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GS 2 : Polity, Governance, International Relations

1. Constitution (105th Amendment) Act 2021

The President of India gave assent to the **Constitution (105th Amendment) Act, 2021**.

- It **restores** the power of State Governments to identify and specify Socially and Economically Backward Classes (SEBCs).
- As per the Act, every State or Union territory may **prepare and maintain** a list of socially and educationally backward classes, for its own purposes.
 - The entries in these state lists may be different from the **Central List**.

Lok Sabha has passed the **Constitution 127th Amendment Bill, 2021** with unanimous support from the House.

Need of the 127th Constitution Amendment Bill:

- The **127th Amendment Bill, 2021** seeks to restore the power of state governments to **identify other backward classes** that are socially and economically backward.
- The power of the states was taken away by the **Supreme Court** interpretation in May 2021.

Background:

- According to the Constitution of India, **Articles 15(4), 15(5) and 16(4)** confer power on a **state to identify and declare** the list of socially and educationally backward classes.
- As a matter of practice, **separate OBC lists** are drawn up by the Centre and each state concerned.

Supreme Court order in May 2021:

- The Supreme Court order in May 2021 had empowered **only the Central government for such identification**.

- The SC in its order on **Maratha reservations upheld the 102nd Constitutional Amendment Act** that inserted Articles 338B and 342 A (with two clauses) after Article 342.
- It said that the **President of India**, in consultation with governors would specify socially and economically backward classes, **taking away the powers of state governments** to do so.
 - **Articles 338B** deals with the structure, duties and powers of the National Commission for Backward Classes.
 - **Article 342A** says that the president, in consultation with the governor, would specify the socially and educationally backward classes.
- The amendment will **restore the powers of the state governments to maintain a state list of OBCs**.

Why did the SC intervene?

- The Supreme Court order in the **Indira Sawhney case in 1992** had ruled that reservation in any state **should not exceed the 50 percent mark**.
- Many states like Tamil Nadu, Haryana and Chhattisgarh – have introduced quotas that **breach the total 50 percent ceiling** while other states have asked the Supreme Court to **hike the quota ceiling**.
- The **exceeding of ceiling limit** without there being any exceptional circumstances **clearly violates Article 14 and 16** of the Constitution.

127th Constitution Amendment Bill:

- The 127th Constitution Amendment Bill will amend clauses 1 and 2 of **Article 342A** and also introduce a **new clause 3**.
 - The bill will also amend Articles 366 (26c) and 338B (9).
 - Article 366 (26c) defines socially and educationally backward classes.
- The bill is designed to clarify that the **states can maintain the "state list" of OBCs**, in accordance with the system prior to the Supreme Court judgment.
- The **"state list"** will be **completely taken out of the ambit of the President** and will be notified by the state Assembly as per the proposed Bill.

GS 3 : Economy, Science and Technology, Environment

2. Rainfall at Greenland ice summit for first time

Context:

- **Heavy rainfall has been recorded across Greenland** and there has been the first ever recording of rainfall at the highest point on the Greenland ice sheet.
 - Greenland has recorded the largest amount of rainfall since records began in 1950. Rainfall was recorded for several hours at the ice sheet's 3,216-metre summit.

Details:

- The unprecedented rains can be attributed to **change in air circulation patterns, indicating the presence of warm and moist air over Greenland.**
- Also notably, **the temperature at the ice cap which typically remain above freezing temperature have fallen below the freezing temperature thrice in less than a decade**
- Experts have warned that the record rains at the summit of Greenland is not an isolated event and is part of a string of warning signs with respect to global warming and climate change. Along with rising floods, fires, and other extremes, the rains in greenland is one of many “alarm bells” signalling the need to reduce greenhouse gas emissions.

Concerns:

Impact of rainfall on ice sheet melting:

- Rainfall on an ice sheet is not a healthy sign for an ice sheet. **Water on ice makes the ice sheet more prone to surface melt** as the water is not only warmer than the usual snow but it is also darker – so it absorbs more sunlight.
- The rainfall would only increase the rate of ice sheet melting due to global warming.

Rise in sea levels:

- The melt water from ice sheets stream into the ocean, causing sea levels to rise.
 - Greenland's ice sheet is the world's second-largest icesheet after Antarctica's . The Greenland ice sheet is two miles thick and covers about 650,000 square miles.
- As per available estimates, **melting from Greenland's ice sheet has caused around 25% of global sea level rise seen over the last few decades.** This share is only expected to grow, as global temperatures increase further.
 - Scientists claim the Arctic is warming faster than any other region on Earth.

Impact of global climate:

- Increased rainfall and melting of the Greenland Ice sheet may be contributing to the observed **slowing down of the Gulf Stream Ocean current and its influence on the Atlantic Meridional Overturning Circulation (AMOC) system.**

3. U.S. lab makes headway in nuclear fusion energy

Context:

- Breakthrough in Nuclear fusion technology achieved at the U.S. National Ignition Facility (NIF).

Background:

Nuclear fusion technology:

- Nuclear fusion is a reaction in which **two light atomic nuclei are combined to form a heavier atomic nucleus and subatomic particles.** The difference in mass between the reactants and products is manifested as energy as explained by **Einstein's equation ($E=mc^2$)**, which says that mass and energy can be converted into each other.
- If scientists develop a way to harness energy from fusion in machines on Earth, it could be an important method of energy production.
- Nuclear fusion is a **clean and green route to producing energy.**
 - A fusion reactor is carbon neutral, it does not create carbon dioxide.
 - Nuclear fusion unlike Nuclear fission does not give out any remnant radioactive waste products
 - The fuel used for Nuclear fusion is easily available.

Deuterium-tritium (DT) fusion reaction:

- Fusion can involve many different elements in the periodic table. However, researchers working on fusion energy applications are especially interested in the **deuterium-tritium (DT) fusion reaction.**
 - **DT fusion reaction releases much more energy than most fusion reactions and they occur at lower temperatures than other elements.**
- Deuterium (D) and tritium (T) fusion reaction produces a helium nucleus (or alpha particle) and a high energy neutron. The neutrons from DT reactions are harvested to produce energy.

Challenges in harnessing nuclear fusion energy:

- Although nuclear fusion has the potential to offer almost unlimited clean energy, **harnessing it is extremely difficult**. Several steps remain before a viable nuclear fusion reactor can be realised.
 - **Plasma reaching temperatures of 150 million degrees Celsius needs to be produced for fusion to be initiated**. This temperature needs to be maintained to sustain the fusion reaction as well. This leads to **material constraints** given the fact that there are very limited materials which can sustain such high temperatures for sustained periods of operation. Also such high temperatures would also necessitate much higher **cooling system capability** as compared to that observed in Nuclear fission reactors.
 - Even though nuclear fusion gives rise to large energy output, considering the fact that a large energy input is necessary to maintain the conditions necessary for nuclear fusion, the **net energy output continues to remain low or even negative based on current technological developments**. This makes nuclear fusion technology unviable for energy generation based on current technological advancement.
 - To be functional and financially viable, a nuclear fusion reactor has to produce an output that is at least tens of times the input energy.
 - The technology to convert the neutron energy into electricity has to be developed. **Means have to be found to extract the neutron energy as heat and produce electricity**.

Details:

- An experiment at the U.S. National Ignition Facility (NIF) has for the first time in a controlled laboratory setting has **produced nearly as much energy as was supplied to initiate the reaction**.
- Also unlike previous attempts, the hotspot was able to **ignite a self-sustaining chain reaction**, fusing more hydrogen atoms together and continuing the process of energy generation.
- Experts have hailed the **breakthrough in maintaining the sustainability of this reaction and achieving the energy break-even** as a giant step toward the holy grail of Nuclear fusion energy research

Additional information:

Tokamak:

- A tokamak is a device which uses a **powerful magnetic field to confine plasma** in the shape of a torus. The tokamak is one of several types of magnetic confinement devices being developed to produce **controlled thermonuclear fusion power**.

Stellarator:

- A stellarator is a plasma device that **relies primarily on external magnets to confine a plasma**.

4. 'LeT, JeM may intensify infiltration bids'

Context:

- Subsequent to the **Taliban takeover of Afghanistan**, there have been concerns raised over the negative impact of this development on **India's internal security**.

Background:

Linkage between Taliban and anti-India terror outfits:

- Anti-India terror outfits such as the **Lashkar-e-Taiba (LeT)** and the **Jaish-e-Mohammed (JeM)** have extended active support to the Taliban over the years.
 - The JeM has been deploying senior commanders and trained cadres for Taliban operations. It has also been providing refuge to the cadre of the Taliban.
 - The LeT has also been a major source of armed men for the Taliban and the Haqqani Network against the U.S.-led forces in Afghanistan for the past several years.
- The JeM was founded by Masood Azhar in 2000, after his release from an Indian prison along with two others in exchange for passengers on board the hijacked Indian Airlines flight IC-814. The hijacked plane had been taken to the then Taliban-controlled Kandahar.
- LeT was founded in the Kunar province of Afghanistan in 1987 by Hafiz Saeed and others.

Continued presence of anti-India terror outfits in Afghanistan:

- LeT cadres continue to operate in the Kunar, Nangarhar and Nuristan provinces, while JeM fighters are active in the Ghazni, Kandahar and Helmand provinces of Afghanistan.

Haqqani network link:

- **The LeT and JeM leadership have been in contact with top Taliban functionaries through the Haqqani Network.** Following the Taliban takeover, the Haqqani network group is now controlling security for Kabul. This leads to the high possibility of LeT and the JeM operatives getting a base at Kabul and support from the Taliban.

Taliban and al-Qaeda link:

- As per a UNSC report in June, the Taliban and al-Qaeda continue to be closely aligned, with Al-Qaeda elements believed to be residing in at least 15 Afghan provinces.
- **Al-Qaeda in the Indian Subcontinent also operates under the Taliban umbrella** from Kandahar, Helmand and Nimruz provinces.

Prisoner release:

- Among the hundreds of prisoners released from Afghan prisons subsequent to the Taliban takeover, includes many from the LeT and the JeM outfits.

Security threat assessment for India:

- The latest threat assessment from Indian security agencies, warns of a situation wherein after things settle down a little in Afghanistan, **terrorist outfits like the LeT and the JeM may shift their focus to Jammu and Kashmir region** and intensify efforts to infiltrate into Indian territory.
- Attempts to infiltrate via the Jammu-Rajouri sector had already increased.

5. Power play

Context:

- **Draft Electricity (Amendment) Bill, 2021.**

Background:

Bad state of the Discoms:

- Electricity distribution has remained the sore point in the country's power network.
- The distribution companies (discoms) which by and large come under the control of the States, have been **plagued by a variety of issues**.
 - Thirty-six out of 56 discoms have reported aggregate **losses of around Rs. 32,900 crore** as on March 31, 2020. They owe over Rs. 90,000 crore to power producers at the end of June 2021.
 - Discoms continue to be saddled with **structural challenges in governance and regulation**.
 - The Regulatory Commissions in many states have not been able to function with the desired speed or efficiency.
 - They face the problems of **underinvestment, line losses and issues in billing, metering, and collection** which seems to be acting as a body blow to their financial viability.
 - Aggregate Technical & Commercial (AT&C) losses lies in the range of around 20%.
- The government has tried several times to make discoms financially viable through schemes like **UDAY**, but their efforts have not met with the desired success.

Major provisions of the amendment bill:

- The broad objectives of the legislation are to **ensure consumer-centricity, promote ease of doing business, enhance sustainability of the power sector and promote green power**.
- One of the main provisions includes the move to **de-license power distribution and allow for greater private sector participation in the electricity distribution sector**. This will let consumers choose a distribution company in their area. It also proposes a role for distribution sub-licensees with regulators' nod.
- There is the provision of a **universal service obligation fund**, which shall be managed by a government company. This fund shall be utilised to meet any deficits in cross-subsidy.
- The draft bill **proposes direct benefit transfer (DBT) of subsidies**, reduction of cross subsidies, and the establishment of the electricity contract enforcement authority.
- It provides that the Commissions shall determine **tariffs that are reflective of cost** so as to enable Discoms to recover their costs.
- There will also be a **penalty for not meeting renewable energy (RE) purchase obligations** that require power distribution companies to buy a fixed amount of RE and reduce their reliance on fossil fuels. The responsibility of fixing renewable power obligation (RPO) is shifted from state commissions to the central government.

- The other major changes that the Bill is expected to bring about include the appointment of a member with legal background in every **electricity regulatory commission**, and the strengthening of the Appellate Tribunal for Electricity.

Arguments in favour:

Increased competition and associated benefits:

- The de-licensing provision will help **end the monopoly of state-run distribution companies** and overcome their financial non viability. By incentivizing greater private participation in the distribution sector it will help **increase competition** and thus aid in unleashing of next-generation power sector reforms in India.
- It will have a **positive bearing on distribution efficiency and help reduce tariffs**. The anticipated technological upgrades including smart metering and infrastructure advancements that is expected through greater private participation will help reduce the huge AT&C losses.
- Increased competition will not only empower customers but also help **bring huge investments into the sector and accelerate technology adoption**.

Impact on Renewable energy sector:

- The reforms will especially **make the RE generation, transmission and distribution financially more attractive to investors**.
- The provision regarding renewable energy (RE) purchase obligations will **help India meet its RE and global climate commitments**.

Reduce subsidy foregone:

- The introduction of Direct Benefit Transfer (DBT) of power subsidies will **ensure greater transparency and accountability** and ensure that the subsidy reaches people who are entitled to it, as we have seen in the case of LPG.
- This will help cut down on subsidy to the electricity sector and help ensure a better cost-reflective tariff.

Robust regulatory regime:

- The strengthening of electricity regulatory commission and the Appellate Tribunal for Electricity will **ensure faster resolution of long-pending issues and reduce the legal hassles for all stakeholders**.

Arguments against:

- Opposition parties and several organisations have objected to certain features in the draft Electricity (Amendment) Bill, 2021.
 - The proposed de-licensing of distribution has been opposed by some state governments. They fear that a greater role for private distribution companies and franchisees would only lead to **“cherry-picking of remunerative areas”** by these companies, leaving it to the State discoms to serve social sector obligations and rural areas. This would only push the State discoms to incur more massive losses.
 - Some states have opposed the proposed amendment on the grounds that it goes **against the federal structure of the Constitution as electricity is in the concurrent list**.
 - Those opposing the Bill contend that it will lead to more private players in the power sector, making electricity unaffordable for vulnerable sections. A greater stake for private sector could lead to a scenario where the new private service providers could **undertake unreasonable tariff hikes for profiteering**.
 - There is also the fear that the proposed DBT will **do away with the heavily subsidised or free power supply to the farm sector**.
 - Other specific complaints from the state includes the one from the state of Tamil Nadu, which argues that hydro-power purchase obligation cannot be fixed separately as hydro-power generation is seasonal, monsoon-dependent and not in the control of its discom.

Conclusion:

- The proposed amendment can be a game-changer for the power sector provided its lacunae are covered for and it is implemented as envisaged.

6. Green mermaid

- A new species of marine green algae has been discovered from Andaman and Nicobar Islands.
 - Algal diversity is one of the highest in the Andaman & Nicobar Islands.
- It has been named **Acetabularia jalakanyakae**.
- The species is the first of the genus Acetabularia to be discovered in India.
 - What is unique about the species is that the **whole plant is made up of just one gigantic cell with only one nucleus**.
 - Another feature of Acetabularia is their regenerative potential.

Significance of algae:

- **Oxygen producers:** Marine algae produce almost two-third of oxygen in the air.
- **Food producers:** Single-celled marine species are key to all the life forms on Earth. Algae convert atmospheric carbon dioxide into food for the marine ecosystem. They are at the base of the food chain. Also, when the algae die, they are consumed by organisms called decomposers (mostly fungi and bacteria).
- **Petroleum fossils:** Algae are also responsible for petroleum. When they die, they sink to the ocean floor. Over the years, this layer turns into what we know as petroleum.
- **Industrial and medical usage:** Marine algae have been used as food and medicine for many centuries. They are not only used as food but also used as extracts in food, dairy, cosmetics, and industrial uses. Algae is used as one of important medical source due to **its antioxidant, anticancer, antiviral properties.** .

Threat to algae:

- **Climate change and global warming**- Rise in water temperature decreases oxygen levels in the water
- **Ocean acidification**

Significance of the new discovery:

- **Research & studies:** The newly discovered species has a giant cell. Having such a giant cell is advantageous for molecular biologists who study cellular processes; as they can see it and manipulate it with the naked eye. For this reason, Acetabularia is considered a model organism.

THE INDIAN EXPRESS

GS 2 : Polity, Governance, International Relations

1. 'ZyCov-D' vaccine

In news: The Drug Controller General has granted emergency approval to the Zycov-D, a COVID-19 vaccine.

- This is the fifth vaccine, after Covishield, Covaxin, Sputnik V and Moderna to be approved for use in India.

About Zycov-D

- Zycov-D is a COVID-19 vaccine developed by the Ahmedabad based Zydus Cadilla group and is the first vaccine in India that can be administered to adults as well as those 12 and above.
- It's also the only DNA-based vaccine in the world and can be administered without a needle, purportedly minimizing chances of reactions.
- The vaccine has been developed in partnership with the Department of Biotechnology under the 'Mission COVID Suraksha'.
- The three-dose vaccine once administered produces the spike protein of the SARS-CoV-2 virus and elicits an immune response.
- The plug-and-play technology on which the plasmid DNA platform is based can be easily adapted to deal with mutations in the virus, such as those already occurring.

2. China Formally passes Three-Child Policy into law

In news China's legislature has formally amended the country's family planning rules to **allow couples to have three children**.

It also announced a number of policy measures aimed at boosting declining birth rates.

- The amended law calls on the authorities to take supportive measures, including those in finances, taxes, insurance, education, housing and employment, to reduce families' burdens as well as the cost of raising and educating children.
- China's regulators in recent weeks have taken **drastic measures to reduce education costs** – cited in many surveys as a main reason why many couples prefer to have only one child – including by improving the booming private education industry, which may be ordered to go non-profit according to reports.
- The changes come in the wake of China's once-in-ten year population census that recorded rapidly declining birth rates over the past decade.
 - According to The National Bureau of Statistics 12 million babies were born last year, the lowest number since 1961.
 - In 2016 also a "two-child policy" was introduced that largely failed to boost birth rates.

- Ageing crisis “might be the biggest challenge the Chinese nation faces in the next century.”

3. The fall of Kabul, the future of regional geopolitics

In news: The fall of Kabul in the wake of the American withdrawal from Afghanistan will prove to be a defining moment for the region and the future shape of its geopolitics.

Regional Geopolitics after the fall of Kabul

1. Power Vacuum leading to rise of anti-America axis

- An axis of regional powers such as China, Pakistan, Russia, and the Taliban have started filling the power vacuum, created by the haphazard manner of US withdrawal.
- Iran might also jump on this opportunistic bandwagon under the Chinese leadership.
- This axis of powers has anti-US feeling in various degrees which might further shrink American influence in Eurasian Heartland. India’s interest may be impacted as it has moved closer to US than ever before.
- As a result, US may explore new ways of working with them to stabilise region that might result in softening of US rhetoric on China.

Impact on India: While a healthy conversation among the great powers – the U.S., China and Russia – on global and regional challenges is a good sign, India is neither a great power nor present at the table.

2. China milking the opportunity to its advantage

- The post-American power vacuum in the region will be used by Beijing to further strengthen its efforts to bring every country in the region, except India, on the **Chinese Belt and Road Initiative** thereby altering the geopolitical and geo-economic foundations of the region
- Beijing is likely to become **less accommodative** towards India including on the Line of Actual Control.
- Even in trade, given the sorry state of the post-COVID-19 Indian economy, India needs trade with China more than the other way round.

- Unless India can find ways of ensuring a rapprochement with China, it must expect China to challenge India on occasion, and be prepared for it.
3. **Extremism will be the real problem for India**
- The real worry is the inspiration that disgruntled elements in the region will draw from the Taliban's victory against the world's sole superpower.
 - It is unlikely that the Taliban will proactively export terror to other countries unless of course for tactical purposes by, say for instance, Pakistan against India.
 - While other neighbouring countries are worried about terrorism emanating from Afghanistan, the reality is that they are busy making their own private deals with the Taliban to not host terror organisations targeting them
 - The bigger challenge for India, therefore, would be a near-certain increase in terrorism and extremism in the region.
4. **Impact on regional interests**
- The return of the Taliban to Kabul has effectively laid India's 'mission Central Asia' to rest.
 - If India could not find its way to Central Asia with encouraging partners such as Iran and the Hamid Karzai/Ashraf Ghani governments, the possibility of India doing so now will be very low.
 - Had India, cultivated deeper relations (does not mean recognition) with the Taliban, Indian interests would have been more secure in a post-American Afghanistan.

The fall of Kabul and the consequent knock-on effects in the region will have several potential **implications for India's foreign policy**

- For one, given the little physical access India has to its north-western landmass, its focus is bound to shift more to the Indo-Pacific
- Second, New Delhi might also seek to shed the arrogance it displayed towards its smaller neighbours during Modi 1.0 and cultivate friendly relations with them. Ex: Myanmar.
- Third, the developments in Afghanistan could nudge New Delhi to seek stability, if not peace, with Pakistan.

Conclusion

The lesson for India in the wake of these developments is clear: It will have to fight its own battles. So it must make enemies wisely, choose friends carefully, rekindle flickering friendships, and make peace while it can.

4. Section 170 of the CrPC

Section 170 of the CrPC

The Supreme Court has ruled that Section 170 of the Code of Criminal Procedure (CrPC) does **not impose an obligation on the Officer-in-charge to arrest** each and every accused at the time of filing of the chargesheet.

- The Court also examined the scope of Section 170 and various High Court judgments in this regard.

Section 170 of the CrPC:

- The word "custody" appearing in Section 170 of the Cr.P.C. **does not contemplate either police or judicial custody** but it merely connotes the **presentation of the accused by the Investigating Officer before the court** while filing the chargesheet.
- According to Section 170 of CrPC, the police officer should forward the report related to the case to the Magistrate all the documents or relevant extracts of the same and also the statements recorded under Section 161 of persons, on whom the prosecution rely as per Section 173(5).

GS 3 : Economy, Science and Technology, Environment

5. China's new data privacy laws and its impact

Context: China has recently passed a data protection law setting out tougher rules on how companies collect and handle their users' information.

- The **Personal Information Protection Law (PIPL)** lays out for the first time a comprehensive set of rules around data collection, processing and protection, that were previously governed by piecemeal legislation.
- The law will take effect on November 1, 2021. The full text of the final version hasn't yet been released.

Recent actions by Chinese on tech companies

- China's market regulator had also slapped fines on Internet-based platform company **Tencent** and asked its affiliated companies to relinquish exclusive rights to music labels.
- Beijing's cyber security agency had launched a probe into ride-hailing group Didi Chuxing days after it raised more than \$4 billion in a New York initial public offering in June 2021.
 - The Cyberspace Administration of China had asked Didi to stop accepting new user registrations saying that the app "has serious violations of laws and regulations pertaining to the collection of personal information".
 - Tens of thousands of consumers had complained about having to pay more for hailing a taxi using an iPhone than a cheaper mobile phone model or for tickets if they are profiled as a business traveller

What is China's new data protection law (PIPL) all about?

- Under the new rules passed by China's top legislative body, state and private entities handling personal information will be required to **reduce data collection** and **obtain user consent**.
- The Chinese state **security apparatus will maintain access** to swathes of personal data, however.
- The law also aims to protect those who feel strongly about personal data being used for user profiling or the use of big data in setting [unfair] prices.
- It will also prevent companies from setting different prices for the same service based on **clients' shopping history**.
 - China Consumers Association had stated that the consumers are being squeezed by data algorithms and becoming the targets of technical bullying.
- More so, the law stipulates that the **personal data of Chinese nationals cannot be transferred** to countries with lower standards of data security than China – rules which may present problems for foreign businesses.
 - Companies that fail to comply can face fines to the tune of up to 50 million yuan (around Rs 57 crore) or five per cent of their annual turnover.
- The law says sensitive personal data includes information which if leaked can lead to "discrimination... or seriously threaten the safety of individuals" including race, ethnicity, religion, biometric data or a person's whereabouts.

Impact of new law on the tech industry

- Experts believe that the policy is unlikely to limit the **state's widespread use of surveillance**. Beijing has long been accused of harnessing big tech to accelerate repression in the northwestern Xinjiang province and elsewhere.
- The new rules add to Beijing's **tightening of regulation**, particularly around data, which could impact the way China's technology giants operate.
- Tencent, the owner of the popular WeChat messaging app, has warned that **further regulations could be coming** for the technology industry.
- The greatest fallout of China notifying the law was that the **stocks of the big tech** companies of the country suffered a major slump, prompting renewed concerns among investors.
- The national privacy law closely resembles **Europe's General Data Protection Regulation**. However, unlike in Europe, where governments face more public pressure over data collection, Beijing is expected to **maintain broad access to data**.

6. Biju Swasthya Kalyan Yojana: Smart health card for Odisha's poor

In news Odisha Chief Minister launched the distribution of a smart health card.

- The scheme is known as Biju Swasthya Kalyan Yojana.
- The card will help poor families receive treatment up to Rs. 5 lakh per annum.
- About 3.5 crore poor people will benefit from the State-funded health debit card system.
- Under the Yojana, women members of the family can receive treatment up to Rs. 10 lakh in a year.
- People can also avail themselves of quality healthcare service in about 200 hospital chains in the country, including those in the State.

7. Dye-Sensitised Solar Cells using Kamala Fruit

In news Research team at Central University of Jharkhand has used the dye extract of the kamala fruit to create a low-cost and non-toxic sensitiser for dye-sensitised solar cells.

- But there is still a lot to be done to finalise the efficacy

What is Dye-sensitized solar cell?

- Dye-sensitized solar cell (DSSC) is a low-cost solar cell belonging to the group of thin film solar cells (converting solar energy into electricity)

- It is based on a semiconductor formed between a photo-sensitized anode and an electrolyte, a photoelectrochemical system.
- The modern version of a dye solar cell, also known as the Grätzel cell
- **Attractive features:** It is simple to make using conventional roll-printing techniques, is semi-flexible and semi-transparent which offers a variety of uses not applicable to glass-based systems, and most of the materials used are low-cost.

Key Takeaways

- Popularly known as senduri, rohini or rori among Jharkhand tribal communities, the red kamala tree is a semi-evergreen woody spurge plant that bears fruit only in spring.
- This is the first time this dye has been used for solar cell application.
- Natural dye was extracted from the pericarp of the kamala fruit.
- The extracted dye was used to make an inexpensive, non-toxic sensitizer for DSSCs or Grätzel cells, which **directly convert solar energy into electricity**.
- **Significance:** Natural dye can be easily extracted from an inedible source, like the kamala fruit in its untreated form, using a very low-cost technique and therefore it can provide the best alternative to that of toxic and expensive synthetic dye used for solar cells.
- For the past few years, natural extracts from produce such as jamun, pomegranate, spinach, beetroot, hibiscus, green algae and black carrot have been utilised as solar cell dye and found favour for both scalable and sustainable benefits.

8. New Development Bank

Commerce Minister called for the NDB to expand its horizons to fund service delivery in the education and health sectors besides funding infrastructure and industry development.

- The NDB should be expanded and resources be utilized for strengthening social infrastructure, especially for funding service delivery in education and health sector, besides promotion of infrastructure and industrial sector.

New Development Bank (NDB):

- The New Development Bank (NDB), formerly referred to as the **BRICS Development Bank**, is a multilateral development bank established by the **BRICS states (Brazil, Russia, India, China, and South Africa)**.

- The idea of setting up New Development Bank has been put at the **fourth BRICS Summit** in New Delhi (2012).
 - In the **sixth BRICS Summit in Fortaleza (2014)**, the Agreement was signed and NDB was established.
- The bank is headquartered in **Shanghai, China**.
- The first regional office of the NDB is in **Johannesburg, South Africa**.
- The second regional office was established in 2019 in **Sao Paulo, Brazil, followed by Moscow, Russia**.
- Brazil, Russia, India, China and South Africa considered establishment of NDB to **mobilize resources for infrastructure and sustainable development projects** in BRICS and other emerging economies, as well as in developing countries.
- The Bank shall support public or private projects through loans, guarantees, equity participation and other financial instruments.
- The initial subscribed capital of the bank was **equally distributed among the founding members**.
- The **voting power** of each member will be **equal to the number of its subscribed shares** in the capital stock of the bank. India also have the equal voting power (20%) among the five members of NDB.

Objectives:

- **Promote infrastructure** and sustainable development projects.
- **Establish an extensive network of global partnerships** with other multilateral development institutions and national development banks.
- Build a balanced project portfolio giving a proper respect to their **geographic location, financing requirements and other factors**.

Key facts:

- NDB is committed funding to several major infrastructure projects in India. Mumbai Metro rail and many renewable energy projects.
- **\$1-billion emergency assistance loan** was given to India for economic recovery post Covid-19.

9. Advance Chaff Technology

Advance Chaff Technology

The Defence Research and Development Organisation (DRDO) has developed an advanced chaff technology to safeguard Indian Air Force (IAF) fighter jets against hostile radar threats.

What is the advanced chaff technology?

- It is an **electronic countermeasure technology** used by militaries worldwide to protect their assets, like naval vessels and aircraft.
- It protects the assets from **radar and radio frequency**.
- **In case of naval ships**, chaff rockets are deployed in the air, which act as multiple targets for missile guidance system.
- Very less quantity of chaff material deployed in the air acts as decoy to deflect enemy's missiles for safety of the ships.

Where the technology been developed?

- The technology has been developed by DRDO's defense laboratory situated in **Jodhpur, Rajasthan** in collaboration with high energy materials research laboratory in Pune.
- The technology was developed in **three variants**.

Key Facts:

- Defense Laboratory earlier this year indigenously **developed three variants of chaff technology**:
 - Short Range Chaff Rocket (SRCR),
 - Medium Range Chaff Rocket (MRCR) and
 - Long-Range Chaff Rocket (LRCR).
- The Indian Navy conducted trials of all three variants in the Arabian Sea on Indian Naval Ship and found the performance satisfactory.

Difference between chaff and flares:

- Both are used to as **defensive countermeasure to confuse the radar** from detecting a vessel, or deflect the missiles from the target.
- While flares, when fired, generate a strong infrared source to attract heat-seeking missiles, **chaff is used to misguide radar-tracking weapons**.
- Chaff is **composed of many small aluminium or zinc coated fibres**. It will be stored on-board the aircraft as cartridges.

Prelims Practice Questions

1. Consider the following statements:

1. The World Meteorological Organization (WMO) is a UN specialised agency.
2. It was established following the Vienna International Meteorological Congress, 1873.
3. The 'State of the Global Climate' report is released by WMO.

Which of the statements given above is/are correct?

- A 1 only
- B 2 and 3 only
- C 3 only
- D 1 and 3 only

Answer : D

Explanation

- **World Meteorological Organization** is an intergovernmental organization with a membership of 192 Member States and Territories. India is a member.
 - It originated from the International Meteorological Organization (IMO), which was established after the 1873 Vienna International Meteorological Congress.
- **WMO was established by the ratification of the WMO Convention** on 23rd March 1950, WMO became the specialized agency of the United Nations for **meteorology** (weather and climate), operational hydrology and related geophysical sciences. **Hence, statement 1 is correct but statement 2 is not correct.**
- **Headquarters:** Geneva, Switzerland.
- **Reports released by WMO:**
 - **State of the Global Climate.** Hence, statement 3 is correct.
 - Greenhouse Gas Bulletin

2. Which of the given statements with respect to Majuli island is/are correct?

1. It is the nerve centre of neo-Vaishnavite spiritualism.

2. It is the only geo-heritage site in Assam.
3. It is one of the smallest inhabited islands in the Brahmaputra and a floating wildlife habitat.

Options:

- a. 1 and 2 only
- b. 2 and 3 only
- c. 1 only
- d. 1, 2 and 3

Answer: c

Explanation:

- Majuli is a river island in the Brahmaputra River, Assam and in 2016 it became the first island to be made a district in India.
- It is among the world's largest. The island is also the hub of spiritualism in Assam because of a number of 'satras' or Vaishnav monasteries established by the 15th-16th century saint-reformer Srimanta Sankaradeva and his disciples.
- There are two geo heritage sites in Assam. Other than Majuli it includes the **Umananda island**. It is one of the smallest inhabited islands in the Brahmaputra. The island is actually an inselberg, composed of the rocks of the Assam-Meghalaya gneissic complex.

3. With reference to the Tungabhadra River, Consider the following statements:

1. It is a tributary of Krishna River, which drains into the Arabian Sea.
2. Pampa Sagar Dam is built across Tungabhadra River.
3. It's major tributaries are the Bhadra, Haridra, Vedavati, Tunga.

Which of the above statements is/are correct?

- A 1 only
- B 2 only
- C 2 and 3 only
- D 1, 2 and 3 only

Answer : C

Explanation

- It is a sacred river in southern India that flows through the **state of Karnataka to Andhra Pradesh**. The ancient name of the river was Pampa. The river is approximately 710 km long, and it drains an area of 72,200 sq km.
 - It flows in a **more or less northwest direction** before joining the **eastern river Krishna**. The Krishna River finally ends into the Bay of Bengal. **Hence, statement 1 is not correct.**
- Tungabhadra dam also known as **Pampa Sagar** is a multipurpose dam built across Tungabhadra River in Hosapete, Ballari district of Karnataka. It was built by **Dr. Thirumalai Iyengar** in 1953. **Hence, statement 2 is correct.**
- It's major tributaries are the **Bhadra, the Haridra, the Vedavati, the Tunga, the Varda and the Kumdavathi**. **Hence, statement 3 is correct.**

4. Which of these UNESCO World Heritage Sites in are known for the Stone Chariots?

1. Mahabalipuram
2. Konark Sun Temple
3. Pattadakal
4. Hampi

Options:

- a. 1, 2 and 4 only
- b. 2 and 3 only
- c. 1 and 4 only
- d. 1, 2, 3 and 4

Answer: a

Explanation:

- Mahabalipuram, Konark Sun Temple and Hampi are known for the stone chariots.
- Pattadakal, is a complex of 7th and 8th century CE Hindu and Jain temples in northern Karnataka. Pattadakal represents the high point of an eclectic art which, in the 7th and 8th centuries under the Chalukya dynasty, achieved a harmonious blend of architectural forms from northern and southern India.

5. Binance, often seen in the news recently, refers to?

- a. A Cryptocurrency Exchange
- b. A notice issued to a fugitive economic offender
- c. A microprocessor to carry out cryptographic operations
- d. A stage of a market cycle where asset prices rise to irrationally high levels

Answer : a

Binance

- It is a cryptocurrency exchange that provides a platform for trading various cryptocurrencies.
- The exchange offers a wide range of services to users across the globe, from cryptocurrency spot and derivatives trading to loans and non-fungible tokens.
- It also runs a "decentralised" exchange that allows users to trade directly with each other.
- Its own cryptocurrency, Binance Coin, is the third-biggest in the world, with some \$68 billion-worth in circulation.
- The global financial regulators were concerned over the use of crypto in money laundering.
- They have targeted Binance and some have banned the platform from certain activities, while others have warned consumers that it was unlicensed to operate.
- The platform has said that it would demand stricter background checks on customers to bolster efforts against money laundering, with immediate effect.

6. With reference to Greenland, consider the following statements:

1. It is the world's largest island between the Arctic and Atlantic Oceans.
2. It has three-quarters of its surface covered with a permanent ice sheets.
3. Recently, for the 1st time on record, the summit of Greenland received rainfall and not snow.

Which of the statement(s) given above is/are correct?

- a. 1 only

- b. 2 only
- c. Both 1 and 2
- d. None

Answer : C

Rain at Greenland Summit

- For the 1st time on record, the summit of Greenland received rain and not snow, just as temperatures at the spot went above freezing for the 3rd time in less than 10 years.
- This was the heaviest rainfall that the Greenland received since record keeping began in 1950.
- Greenland is the world's largest island between the Arctic and Atlantic Oceans.
- Three-quarters of its surface is covered with a permanent ice sheet.
- At the highest point on Greenland's ice sheet, the US's National Science Foundation maintains a Summit Station, a research facility that observes changes occurring over the island as well as in Arctic weather.
- The research facility observed rain at the normally frigid summit, with the precipitation extending up to Greenland's southeast coast.
- Not only is water warmer than the usual snow, it's also darker - so it absorbs more sunlight rather than reflecting it away.
- Rain & high temperatures triggered extensive melting here, which is 7 times more than daily average observed at this time (August) of the year.
- Rapid ice melting will be running off into the ocean in volumes, thus accelerating global sea level rise.
- **Concern** - The UN's "code red" climate report concluded that the burning of fossil fuels led to Greenland melting in the last 20 years.
- Arctic Ocean may witness ice-free summers by 2050 due to extreme climate interventions.
- If that happens, sea levels could rise by 20 feet, threatening low-lying cities around the world such as Mumbai, New York, etc.
- Rapid melting is also threatening polar bears, which have to make their way towards Greenland's interior from the coasts, where they usually find enough food.

Mains Practice Questions

1Q. Including more women in science and applied technologies is critical for the advancement of society. Discuss.

Approach

- Start the answer by mentioning the status of gender equality in India.
- Discuss the status of women in Science, Technology, Engineering, Mathematics (STEM) fields.
- Suggest some measures to improve women's participation in STEM fields.
- Conclude Suitably.

2Q. What do you understand by DeepFake? Discuss the challenges posed by DeepFake. (150 words)

Approach

- Explain how the deepfake works.
- Highlight some challenges posed by deepfake technology.
- In conclusion highlight some measures to overcome these challenges