resident.
- The researchers are uncertain about the tortoise's origin and whether it was brought into the region through trade.

7. Superfast Studies of Photoelectric Effect Unlock Secrets of Matter

Source: The Hindu

Context: Researchers are renewing interest in the photoelectric effect, explained by Einstein over a century ago, to advance imaging of proteins, viruses, and materials for next-generation electronics.

Advances in Studying the Effect:

- Researchers now use ultrashort light pulses to study the photoelectric effect on an atomic scale.
- Femtosecond and attosecond pulses (1 attosecond = 10^{-18} seconds) allow scientists to observe extremely short-lived events, such as electrons moving inside an atom.
- Recent studies show that these pulses can reveal detailed information about the electronic structure of matter.

Discoveries:

- In 2023, researchers from SLAC National Accelerator Laboratory reported a significant delay in the emission of electrons from oxygen and nitrogen atoms when struck by X-rays.
- The delay was attributed to phenomena such as shape resonance and the Auger-Meitner effect, where electrons are momentarily trapped by molecular forces.

Impact on Science and Technology:

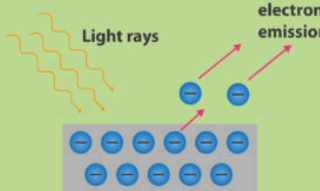
- These findings are crucial for improving imaging technologies used in studying proteins and viruses.
- Understanding electron behaviour at such fine scales can help design new materials for electronics and enhance knowledge of biochemical reactions.

Conclusion:

- These new superfast studies of the photoelectric effect are pushing the boundaries of our understanding of matter.
- As researchers continue to explore this phenomenon, they are likely to uncover insights that will shape future technological innovations.

Photoelectric Effect

The phenomenon of emission of electrons from a metal surface when an electromagnetic wave of suitable frequency is incident on it is called photoelectric effect.

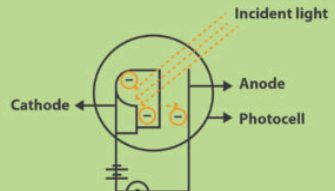


Photoelectric Equation

$E = K_{max} + \phi_0$

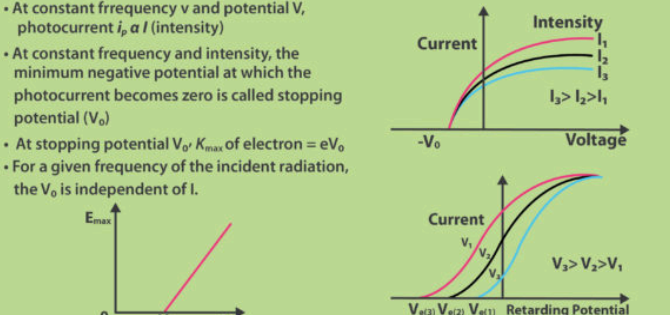
Where ϕ_0 = Work function
E = energy of incident light
 K_{max} = maximum K.E of electron

Photocell



Experimental Study Of Photoelectric Effect

- At constant frequency ν and potential V , photocurrent i_p is $\propto I$ (intensity)
- At constant frequency and intensity, the minimum negative potential at which the photocurrent becomes zero is called stopping potential (V_0)
- At stopping potential V_0 , K_{max} of electron = eV_0
- For a given frequency of the incident radiation, the V_0 is independent of I .



8. Why is the Spread of Mpox is Concern?

Source: The Indian Express

Context: The Democratic Republic of Congo, the center of the mpox outbreak, has received its first mpox vaccine donation nearly a month after the WHO declared it a global health emergency.

Why is the Spread of Mpox a Concern?

- **New Clade Emergence:** The new Ib variant of mpox, which emerged from the original 1970 strain, spreads rapidly and affects more women and children, including through sexual activity.
- **Variants and Transmission:** Mpox has two clades, I and II. Clade I is more virulent, with clade Ib showing increased transmissibility. Research is ongoing to understand the faster spread and demographic impact of this variant.



What Vaccines Are Being Used Against Mpox?

Three mpox vaccines are based on the vaccinia virus, related to the smallpox vaccine:

1. **Modified Vaccinia Ankara (MVA)**: Produced by Bavarian Nordic, approved by the FDA and EMA; received by the DRC.
2. **LC16m8**: Made by KM Biologics, approved only in Japan.
3. **ACAM2000**: Produced by Emergent BioSolutions, recently FDA-approved.

Development of New Vaccines:

- **BioNTech (Germany)**: Developing a new mpox vaccine, currently in early clinical trials.
- **Serum Institute of India (SII)**: Working on a vaccine expected within a year.
- **Indian Council of Medical Research (ICMR)**: Seeking collaborations for developing mpox vaccines and diagnostic kits.

When Should the Mpox Vaccine Be Taken?

- The vaccine is advised for high-risk groups, especially during outbreaks.
- It should be given within four days of exposure to an infected person, with a window of up to 14 days if symptoms have not appeared.

Editorial, Ideas and Opinions

9. Next Census Should Be the Last Enumeration -Based One

Source: The Hindu

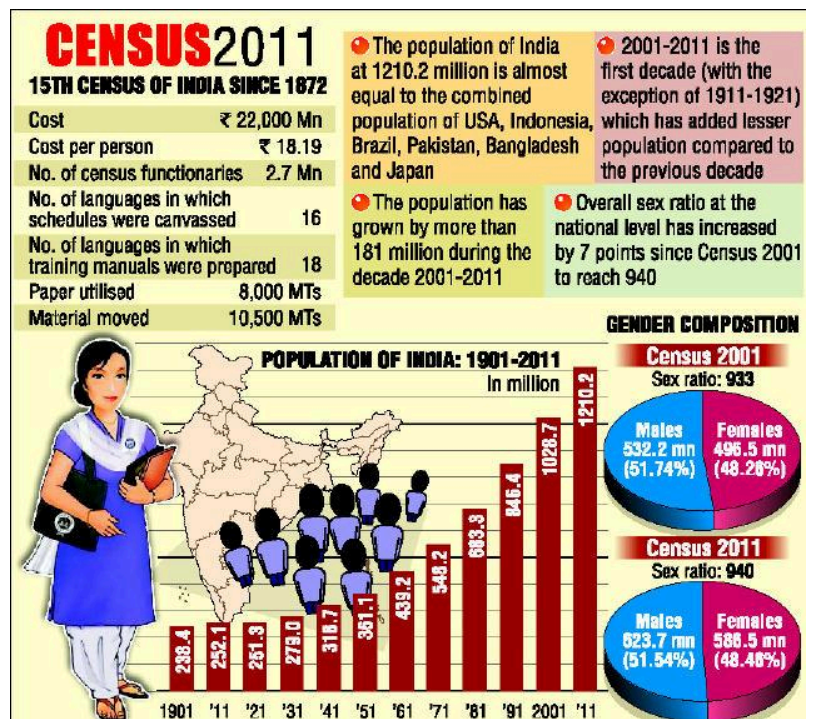
Context: There are strong reasons why India needs to have 'register-based' and 'dynamic' censuses

Current Situation:

- **Delayed Census:**
 - India will begin its Census soon, aiming for completion in 18 months, with the final report due by late 2026 or 2027.
 - This will result in a 16-year gap since the 2011 Census, mainly due to COVID-19 delays.

Challenges with Decennial Censuses:

- **Data Discrepancies:** The long intervals between censuses result in outdated data. A decennial census is costly and cumbersome, leading to a significant gap between actual conditions and available data.



- **Need for Frequent Updates:** More frequent censuses could allow for better policy adjustments and studies in various sectors.

Proposed Solution: Register-Based and Dynamic Censuses

- **Dynamic Census Concept:** A “register-based” system involves continuously updating a central database in real-time. This method could provide more current data than traditional decennial censuses.
- **Previous Initiatives:** India has explored creating a database where events such as births and deaths are automatically updated, integrating with voter registration.

Global Trends:

- **Register-Based Systems:** Countries like Austria, Denmark, and Sweden are using administrative data and small surveys for censuses.
- **Cost Efficiency:** Austria reduced census costs from €72 million in 2001 to €10 million in 2011 with this approach.
- **UK's Method:** The UK uses a dynamic register-based system for continuous updates, replacing the traditional decennial census.

Indian Context and Database Integration:

- **Current Database Integration:** India has initiatives like Aadhaar, PAN, and voter ID databases. However, integrating these into a unified Census database remains a complex task.
- **Potential Benefits:** A register-based system could save costs and provide more timely and accurate data. It could replace traditional surveys with real-time updates, addressing many aspects of socio-economic data collection.

Conclusion:

- **Future Prospects:** Moving towards a dynamic, continuous census system could mark a significant advancement for India, enhancing data accuracy and policy effectiveness.
- Implementing such a system may be one of the major legacies of India's digital transformation efforts.

Recommendation:

- The upcoming Census could be the last traditional enumeration-based one, with future censuses adopting a register-based and dynamic approach for more effective and efficient data collection.



In Brief

10. Why Do Rockets Require Helium?

Source: The Hindu

Context: Recent missions like NASA's Starliner and SpaceX's Polaris Dawn have faced delays due to helium issues, highlighting its critical role in rocket launches. Helium leaks have also impacted past missions such as ISRO's Chandrayaan-2 and ESA's Ariane 5.

Helium's Key Properties:

- **Inert:** Helium does not react with other substances or combust, making it safe to use in rocket systems.
- **Lightweight:** It is the second lightest element after hydrogen, minimising weight and reducing fuel requirements.
- **Low Boiling Point:** At -268.9°C , helium remains a gas in super-cold environments, a crucial property since many rocket fuels are stored at extremely low temperatures.
- **Non-Toxic:** Though it can displace oxygen, helium is generally safe for use.

Roles of Helium in Rockets:

- **Pressurizing Fuel Tanks:** Helium is used to pressurize fuel tanks, ensuring uninterrupted fuel flow to the rocket's engines as fuel and oxidizers are burned. It fills the empty space in the tanks, maintaining pressure.
- **Cooling Systems:** Helium's ability to stay gaseous at low temperatures makes it essential for cooling rocket components.
- **Leak Detection:** Helium's low density allows it to escape through small gaps in storage tanks. These leaks are easy to detect, helping engineers spot potential faults.

Challenges with Helium:

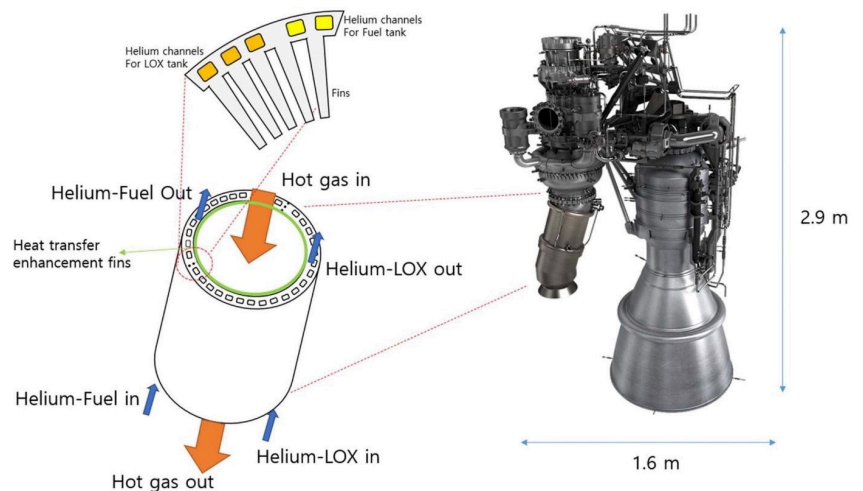
- **Helium Leaks:** Helium's low-density atoms can easily escape through seals and gaps, as seen in Boeing's Starliner mission, where leaks contributed to delays and crew safety concerns. Similar issues have been noted in other missions like Chandrayaan-2.

Alternatives and Industry Response:

- Some engineers have explored using argon and nitrogen, which are also inert and cheaper. However, helium remains the industry standard.
- Europe's Ariane 6 experimented with a system that converted liquid oxygen and hydrogen into gas for pressurisation, but the system failed during its debut launch, reaffirming helium's critical role.

Conclusion:

- Helium's unique properties make it indispensable in space missions for pressurisation, cooling, and leak detection, despite challenges such as leaks.
- Its frequent use in space systems highlights the ongoing need for improved design and safety measures.



Daily Quiz

Q1. Which of the following measures has NOT been highlighted as crucial for reducing malnutrition-related deaths in children?

- Improving sanitation and clean water access.
- Providing widespread vaccinations.
- Increasing the number of children with low birth weight.
- Supporting mothers during pregnancy and postnatal care.

Q2. What is the significance of the trilateral framework involving India, the UAE, and France with respect to nuclear energy cooperation?

- It solely focuses on military nuclear collaboration.
- It aims to promote cooperation in nuclear energy and other energy sectors like solar power.
- It involves the development of nuclear weapons technology.
- It exclusively deals with fossil fuel energy cooperation.

Q3. Consider the following statements regarding the GST Council's review of taxes on health and life insurance premiums:

- The GST Council is considering reviewing the 18% GST on health and life insurance premiums and may recommend a reduction or removal.
- A new Group of Ministers (GoM) has been tasked with submitting recommendations on this issue within 50 days, ahead of the GST Council's next meeting.
- The GoM is also tasked with reviewing GST Compensation Cess, which was extended till March 2026.

Which of the above statements is/are correct?

- 1 and 2 only
- 1 and 3 only
- 1, 2, and 3
- 2 and 3 only

Q4. Consider the following pairs related to India's contract for Su-30MKI jet engines:

Contract Details	Description
1. Number of engines	240 AL-31FP engines to be manufactured by Hindustan Aeronautics Limited (HAL)
2. Indigenisation target	Gradual increase to 75% indigenisation by the end of the delivery programme
3. Assembly location	HAL's Koraput Division in Karnataka
4. Su-30MKI fleet size	IAF currently operates 259 Su-30MKIs of 272 originally contracted

How many of the above pairs are correctly matched?

- Only one
- Only two
- Only three
- All four

Q5. Consider the following statements regarding the launch of two anti-submarine warfare vessels by the Indian Navy:

Statement 1: The Indian Navy launched two anti-submarine warfare shallow watercraft vessels, named INS Malpe and INS Mulki, at Cochin Shipyard to enhance coastal defence.

Statement 2: The vessels launched are part of a series of eight vessels that will replace the in-service Abhay-class ASW corvettes and are designed for low-intensity maritime missions,



mine-laying, and search and rescue operations.

Which of the following is correct in respect of the above statements?

- Both statements are correct, and Statement 2 is the correct explanation of Statement 1.
- Both statements are correct, but Statement 2 is not the correct explanation of Statement 1.
- Statement 1 is correct, and Statement 2 is incorrect.
- Statement 2 is correct, and Statement 1 is incorrect.

Q6. Which of the following best describes the physical characteristics of the elongated tortoise (*Indotestudo elongata*)?

- A large tortoise with a dark brown shell and yellow legs.
- A medium-sized tortoise with a yellowish-brown or olive shell, featuring distinct black blotches.
- A small tortoise with a green shell and orange markings.
- A large tortoise with a reddish shell and white spots.

Q7. Consider the following pairs related to recent studies of the photoelectric effect:

Study Details	Description
1. Light Pulse Duration	Femtosecond and attosecond pulses used for studying electron movement
2. Year of Significant Delay Report	2022
3. Discovery Institutions	SLAC National Accelerator Laboratory and MIT
4. Phenomena Observed	Shape resonance and Auger-Meitner effect causing electron delay

How many of the above pairs are correctly matched?

- Only one
- Only two
- Only three
- All four

Q8. Consider the following statements regarding the Indian context for implementing a register-based census system:

Statement 1: India has several initiatives like Aadhaar, PAN, and voter ID databases that could potentially be integrated into a unified Census database to create a register-based system.

Statement 2: The current database integration efforts in India are straightforward and do not face significant challenges in merging different databases into a single census system.

Which of the following is correct in respect of the above statements?

- Both statements are correct, and Statement 2 is the correct explanation of Statement 1.
- Both statements are correct, but Statement 2 is not the correct explanation of Statement 1.
- Statement 1 is correct, and Statement 2 is incorrect.
- Statement 2 is correct, and Statement 1 is incorrect.

Q9. Consider the following pairs related to Mpx:

Mpx Details	Description
1. New Variant	Ib variant affects more women and children
2. Number of Mpx Clades	Two clades: I and II
3. Vaccine Manufacturer	Bavarian Nordic



- MVA	
4. Vaccine Manufacturer - LC16m8	KM Biologics (approved only in Japan)

How many of the above pairs are correctly matched?

- A. Only one
- B. Only two
- C. Only three
- D. All four

Q10. Consider the following statements regarding the role and challenges of helium in rocket technology:

1. Helium's role in cooling rocket components is largely due to its low density and inert nature, which prevent chemical reactions and reduce thermal conductivity.
2. The low boiling point of helium is essential for its use in cryogenic cooling systems, but this property also makes it prone to leaks through microscopic gaps and seals.

Which of the above statements is/are correct?

- A. 1 only
- B. 2 only
- C. Both 1 and 2
- D. Neither 1 nor 2



Solutions

1. Correct Answer is C

Explanation:

- Increasing the number of children with low birth weight is detrimental and does not contribute to reducing malnutrition-related deaths.
- Instead, improving sanitation, providing vaccinations, and supporting mothers are crucial measures for reducing these deaths.

2. Correct Answer is B

Explanation:

- The trilateral framework between India, the UAE, and France aims to enhance collaboration in peaceful energy sectors, including nuclear and solar energy, promoting cleaner and sustainable solutions.
- Launched at the UN General Assembly in September 2022, this partnership focuses on:
 - Strengthening India's role in nuclear energy cooperation.
 - Expanding the UAE's nuclear investments and capabilities.
 - Leveraging France's expertise to support safe nuclear development.

This cooperation reflects a broader trend of countries working together on energy security and clean technologies, reducing reliance on fossil fuels.

3. Correct Answer is A

Explanation:

- **Statement 1 is correct** as the GST Council is reviewing the 18% GST on health and life insurance premiums, with discussions on

whether to lower or remove the tax.

- **Statement 2 is also correct** as a new GoM has been formed to provide recommendations within 50 days.
- **Statement 3 is incorrect** since the review of the GST Compensation Cess will be handled by a different group, not the GoM dealing with insurance premiums.

4. Correct Answer is B

Explanation:

- **Pair 1: Correct.** The contract is indeed for 240 AL-31FP engines to power the Su-30MKI fleet, manufactured by HAL under a licensed agreement with Russia.
- **Pair 2: Incorrect.** The indigenisation target is to gradually increase to 63%, not 75%, by the end of the delivery programme.
- **Pair 3: Incorrect.** The engines will be assembled at HAL's Koraput Division in Odisha, which specialises in aerospace manufacturing.
- **Pair 4: Correct.** The IAF currently operates 259 Su-30MKIs out of 272 originally contracted, making this statement accurate.

5. Correct Answer is A

Explanation:

- Both statements provide accurate information about the launch of the two anti-submarine warfare vessels by the Indian Navy.
- Statement 2 correctly explains that the new vessels will replace the existing Abhay-class corvettes and are designed for coastal defence and other missions like



mine-laying and search and rescue, aligning with the purpose of the vessels mentioned in Statement 1.

6. Correct Answer is B

Explanation:

- The elongated tortoise is characterised by its medium size and its yellowish-brown or olive shell adorned with distinct black blotches at the centre of each scute.
- It also features a pink ring around the nostrils during the breeding season.

7. Correct Answer is B

Explanation:

- **Pair 1: Correct.** Femtosecond and attosecond pulses are used to study the photoelectric effect on an atomic scale.
- **Pair 2: Incorrect.** The significant delay in electron emission was reported in 2023, not 2022.
- **Pair 3: Incorrect.** The discovery was reported by researchers from SLAC National Accelerator Laboratory, but not MIT.
- **Pair 4: Correct.** The phenomena observed include shape resonance and the Auger-Meitner effect, which influence the emission delay.

8. Correct Answer is C

Explanation:

- **Statement 1 correctly** mentions the potential integration of Aadhaar, PAN, and voter ID databases into a unified Census system.
- **Statement 2 is incorrect** as the integration of these databases into a single census system is complex and faces significant challenges, as noted in the context.

9. Correct Answer is C

Explanation:

- **Pair 1: Correct.** The Ib variant affects more women and children.
- **Pair 2: Correct.** Mpox has two clades: I and II.
- **Pair 3: Correct.** The Modified Vaccinia Ankara (MVA) vaccine is produced by Bavarian Nordic.
- **Pair 4: Incorrect.** LC16m8 is produced by KM Biologics and is approved only in Japan, but it's not the only manufacturer mentioned in the context.

10. Correct Answer is B

Explanation:

- **Statement 1 is incorrect** because helium's role in cooling rocket components is not primarily due to its low density but rather its low boiling point, which allows it to remain gaseous at extremely low temperatures.
- **Statement 2 is correct** as helium's low boiling point is crucial for cryogenic cooling, but it also makes helium prone to escaping through small gaps and seals, leading to challenges in containment.





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