NEXT IAS

DAILY CURRENT AFFAIRS (DCA)

Time: 45 Min

Date: 22-01-2025

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WORLD BANK ON INDUS WATER TREATY DISPUTE

Context

- Recently, the **Neutral Expert** appointed by the **World Bank** declared competent to decide on the differences between **India and Pakistan** regarding the hydroelectric projects **on the Indus and its tributaries**.

About the Indus Water Treaty (IVT)

- It was signed in 1960, governs the water-sharing arrangements between **India and Pakistan,** and was **brokered by the World Bank.**

- It allocates the **Eastern Rivers** *(Ravi, Beas, and Sutlej)* **to India,** and the **Western Rivers** *(Indus, Jhelum, and Chenab)* **to Pakistan**.
  - However, **India** is permitted **limited use of western rivers** for *Non-Consumptive Use; Domestic Use; Agricultural Use, and Generation of hydro-electric power.*

Key Features of IWT

- **Allocation of Water Resources:** The treaty allocates about 80% of the water from the Indus system to Pakistan, highlighting its dependence on these rivers.
- **Permanent Indus Commission (PIC):** Commissioners from both countries, to manage the treaty's implementation and resolve disputes.
- **Dispute Resolution:** Detailed mechanism for resolving disagreements, involving bilateral negotiations, World Bank-facilitated mediation, and, if necessary, arbitration. For resolving disputes, the IWT outlines distinct mechanisms:
  - **'Questions'** are addressed by the **Permanent Indus Commission (PIC)**;
  - **'Differences'** are addressed by a **Neutral Expert,** and;
  - **'Disputes'** are addressed by a **Court of Arbitration.**
- The World Bank's role includes appointing individuals to these positions upon request from either country.

Key Disputes

- Pakistan has objected to **several Indian hydroelectric projects,** including the **Kishanganga and Ratle plants etc**, citing potential violations of the treaty's provisions.
  - **Kishenganga river (Neelum)** is a tributary of the **Jhelum River.**
  - **Ratle hydroelectric project is on** Chenab River.
- Both India and Pakistan differed on whether the technical details of the hydel projects conformed with the treaty, given that the **Jhelum and Chenab were part of the 'western tributaries'**.

Implications

- India has welcomed the **Neutral Expert**'s decision as a significant step towards resolving the ongoing disputes by emphasizing **all questions referred to the Neutral Expert** fall within his competence under the treaty.
- It prevents the matters from being taken up by the **Court of Arbitration (CoA),** which Pakistan had sought.

Indus River and Its Tributaries

- **Origin of Indus River:** Bokhar Chu in the Tibetan region in the Kailash Mountain range near the Mansarovar Lake.
  - In Tibet, it is known as **'Singi Khamban' or the Lion's Mouth.**
  - It flows northwest and **enters the Ladakh region of India** at a place called **Demchok.**

Tributaries of Indus River

- **Left Bank Tributaries:** Zaskar River, Suru River, Soan River, Jhelum River, Chenab River, Ravi River, Beas River, Satluj River, and Panjnad River.
- **Right Bank Tributaries:** Shyok River, Gilgit River, Hunza River, Swat River, Kunnar River, Kurram River, Gomal River, Tochi River, and Kabul River.

Other Key Hydroelectric Projects on Western Rivers

- **On Indus:** Nimmo-Bazgo (Leh); Stakna (Leh)
- **On Chenab:** Baglihar Stage- I (Doda); Chenani on River Tawi (Udhampur, Tributary of Chenab); Dulhasti (Doda);
- **On Jhelum:** Uri-I & II (Baramula); Ganderbal (Sri Nagar); Upper Sindh I &-II (Sindh Nallah tributary of Jhelum);

Source: TH

STATUS OF THE SMART CITIES MISSION

In Context

- India's Smart Cities Mission has the potential to transform urban centers into hubs of innovation, economic power, and sustainability.

Key Features

- **Objective:** Enhance urban living by providing core infrastructure, a clean environment, and a decent quality of life.
  - Drive economic growth and improve the quality of life through social, economic, physical, and institutional development.
- **Operational Framework:**
  - **Selection Process:** 100 cities were selected through a two-stage competition.
  - **Implementation:** Special Purpose Vehicles (SPVs) handle project execution.
- **Centrally Sponsored Scheme:** ₹48,000 crore allocated by the central government over five years (₹100 crore per city annually).
  - States or Urban Local Bodies (ULBs) must match funding.
  - Additional resources raised via municipal bonds, government programs, and public-private partnerships (PPP).
- **Timeline:** Mission extended to March 31, 2025, for completion.

Achievements

- Over 8,000 projects launched, with an investment of ₹1.6 lakh crore.
- As of July 2024:
  - 90% of projects completed (7,188 projects).
  - 75% of projects completed in 75 cities.
  - 17 cities achieved 100% project completion.

Need for Smart Cities

- **Urban Growth:** 31% of India's population lives in urban areas, contributing 63% of GDP (Census 2011).
  - By 2030, urban areas are expected to house 40% of the population and contribute 75% of GDP.
- **Comprehensive Development:** Sustainable growth requires infrastructure development in physical, institutional, social, and economic sectors.

Challenges

- **Implementation Hurdles:** 10% of projects are delayed due to legal issues, clearances, and resource challenges.
- **Technological Barriers:** Reliance on advanced technologies like IoT faces challenges in areas lacking basic infrastructure.
- **Funding and Engagement:** Difficulty in securing funds, involving the private sector, and ensuring citizen participation.
- **Integration Issues:** Achieving seamless integration of systems remains a complex task.

Conclusion and Way Forward

- The Smart Cities Mission holds transformative potential to propel India toward becoming a $10 trillion economy. Its success depends on overcoming challenges through:
  - Innovative funding mechanisms.
  - Enhanced private sector collaboration.
  - Citizen-centric policies.
  - Efficient use of technology and infrastructure.
- Ultimately, the success of smart cities will be measured not only by the number of completed projects but by the lives transformed and the opportunities created. Bold action and visionary thinking will be critical for shaping India's urban future.

UCC RULES IN UTTARAKHAND

Context

- The Cabinet of Uttarakhand approved the rules for the Uniform Civil Code.

Background

- **In 2024**, The Uttarakhand Legislative Assembly passed **The Uniform Civil Code of Uttarakhand Act, 2024,** becoming the **first Indian State** to adopt a UCC post-independence.
- It bans polygamy, nikah halala, child marriage, and extrajudicial divorce practices while ensuring uniform marriageable ages (21 for men, 18 for women).
    - **Women gain equal property rights**, though personal laws on guardianship and Hindu Undivided Families remain unchanged.
    - **Live-in relationships are recognized as quasi-marriages**, safeguarding offspring legitimacy.

What is Uniform Civil Code (UCC)?

- **A Uniform Civil Code refers** to the provision of one law for the entire country, applicable to all religious communities, in their personal matters such as marriage, divorce, inheritance, adoption, etc.
- **Aim:** To replace the existing diverse personal laws that vary based on religious affiliations.

Constitutional Provisions

- **Article 44** contained in **part IV** of the Constitution says that the state "shall endeavor to secure for the citizens a uniform civil code throughout the territory of India".
- **Part IV of the Constitution** outlines the **Directive Principles of State Policy,** which, while not enforceable or justiciable in a court of law, are fundamental to the country's governance.

UCC in India

- **UCC in Goa:** It follows the **Portuguese Civil Code of 1867,** which means that people of all religions in Goa are subject to the same laws on marriage, divorce, and succession.
    - **The Goa Daman and Diu Administration Act of 1962**, which was passed after Goa joined the union as a territory in **1961**, gave Goa permission to apply the Civil Code.

Arguments in favor of UCC

- **Uniformity in Governance:** Having a common set of laws would streamline governance and administrative processes, making it easier for the state to administer justice and ensure the rights of its citizens.
- **Women's Rights:** Personal laws in different religions may have discriminatory provisions, particularly against women, and a uniform code will provide a more egalitarian legal framework.
- **Secularism:** A Uniform Civil Code is seen as a way to reinforce the secular fabric of the country by treating all citizens equally irrespective of their religious affiliations.
- **The Supreme Court** in various judgments including **Mohd. Ahmed Khan vs Shah Bano Begum judgment of 1985,** has called for the implementation of the Uniform Civil Code.
- **Promote national Spirit:** The implementation of a UCC will promote the integration of India by establishing a shared platform for diverse communities.

Arguments against UCC

- **Plurality in existing laws:** Experts argue that if there is plurality in already codified civil and criminal laws, how can the concept of '**one nation, one law'** be applied to diverse personal laws of various communities.
- **Issues with implementation:** The implementation of the code has been difficult because India is a diverse country with various religious communities following their own personal laws.
    - It has been argued that the marriage and death rituals observed by **tribal communities** differ from Hindu customs, and there is concern that these practices may also face prohibition.
- **Challenge for Law and Order:** It would be a tyranny to the minority and when implemented could bring a lot of unrest in the country.
- **Against Constitutional provisions:** UCC is perceived as an infringement upon the constitutional right to freely exercise one's chosen religion found in **Article 25 and 26** and the **Sixth Schedule** of the Constitution
- **The Law Commission of India** stated that a UCC "is neither necessary nor desirable at this stage".
    - It recommended that discriminatory practices, prejudices and stereotypes within a particular

religion and its personal laws should be studied and amended.

Way Ahead

- The authorities should consult with different sections of society before implementing the UCC to foster an environment of inclusivity, transparency, and respect for diverse perspectives throughout the process.
- The Law Commission expressed its support for achieving "equality within communities" as opposed to pursuing "equality between" communities.

Source: IE

ACCESSIBILITY OF ANTIVENOMS IN INDIA

Context

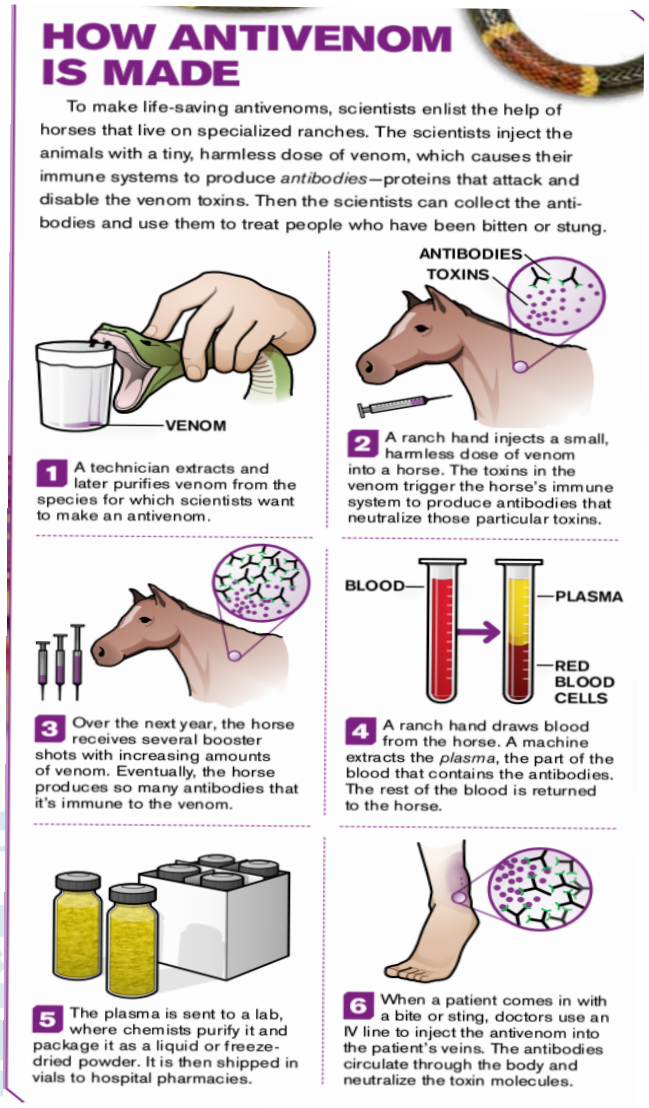
- Despite being the largest producer and consumer of antivenoms, India accounts for almost 50% of global snakebite deaths.

Snakebite Envenoming

- The snakebite envenoming (poisoning from snake bites) was classified by the **World Health Organisation (WHO)** as a high-priority neglected tropical disease.
- An estimated **1.8 – 2.7 million** people worldwide are envenomed annually.
- **Snake Bites in India:** In India, around **90% of snake bites** are caused by the **'big four'** among the crawlers - **common krait, Indian cobra, Russell's viper and saw scaled viper.**
- In India, around **58,000 deaths** occur of an estimated 3-4 million snake bites annually.

Strategy for developing anti-venom

- **Antivenoms:** Antivenoms are purified antibodies designed to neutralize venoms or specific venom components. They are produced using antibodies generated by animals that have been injected with controlled doses of venom.
  - They are included in the **WHO Essential Medicines List.**
- **Antivenoms making process:** To make life-saving antivenoms, scientists enlist the help of **horses** that live on specialized ranches.
  - The animals are injected with a tiny, harmless dose of venom, which causes their immune systems to produce antibody proteins that attack and disable the venom toxins.



  - Then the antibodies are collected and used to treat people who have been bitten or stung.

Challenges in Accessing Antivenoms

- **Geographical Barriers:** Remote areas lack nearby healthcare facilities with antivenom supplies.
- **Limited Venom Coverage:** Indian antivenoms primarily target the "**big four"** snakes **(cobra, krait, Russell's viper, and saw-scaled viper).**
  - Other venomous species, such as the king cobra and pit vipers, remain uncovered, leading to ineffective treatment and poor outcomes for victims.
- **Cultural and Social Factors:** Superstitions and cultural practices in rural areas delay timely medical intervention.
- **Economic Constraints:** High production costs limit accessibility for economically disadvantaged populations.

- **Infrastructure and Logistical Issues:** Cold storage requirements are unmet in rural areas due to insufficient power and infrastructure.
  - Improper storage degrades antivenom, reducing its effectiveness.

Way Ahead

- The **National Action Plan for Prevention and Control of Snakebite Envenoming (NAP-SE)** aims to prevent and manage snakebite envenoming, with the goal of reducing deaths and cases of disability by half by 2030.
- **Innovative Antivenom Development:** Researchers are using recombinant DNA technology to develop synthetic antivenoms that are free from animal-derived proteins, ensuring greater safety and efficacy.
- **Diagnostic Advancements:** Portable venom-detection kits and rapid diagnostic tools are being introduced to guide the effective use of antivenoms, ensuring timely and appropriate treatment.

Role of the Irular Community

- The Irular people are **skilled snake-catchers** and can safely extract venom from snakes in controlled environments.
- Their expertise ensures a steady supply of high-quality venom for antivenom production in India.

Source: TH

NEED POLICY FOR AFFORDABLE BIOETHANOL

Context

- According to the Honda Motor Co Ltd, India has the **advantage of achieving carbon neutrality** but the government needs to make prices of bioethanol fuel more affordable.

Major Suggestions

- The government should create a mechanism to make fuel pricing more affordable and maintain economic viability for users through its policies.
- Vehicle manufacturers should continue to take initiatives to improve fuel efficiency.
- For the ethanol fuel to remain economically viable the fuel cost per km must be kept the same or lower compared to gasoline vehicles.
  - To achieve this, initiatives including reducing tax on ethanol should be considered.

Ethanol

- It can be produced from **sugarcane, maize, wheat, etc** which are having high starch content.
- In India, ethanol is mainly produced from **sugarcane molasses by fermentation process**.
- It can be **mixed with gasoline** to form different blends.
- **Application:** It is widely used not only as an alternative fuel source but also in various industries as a chemical solvent and in the synthesis of organic compounds.
  - Ethanol also has medical applications as an antiseptic and disinfectant, adding to its versatile uses.

Ethanol Blending

- Ethanol blending refers to the **practice of mixing ethanol with gasoline** to create a fuel mixture that can be used in internal combustion engines.
- **There are a few common blends:**
  - **E10:** This is a mixture of 10% ethanol and 90% gasoline. It is the most common blend and is used widely in many countries.
  - **E15:** This blend contains 15% ethanol and 85% gasoline.
  - **E85:** This is a high-ethanol blend, consisting of 85% ethanol and 15% gasoline. It's used in flex-fuel vehicles designed to run on higher ethanol content.

Need

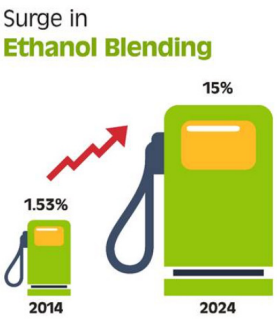
- As of March 2024, around **98% of the fuel** used in the road transportation sector comes from fossil fuels, while only **2% is met by biofuels like ethanol.**
- This **dependency on fossil fuels** presents challenges related to energy security, foreign currency outflow, and environmental impact.
- With ethanol blending, India has a **promising opportunity to reduce** its dependence on imported oil **while addressing environmental concerns.**

India's Ethanol Blending Program

- The Ethanol Blended Petrol (EBP) programme was launched in **2003**.
  - The programme sought to promote the use of alternative and environment friendly fuels and to reduce import dependency for energy requirements.

- **Objectives**
  - **Reduce Import Dependence:** India aims to decrease its reliance on imported crude oil, thereby improving energy security.
  - **Environmental Benefits:** Ethanol is a cleaner-burning fuel compared to gasoline, which helps in reducing air pollution and greenhouse gas emissions.
  - **Support for Farmers:** The program supports the agricultural sector by providing a market for ethanol, which is often derived from sugarcane, corn, or other crops.
- **Key Components**
  - **Blending Targets:** India has set specific targets for ethanol blending. For instance, the National Policy on Biofuels (2018) outlines a target of 20% ethanol blending in petrol by 2025-26.
  - **Phased Implementation:** The blending targets are being rolled out in phases, gradually moving towards higher blends like E20.
  - **Infrastructure Development:** The government has been investing in the infrastructure necessary for ethanol production, storage, and distribution, including establishing more ethanol production facilities and blending units.

Major Achievements of EBP



- After achieving **15% ethanol blending in 2024,** the government set an ambitious target of achieving **20% blending by 2025-26.**

Challenges

- **Infrastructure:** Developing the necessary infrastructure for large-scale ethanol production and blending can be complex and costly.
- **Feedstock Availability:** Ensuring a steady and adequate supply of raw materials for ethanol production, such as sugarcane, can be challenging, especially in the face of changing agricultural conditions and market fluctuations.
- **Consumer Acceptance:** Educating consumers and ensuring that vehicles can run efficiently on higher ethanol blends are also important for the program's success.

Conclusion

- India's Ethanol Blending Program is a significant step towards a more sustainable and self-reliant energy future, aligning with broader goals of environmental protection and energy independence.

Source: LM

US WITHDREW FROM THE PARIS AGREEMENT

Context

- US President Donald Trump decided to **withdraw the United States from the Paris Agreement again** — having first done so in 2017.

About

- On his first day in office, Trump also ordered an immediate revocation of all climate finance commitments made by the US.
  - He has promised to reverse some of the climate-friendly energy policies of the last few years, and reiterated his commitment to extracting more oil and gas to meet America's energy requirements.
- **Background:**
  - Trump's predecessor (and successor) Joe Biden had taken the US back into the Paris Agreement in 2021.
  - The US had not become a party to the 1997 Kyoto Protocol as well, having refused to ratify it after signing on to it.
- **Reasons for the Trump's Policy:**
  - He opined that the international regulations on climate change have been unfair to the US because similar restrictions are not placed on China, on account of it being classified as a developing country.

Paris Agreement

- It is a **legally binding international treaty** on climate change, adopted in **2015**, at the **COP21** to the United Nations Framework Convention on Climate Change (UNFCCC).
- It aims to **limit global warming to below 2 degrees Celsius** above pre-industrial levels, with efforts to limit the increase to 1.5 degrees Celsius.

- The Paris Agreement emphasizes **nationally determined contributions (NDCs)** and encourages all countries to take climate action.
  - Countries must **review and update their NDCs every five years** to enhance their efforts and increase ambition over time.
- **Article 28 of the Paris Agreement** lays out the procedure and timeline for a country's withdrawal from the treaty.
  - Any time after three years from the date on which this Agreement has entered into force for a Party, that Party may withdraw from this Agreement by giving written notification.

Implications

- **Emission Targets:** US has set the target to reduce its emissions by 50-52% by 2030 (from 2005 levels) and by 62-66% by 2035.
  - As of now, the US is not on track to meet its 2030 emissions goal — and four years of Trump will make it almost certain that these are not achieved.
- **Second Largest Emittor:** The US is the world's second-largest emitter of greenhouse gases. The objective of the Paris Agreement cannot be achieved without its full participation in the common effort to reduce emissions.
- **Increase in Fossil fuel Production:** Trump has been explicit about drilling new oil wells and gas fields this time, as a result fossil fuel production could rise in the next four years.
- **Funding of Climate Finance:** It will further squeeze in funds available for climate action for the developing countries.
  - The US has the greatest influence on mobilising private and international finance, Trump's policies could see this source drying up as well.
- **Impact on other countries:** Experts fear other countries, especially China, could use it as an excuse to ease off their own efforts to curb carbon emissions.

Conclusion

- **Global Warming:** The world is now long-term 2.3 degrees Fahrenheit (1.3 degrees Celsius) above mid-1800s temperatures.
  - Global temperatures last year passed the warming mark of 2.7 degrees Fahrenheit, and it was the warmest year on record.
- **US Share in Global Warming:** According to the Global Carbon Project, the U.S. is responsible for nearly 22% of the carbon dioxide put in the atmosphere since 1950.
  - The US has the largest share of historical emissions, and therefore also the greatest responsibility to clean up.
- The wildfires in Los Angeles are the latest reminder that Americans, like everyone else, are affected by worsening climate change.
- America could stay focused on growing the clean energy industry and technologies for driving down energy costs.

Source: IE

NEWS IN SHORT

PARAKRAM DIWAS

Context

- Parakram Diwas is observed annually on 23rd January to commemorate the birth anniversary of **Netaji Subhash Chandra Bose.**

About

- The first Parakram Diwas was held at **Victoria Memorial in Kolkata.**
  - The year 2022 saw the unveiling of a hologram statue of Netaji at India Gate, New Delhi;
  - and in 2023, 21 unnamed islands in the Andaman and Nicobar archipelago were named after the 21 Param Vir Chakra Awardees.

About Netaji Subhash Chandra Bose

- He was a prominent Indian nationalist and leader who played a crucial role in the Indian independence movement.
- He was the **first person** to call Mahatma Gandhi **"Father of the Nation"**, in his address from Singapore.
- **Indian National Congress:**
  - He was elected as the President of the Indian National Congress twice, in **1938 and 1939.**
  - Ideological differences with Mahatma Gandhi led to his resignation and the formation of the **Forward Bloc,** a political faction committed to radical change.
- **Azad Hind Radio 1942:** He established **Azad Hind Radio in Germany** to reach out to Indians and spread his vision of independence.

- **He coined several patriotic slogans,** including "Jai Hind," "Dilli Chalo" (On to Delhi), and "Give me blood, and I will give you freedom".

- **Formation of Indian National Army (INA):** In 1942, he formed the INA with the help of Japanese forces.
  - The INA was an armed force aimed at securing India's independence through military action against British rule.
- **Azad Hind Government:** In **1943**, Subhash Chandra Bose renamed the Andaman and Nicobar Islands as "Shaheed" (Martyr) and "Swaraj" (Self-Rule) during his leadership of the Azad Hind Government.
  - This was a symbolic gesture of asserting India's sovereignty against British rule.
  - On October 21, 1943, Netaji declared the **establishment of the Provisional Government of Free India (Azad Hind Sarkar).**
- Subhash Chandra Bose reportedly passed away in a plane crash in Taiwan on August 18, 1945, from severe burn injuries.
- **Legacy:**
  - He is widely respected for his contributions to the nationalist movement, and his legacy continues to inspire people across India and beyond.

Source: PIB

PRIME MINISTER'S INTERNSHIP SCHEME

In News

- According to recent reports, many companies are supporting the Prime Minister's Internship Scheme, with many embracing internships through CSR.

About Prime Minister's Internship Scheme

- It has been announced in the **Budget 2024-25.** It aims to provide internship opportunities to one crore youth in **top 500 companies over five years.**
- Interns will gain exposure to real-life business environments and employment opportunities.
- **Features :** Partner Companies can offer internships starting from October 2024
  - Top 500 companies identified based on CSR expenditure.
  - Participation is voluntary, with approval from the Ministry of Corporate Affairs for other companies to join.
  - **Internship Duration is 12 months,** with at least half of the period in a real-world job environment.
- **Eligibility Criteria: Age:** Between 21 and 24 years.
  - **Educational Qualifications:** High School, ITI, diploma, or undergraduate degrees (BA, B.Sc, B.Com, BCA, BBA, B.Pharma).
  - **Ineligibility:** Graduates from IITs, IIMs, etc.
    - Candidates with master's or higher degrees.
    - Those enrolled in government-sponsored skill/training programs.
    - Candidates with family income above Rs 8 lakh or government employee relatives.
- **Benefits:** Interns gain practical experience, with certificates provided by Partner Companies.
  - Financial Assistance is Rs. 5,000 per month (Rs. 4,500 by government, Rs. 500 by company). One-time Rs. 6,000 for incidentals.
  - Insurance Coverage under Pradhan Mantri Jeevan Jyoti Bima Yojana and Pradhan Mantri Suraksha Bima Yojana. Companies may provide additional insurance.

Source :TH

DIAMOND IMPREST AUTHORIZATION (DIA) SCHEME

Context

- The Department of Commerce has introduced the **Diamond Imprest Authorization (DIA) Scheme.**

About

- **Aim:** To enhance the global competitiveness of India's diamond sector.
- **Key Features of the Scheme:**
  - **Duty-free imports:** Allows the **duty-free import** of Natural Cut and Polished Diamonds, of less than ¼ Carat (25 Cents).
  - **Export obligation:** It mandates **export obligation with a value addition of 10%.**
  - **Eligibility:** All Diamond exporters holding Two Star Export House status and above and having US $15 Million exports per year, are eligible for availing the benefit under this scheme.

- **Need:**
  - This move comes in response to policies in diamond-producing countries like Botswana and Namibia, where manufacturers must process diamonds locally.
  - This scheme is aimed towards retaining India's position as a global leader in the entire value chain of the Diamond industry.
- **Significance:**
  - The scheme is designed to provide a level playing field for Indian diamond exporters, particularly MSME exporters, enabling them to compete effectively with larger peers.
  - It is also expected to create employment opportunities for skilled craftsmen in the diamond industry and is also expected to increase the export of Cut and Polished Diamond from India.

Source: PIB

PINAKA ROCKET SYSTEMS

Context

- The Indian Army has set a Rs 10,200 crore order for ammunition related to the Pinaka multi-launch artillery rocket system.

About

- The Pinaka MBRL system was developed by the **Defence Research and Development Organisation (DRDO) of India.**
- The system is named after **"Pinaka,"** a **mythical weapon used by Lord Shiva**.
- It has the capability to hit targets at **75 kilometers and beyond.**
- The Pinaka MBRL is capable of launching a salvo of **12 rockets in 44 seconds**, which makes it an effective weapon for quickly overwhelming enemy defenses.
- **Armenia** became the first export customer for the indigenously developed Pinaka with interest expressed by several countries in the system.

Source: FE

SCRAMJET ENGINE FOR HYPERSONIC MISSILES

In News

- Defence Research & Development Laboratory (DRDL) in Hyderabad, under DRDO, is developing long-duration **Supersonic Combustion Ramjet (Scramjet)** powered **Hypersonic technology.**

About the Developments

- Three key air-breathing engine technologies are being developed globally.
- **Ramjet:** It uses forward motion to compress incoming air for combustion without a rotating compressor.
  - It operates efficiently at Mach 3 to Mach 6 but becomes less efficient at hypersonic speeds.
  - It requires rocket assistance for take-off to reach necessary speeds.
- **Scramjet:** It is an **advanced version** of the ramjet that operates efficiently at hypersonic speeds (above Mach 5).
  - **It is an air-breathing engine** that sustains combustion at supersonic speeds without moving parts.
  - It allows **supersonic combustion**, making it suitable for **hypersonic vehicles.**
    - In August 2016, ISRO successfully flight-tested its Scramjet Engine in Sriharikota.
    - Recently DRDL successfully demonstrated **India's first Active Cooled** Scramjet Combustor ground test for 120 seconds, a significant milestone for **hypersonic missile development.**
- **Dual Mode Ramjet (DMRJ):** It can operate both as a ramjet at subsonic speeds and as a scramjet at supersonic speeds, typically within the Mach 4-8 range.

Do you know ?

- Hypersonic missiles are a class of **advanced weaponry** that travel at speeds greater than **Mach 5** i.e., **five times the speed of sound** or more than **5,400 km/hr.**
  - These advanced weapons have the potential to bypass existing Air Defence Systems and deliver rapid and high-impact strikes.
- Several nations including th**e USA, Russia, India and China are actively pursuing Hypersonic technology.**

Source :TH

JAWAHARLAL NEHRU PORT

In News

- Union Minister of Ports, Shipping & Waterways launched **multiple projects** worth nearly 2,000 crore in order to expand capacity at the **Jawaharlal Nehru Port.**

- He also launched one Solar powered boat, two indigenously developed tugs and three fire tenders, boosting the safety and efficiency of the port.

Jawaharlal Nehru Port

- It is situated in Mumbai, Maharashtra and is one of the premier **container-handling ports in India.**
- It was commissioned in **1989** and it is the **country's first 100% Landlord Major Port.**
- It is **India's Best-performing port**, accounting for around **50% of the total containerised cargo volume** across the major ports of the country.
- It is ranked **26th among the top 100 container ports** in the world and it is connected to over 200 ports globally.
- In 2024, JNPA achieved a record of 7.05 million TEUs, operating at over 90% capacity with an 11% year-on-year growth.
- It aims to become **India's first port to handle 10 million TEUs((twenty-foot equivalent units) by 2027.**

Source :TH

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