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NOVEMBER 2022

What's special

- The Mediation Bill, 2021
- National Credits Framework (NCrF)
- Global Hunger Index (GHI) 2022
- Nobel Prize 2022
- WHO Global TB Report 2022
- Swachh Survekshan Awards 2022

- Living Planet Report 2022
- 'Child Marriage Free India' campaign
- Approval of GM mustard
- World Green City Award 2022
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THE MEDIATION BILL, 2021

Context:
- The Mediation Bill, 2021 was introduced in the Rajya Sabha in December 2021, with the Parliamentary Standing Committee being tasked with a review of the Bill. The committee's report to the Rajya Sabha was submitted in July 2022.
- In its report, the Committee recommends substantial changes to the Mediation Bill, aimed at institutionalising mediation and establishing the Mediation Council of India.

Why does India need to promote mediation?
- While there is no standalone legislation for mediation in India, there are several statutes containing mediation provisions, such as the Code of Civil Procedure, 1908, the Arbitration and Conciliation Act, 1996, the Companies Act, 2013, the Commercial Courts Act, 2015, and the Consumer Protection Act, 2019.
- The Mediation and Conciliation Project Committee of the Supreme Court of India describes mediation as a tried and tested alternative for conflict resolution.
- As India is a signatory to the Singapore Convention on Mediation (formally the United Nations Convention on International Settlement Agreements Resulting from Mediation), it is appropriate to enact a law governing domestic and international mediation.

What are the key features of the Bill?
- The Bill aims to promote, encourage, and facilitate mediation, especially institutional mediation, to resolve disputes, commercial and otherwise.
- The Bill further proposes mandatory mediation before litigation. At the same time, it safeguards the rights of litigants to approach competent adjudicatory forums/courts for urgent relief.
- The mediation process will be confidential and immunity is provided against its disclosure in certain cases.
- The outcome of the mediation process in the form of a Mediation Settlement Agreement (MSA) will be legally enforceable and can be registered with the State/district/taluk legal authorities within 90 days to ensure authenticated records of the settlement.
- The Bill establishes the Mediation Council of India and also provides for community mediation.

What are the concerns with the Bill?
Article 21:
- According to the Bill, pre-litigation mediation is mandatory for both parties before filing any suit or proceeding in a court, whether or not there is a mediation agreement between them. Parties who fail to attend pre-litigation mediation without a reasonable reason may incur a cost.
- However, as per Article 21 of the Constitution, access to justice is a constitutional right which cannot be fettered or restricted. Mediation should just be voluntary and making it otherwise would amount to denial of justice.

Clause 26 of the Bill:
- Additionally, according to Clause 26 of the Bill, court-annexed mediation, including pre-litigation mediation, will be conducted in accordance with the directions or rules framed by the Supreme Court or High Courts. However, the Committee objected to this.
- It stated that Clause 26 went against the spirit of the Constitution. In countries that follow the Common Law system, it is a healthy tradition that in the absence of statutes, apex court judgments and decisions carry the same weight.
- The moment a law is passed however, it becomes the guiding force rather than the instructions or judgments given by the courts. Therefore, Clause 26 is unconstitutional.

Cross-border mediation:
- Furthermore, the Bill considers international mediation to be domestic when it is conducted in India with the settlement being recognised as a judgment or decree of a court.
- The Singapore Convention does not apply to settlements that already have the status of judgments or decrees. As a result, conducting cross-border mediation in India will exclude the tremendous benefits of worldwide enforceability.

What next?

➲ In order to enable a faster resolution of disputes, the Bill should be implemented after discussion with stakeholders.

➲ If the issues of the Bill aren't fixed, our aspirations to become an international mediation hub for easy business transactions could be crushed before they've even begun.

THE CRITERION FOR SC STATUS

Why in news?

➲ The Supreme Court of India has sought the most recent position of the Union government on a batch of petitions challenging the Constitution (Scheduled Castes) Order of 1950, which allows only members of Hindu, Sikh and Buddhist religions to be recognised as SCs.

Who all are included in the Constitution Order of 1950?

➲ When enacted, the Constitution (Scheduled Castes) Order of 1950, initially provided for recognising only Hindus as SCs, to address the social disability arising out of the practice of untouchability.

➲ The Order was amended in 1956 to include Dalits who had converted to Sikhism and once more in 1990 to include Dalits who had converted to Buddhism.

➲ Both amendments were aided by the reports of the Kaka Kalelkar Commission in 1955 and the High Powered Panel (HPP) on Minorities, Scheduled Castes and Scheduled Tribes in 1983 respectively.

➲ On the other hand, the Union government in 2019 rejected the possibility of including Dalit Christians as members of SCs, rooting the exclusion on an Imperial Order of 1936 of the then colonial government, which had first classified a list of the Depressed Classes and specifically excluded "Indian Christians" from it.

Why are Dalit Christians excluded?

➲ Ever since the amendment to include Sikhs as SCs in 1956, the Office of the Registrar General of India (RGI) has been reluctant in expanding the ambit of the Order beyond members of Hinduism or Sikhism.

➲ Responding to the Ministry of Home Affairs's (MHA) 1978 request for an opinion on the inclusion of Dalit

Buddhists and Christians, the RGI had cautioned the government that SC status is meant for communities suffering from social disabilities arising out of the practice of untouchability, which it noted was prevalent in Hindu and Sikh communities. It also noted that such a move would significantly swell the population of SCs across the country.

➲ However, the amendment to include Buddhist converts as SCs was passed in 1990, which at the time did not require the approval of the RGI — a mandate introduced in the rules for inclusion framed in 1999.

➲ In 2001, when the RGI again opined against including Dalit Christians and Muslims as SCs, it referred to its 1978 note and added that like Dalit Buddhists, Dalits who converted to Islam or Christianity belonged to different sets of caste groups and not just one, as a result of which they cannot be categorised as a "single ethnic group", which is required by Clause (2) of Article 341 for inclusion.

➲ Moreover, the RGI opined that since the practice of "untouchability" was a feature of Hindu religion and its branches, allowing the inclusion of Dalit Muslims and Dalit Christians as SCs could result in being "misunderstood internationally" as India trying to "impose its caste system" upon Christians and Muslims.

➲ The 2001 note also stated that Christians and Muslims of Dalit origin had lost their caste identity by way of their conversion and that in their new religious community, the practice of untouchability is not prevalent.

Is there a case for inclusion?

➲ The petitions arguing for inclusion have cited several independent Commission reports that have documented the existence of caste and caste inequalities among Indian Christians and Indian Muslims, noting that even after conversion, members who were originally from SCs continued to experience the same social disabilities.

➲ This was substantiated in the First Backward Classes Commission's report in 1953, the Report of the Committee on Untouchability Economic and Educational Development Of the Scheduled Castes in 1969, the HPP report on SCs, STs, and Minorities in 1983, the Mandal Commission Report, the report of the Prime Minister's High-Level Committee formed in 2006, a 2008 study conducted by the National Commission for Minorities, the Ranganath Misra Commission Report and several other studies.

➲ In addition to this, the petitions have argued against the proposition that caste identity is lost upon conversion, noting that even in Sikhism and Buddhism, casteism is not present and yet they have been included as SCs.

➲ Furthermore, the above-mentioned reports argue that caste-based discrimination continues even after

conversion, hence entitling these communities to SC status. However, the Union government refuses to accept the reports of the Commissions on the basis that these reports do not have enough empirical evidence to support their claims.

Is this the first time the government has considered this issue?

- The closest a government has got to including Dalit Christians as SCs came in March, 1996, when based on a recommendation of the then Ministry of Welfare, the P. V. Narsimha Rao government first brought a Bill to amend the Constitution (Scheduled Castes) Order accordingly.
- When this could not be passed, the government within days attempted to include Dalit Christians as SCs through an Ordinance, which was sent to the President of India for assent after the due approval of the erstwhile Prime Minister, but could not then be promulgated.
- Following this failed attempt, the Atal Bihar Vajpayee government had in 2000 repeatedly sought the opinion of the Office of the RGI and the then National Commission for Scheduled Castes and Scheduled Tribes on whether Dalit Christians could be included. Both had recommended against the proposition.
- Apart from this, several attempts have been made from time to time by way of introducing Private Member Bills to amend the Constitution Order to include Dalit Christians and Dalit Muslims as SCs but these have all failed.

PARLIAMENT COMMITTEES & THEIR ROLE IN LAW-MAKING

Why in news?

- A revamp of the Standing Committees of Parliament could potentially worsen the relations between the government and opposition parties.
- Of the 22 committees announced recently, the Congress has the post of chairperson in only one, and the second largest opposition party, Trinamool Congress, none. The ruling BJP has the chairmanship of the important committees on Home, Finance, IT, Defence and External Affairs.

What are Committees of Parliament?

- Legislative business begins when a Bill is introduced in either House of Parliament. But the process of lawmaking is often complex, and Parliament has limited time for detailed discussions.
- Also, the political polarisation and shrinking middle ground has been leading to increasingly rancorous and inconclusive debates in Parliament, as a result of which a great deal of legislative business ends up taking place in the Parliamentary Committees instead.

- A Parliamentary Committee is a panel of MPs that is appointed or elected by the House or nominated by the Speaker, and which works under the direction of the Speaker. It presents its report to the House or to the Speaker.
- Parliamentary Committees have their origins in the British Parliament.
- They draw their authority from Article 105, which deals with the privileges of MPs, and Article 118, which gives Parliament authority to make rules to regulate its procedure and conduct of business.

What are the various Committees of Parliament?

- Broadly, Parliamentary Committees can be classified into Financial Committees, Departmentally Related Standing Committees, Other Parliamentary Standing Committees, and Ad hoc Committees.
- The Financial Committees include the Estimates Committee, Public Accounts Committee, and the Committee on Public Undertakings. These committees were constituted in 1950.

Departmentally Related Standing Committees:

- Seventeen Departmentally Related Standing Committees came into being in 1993, when Shivraj Patil was Speaker of Lok Sabha, to examine budgetary proposals and crucial government policies.
- The aim was to increase Parliamentary scrutiny, and to give members more time and a wider role in examining important legislation.
- The number of Committees was subsequently increased to 24. Each of these Committees has 31 members — 21 from Lok Sabha and 10 from Rajya Sabha.
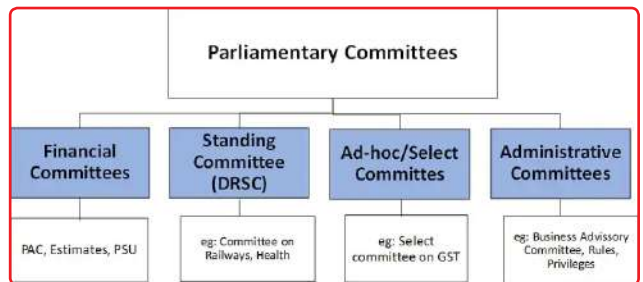
Ad hoc Committees:

- Ad hoc Committees are appointed for a specific purpose. They cease to exist after they have completed the task assigned to them, and have submitted a report to the House.
- The principal Ad hoc Committees are the Select and Joint Committees on Bills. Committees like the Railway Convention Committee, Committee on Food Management and Security in Parliament House Complex, etc. also come under the category of Ad hoc Committees.
- Parliament can also constitute a Joint Parliamentary Committee (JPC) with a special purpose, with

members from both Houses, for detailed scrutiny of a subject or Bill. Also, either of the two Houses can set up a Select Committee with members from that House.

- JPCs and Select Committees are usually chaired by ruling party MPs, and are disbanded after they have submitted their report.

How do discussions/ debates in the Parliamentary Committees differ from those in Parliament?

- The time to speak on a Bill is allocated according to the size of the party in the House. MPs often do not get adequate time to put forward their views in Parliament, even if they are experts on the subject.
- Committees are small groups with relatively less demands on their time; in these meetings, every MP gets a chance and the time to contribute to the discussion. Parliament has only around 100 sittings a year; Committee meetings are independent of Parliament's calendar.
- Also, because the discussions are confidential and off-camera, party affiliations usually do not come in the way of MPs speaking their minds in ways they are unable to do in Parliament, whose proceedings are telecast live and members are often constrained to speak to their constituencies.
- The Committees work closely with multiple Ministries, and facilitate inter-ministerial coordination. Bills that are referred to Committees often return to the House with significant value-addition.
- The Committees look into the demands for grants of Ministries/departments, examine Bills pertaining to them, consider their annual reports, and look into their long-term plans and report to Parliament.

How are the Committees constituted, and how are their chairpersons chosen?

- There are 16 Departmentally Related Standing Committees for Lok Sabha and eight for Rajya Sabha; however, every Committee has members from both Houses. Lok Sabha and Rajya Sabha panels are headed by members of these respective Houses.
- Among the important Lok Sabha panels are: Agriculture; Coal; Defence; External Affairs; Finance; Communications & Information Technology; Labour; Petroleum & Natural Gas; and Railways.
- The important Rajya Sabha panels include Commerce; Education; Health & Family Welfare; Home Affairs; and Environment.
- There are other Standing Committees for each House, such as the Business Advisory Committee and the Privileges Committee. The Presiding Officer of each House nominates members to these panels. A Minister is not eligible for election or nomination to Financial Committees, and certain Departmentally Related Committees.

How important are the recommendations of the Committees?

- Reports of Departmentally Related Standing Committees are recommendatory in nature. They are not binding on the government, but they do carry significant weight.
- In the past, governments have accepted suggestions given by the Committees and incorporated them into the Bill after it has come back to the House for consideration and passage.
- These panels also examine policy issues in their respective Ministries and make suggestions to the government. The government has to report back on whether these recommendations have been accepted. Based on this, the Committees table Action Taken Reports, detailing the status of the government's action on each recommendation.
- However, suggestions by the Select Committees and JPCs which have a majority of MPs and heads from the ruling party are accepted more frequently.

THE ONLINE GAMING MARKET IN INDIA

Why in news?

- An inter-ministerial task force, set up by the Ministry of Electronics and Information Technology (MeitY) in May 2022 has recently submitted its report.
- It was set up to propose contours of a national-level legislation to regulate online gaming.

Details:

- It has proposed the creation of a central regulatory body for the sector, clearly defining what games of skill and chance are, and bringing online gaming under the purview of the Prevention of Money Laundering Act, 2002, among other things.
- The task force included the CEO of government think tank Niti Aayog, and secretaries of ministries including IT, Home, Finance, Information and Broadcasting, and Consumer Affairs, among others.
- The task force is understood to have prepared a final report of its recommendations and submitted it to the IT Ministry.

Why a central-level law?

- Online gaming so far has been a state subject, but state governments have said they find it extremely

difficult to enforce certain rules like geo-blocking certain apps or websites within the territory of their state.

➲ Also, there is a concern that rules passed in one state are not applicable in another, which has caused inconsistency in how the online gaming industry is regulated in the country. State governments also do not have enough blocking powers like the Centre to issue blocking orders for offshore betting sites.

Challenges:

➲ Stakeholders have highlighted a number of societal concerns that can arise from the proliferation of online games in the country. There have been a number of reported incidents of people losing large sums of money on online games, leading to suicides in various parts of the country.

➲ Along with that, there is currently no regulatory framework to govern various aspects of online gaming companies such as having a grievance redressal mechanism, implementing player protection measures, protection of data and intellectual property rights, and prohibiting misleading advertisements.

➲ For online gaming businesses, the inconsistency has led to uncertainty. The thinking within the government is to have a nodal agency that will address all issues related to online gaming, including introducing a uniform law to determine what forms of online gaming are legally allowed.

How big is the online gaming market in India?

➲ The revenue of the Indian mobile gaming industry is expected to exceed $1.5 billion in 2022, and is estimated to reach $5 billion in 2025.

➲ The industry in the country grew at a CAGR of 38% between 2017-2020, as opposed to 8% in China and 10% in the US. It is expected to grow at a CAGR of 15% to reach Rs 153 billion in revenue by 2024.

➲ India's percentage of new paying users (NPUs) in gaming has been the fastest growing in the world for two consecutive years, at 40% in 2020 and reaching 50% in 2021.

➲ According to a report by EY and FICCI, transaction-based games' revenues grew 26% in India, with the number of paying gamers increasing by 17% from 80 million in 2020 to 95 million in 2021.

What are the recommendations of the task force?

➲ A central-level law for online gaming should apply to real money and free games of skill, including e-sports, online fantasy sports contests, and card games among others.

➲ Casual games with no real money element in the form of stakes may be kept outside the scope of such rules, unless they have a high number of users in India, or permit the publication or transmission of information in the nature of any inappropriate content like violence, nudity, addictive content or misleading content.

➲ It has also recommended creating a regulatory body for the online gaming industry, which will determine what qualifies as a game of skill or chance, and accordingly certify different gaming formats, seek compliance and enforcement.

➲ A three-tier dispute resolution mechanism, similar to that prescribed under the Information Technology Rules, 2021 for online streaming services, consisting of a grievance redressal system at the gaming platform level, self regulatory body of the industry, and an oversight committee led by the government should be put in place for online gaming.

➲ Any online gaming platform – domestic or foreign– offering real money online games to Indian users will need to be a legal entity incorporated under Indian law.

➲ These platforms will also be treated as 'reporting entities' under the Prevention of Money Laundering Act, 2002, and will be required to report suspicious transactions to the Financial Intelligence Unit-India.

Which ministry will be in charge of the regulation?

➲ The task force has suggested that MeitY may act as the nodal ministry to regulate online gaming, except for the e-sports category on which the Department of Sports can take the lead.

➲ The scope of the regulation by MeitY should only cover online gaming, that is, games of skill, and the issues of online betting and gambling being games of chance in nature should be excluded from its scope, the task force is learnt to have recommended.

➲ Certain other aspects of online gaming such as advertisements, code of ethics relating to content classifications etc. could be regulated by the Information and Broadcasting Ministry, while the Consumer Affairs Ministry can regulate the sector for unfair trade practices.

What did the task force say about offshore betting apps?

➲ On the aspect of prohibiting games of chance, gambling websites or apps being played online, the proposed Digital India Act can include it in the list of prohibited user harms that will not be permitted.

➲ "Many offshore betting and gambling websites which are illegal in India have become popular among Indian users. Despite being based outside India, some of these websites are widely advertised in Indian newspapers and TV channels, and allow users to transact in Indian rupees through popular digital payment modes such as internet banking, UPI and popular wallets.

NO CITIZEN CAN BE PROSECUTED UNDER SCRAPPED SECTION 66A OF IT ACT: SC

Why in news?

➲ Recently, the Supreme Court (SC) directed no citizen can be prosecuted under section 66A of the

Information Technology Act, 2000, which it had scrapped way back in 2015.

Background:

- Underlining that liberty of thought and expression is of 'cardinal' significance, SC had on March 24, 2015 done away with the provision, saying the public's right to know is directly affected by Section 66A of the Information Technology Act.
- Under the annulled section, a person posting offensive content could be imprisoned for up to three years and also fined.

Key Highlights:

- A bench headed by Chief Justice said in all cases where citizens are facing prosecution for alleged violation of section 66-A of the Act, the reference and reliance upon the said provision shall stand deleted.
- The top court clarified that this direction shall apply only with respect to offence punishable under section 66A, and if in the crime in question, other offences are also alleged, then the reference and reliance upon section 66A alone shall be deleted.

Concerns:

- The bench observed the counsel appearing for the Centre has placed on record an all-India status report with regard to pending cases under section 66A.
- It observed the information given in a tabular form does suggest that despite the issue regarding the validity of section 66A of the Act having been decided by the apex court, a number of criminal proceedings still rely upon this provision and citizens are still facing prosecution.
- The bench also said whenever any publication, whether government, semi-government and private, about the IT Act is published and section 66A is quoted as part of the statute book, the reader must adequately be informed that section 66A has already been pronounced upon by the apex court to be violative of the Constitution.
- Calling a "matter of serious concern" the registration of FIRs under section 66A of the Act which was scrapped in 2015, the apex court had recently asked the chief secretaries of the states concerned to take back the cases within three weeks.

What was the case before SC?

- The bench was hearing a miscellaneous application of NGO 'People's Union for Civil Liberties' (PUCL) alleging prosecution of people under the scrapped provision.
- The NGO claimed that despite express directions of the court in 2019 that all state governments sensitise police personnel about the March 24, 2015 judgement, thousands of cases have been registered under the section.

Singhal v. Union of India:

- The Supreme Court of India initially issued an interim measure in Singhal v. Union of India, (2013) prohibiting any arrest pursuant to Section 66A unless such arrest is approved by senior police officers.
- On February 15, 2019, the top court had directed all state governments to sensitise their police personnel about its March 24, 2015 verdict, which had scrapped section 66A of the Act, so people are not unnecessarily arrested under the struck-down provision.
- The first PIL on the issue was filed in 2012 by law student Shreya Singhal who sought an amendment to section 66A of the Act after two girls - Shaheen Dhada and Rinu Shrinivasan - were arrested in Palghar in Maharashtra's Thane district.
- While one had posted a comment against the shutdown in Mumbai following Shiv Sena leader Bal Thackeray's death, the other had 'liked' it.
- PUCL was also one of the petitioners in the earlier case and had challenged the constitutional validity of Section 66A of the Act.

ATHLETE BIOLOGICAL PASSPORT PROGRAMME HIGHLIGHTED

Why in news?

- Recently, the National Anti Doping Agency (NADA) & National Dope Testing Laboratory (NDTL) India hosted the 3rd edition of the World Anti Doping Agency (WADA) Athlete Biological Passport (ABP) Symposium in New Delhi.

What is Athlete Biological Passport (ABP)?

- Athlete Biological Passport (ABP), a powerful anti-doping tool that monitors selected biological variables

over time to reveal the effects of doping rather than attempting to detect the doping substance or method itself.

➲ It works against doping through enhanced target testing and analysis, investigations, deterrence, and as indirect evidence for use of prohibited methods or substances.

When ABP was approved?

➲ WADA's Athlete Biological Passport Operating Guidelines (ABP Guidelines) were first approved by WADA's Executive Committee and took effect on 1 December 2009.

➲ This first version contained a standardized approach to the profiling of individual Athlete Haematological variables for the detection of blood doping.

➲ In 2014, the initial system was complemented with the Steroidal Module, which was launched to establish longitudinal profiles of an athlete's steroid variables measured in urine samples.

Key Highlights:

➲ Round table discussion about recent trends, successes and challenges of ABP program was held amongst the galaxy of ABP experts and focused on the need to implement the ABP program.

➲ Discussions on ABP included need to create a robust legal framework.

➲ The major challenges elaborated were resources, funding and reactive follow up testing.

About WADA ABP Symposium:

➲ The first WADA ABP Symposium was hosted by the Anti-Doping Lab Qatar (ADLQ) in November 2015, in Doha, Qatar.

➲ The second WADA ABP Symposium was organized by the Italian Federation of Sports Medicine (FMSI) and was held from 5-7 November 2018, in Rome, Italy.

➲ In the 3rd edition being held in India, over Two hundred participants from 56 Countries participated in the Symposium.

Way Forward:

➲ Hosting the ABP symposium demonstrates India's capabilities and willingness to contribute towards promoting dope free sports in a bigger way.

➲ The event is special for India as the country is celebrating 75 years of independence – Azadi Ka Amrit Mahotsav.

SC DELIVERS SPLIT VERDICT IN KARNATAKA HIJAB BAN ROW

Why in news?

➲ Recently, the Supreme Court delivered a split verdict on the hijab ban in Karnataka's educational institutions, with one judge holding permitting a community to wear its religious symbols will be an "antithesis to secularism" and the other insisting that

wearing the Muslim headscarf should be simply a "matter of choice".

What is a split verdict?

➲ A split verdict is passed when the Bench cannot decide one way or the other in a case, either by a unanimous decision or by a majority verdict. Split verdicts can only happen when the Bench has an even number of judges.

➲ This is why judges usually sit in Benches of odd numbers (three, five, seven, etc.) for important cases, even though two-judge Benches, known as Division Benches are not uncommon.

What was the judgement?

➲ While Justice Hemant Gupta dismissed the appeals challenging the March 15 judgement of the Karnataka High Court which had refused to lift the ban, Justice Sudhanshu Dhulia held there shall be no restriction on the wearing of hijab anywhere in the schools and colleges of the state.

➲ With the apex court delivering a split verdict, the high court's judgement still holds the field. However, the split verdict held off a permanent resolution of the vexed row over hijab as both judges suggested placing the matter before a larger bench for adjudication.

Justice Hemant Gupta:

➲ In his verdict upholding the March 15 Karnataka High Court ruling validating the ban on wearing hijab in classrooms, he rejected the argument that denying students the right to wear a headscarf also denies them the right to attend classes, saying "it would… not amount to denial of right to education if a student, by choice, does not attend the school."

➲ He said "the students are attending an all-girls' college" and "are at liberty to carry their religious symbols outside the schools but in pre-university college, the students should look alike, feel alike, think alike and study together in a cohesive cordial atmosphere. That is the objective behind a uniform, so as to bring about uniformity in appearances".

➲ Upholding the power of the state government to constitute College Development Committees (CDCs) under the Karnataka Education Act, 1973 and delegate the decision to implement the uniform to it as per the February 5, 2022 Government Order (GO), he said

the "intent and object" of the GO "is only to maintain uniformity amongst the students by adherence to the prescribed uniform and "is reasonable as the same has the effect of regulation of the right (of freedom of speech and expression) guaranteed under Article 19(1)(a)."

➲ He reiterated that no fundamental right is absolute and can be curtailed by following due procedure, and that the freedom of conscience and religion under Article 25 is subject to restrictions provided under Article 25(1). "Such right is not just subject to public order, morality and health but also 'other provisions of Part III'. This would also include Article 14 which provides for equality before law."

➲ He also found it unnecessary to send the matter to the nine-judge SC Bench which will examine questions of law arising in the Sabarimala review petitions, saying it was set up "to consider much wider questions", or to a five-judge Constitution Bench as it does not "raise any substantial question of law".

Justice Sudhanshu Dhulia:

➲ Setting aside the Karnataka High Court verdict, he sought to interpret the debate from the point of view of promoting diversity, and providing educational opportunities to women.

➲ He said that "under our Constitutional scheme, wearing a hijab should be simply a matter of Choice."

➲ He took exception to the High Court's finding that the petitioners cannot assert their "fundamental rights" inside a classroom, which it termed a "qualified public place". The HC had referred to courts, war rooms, defence camps, etc., as other examples of qualified public spaces where freedom of individuals is curtailed as per necessity.

➲ "Asking a pre university schoolgirl to take off her hijab at her school gate, is an invasion on her privacy and dignity. It is clearly violative of the Fundamental Right given to her under Article 19(1)(a) and 21 of the Constitution of India. This right to her dignity and her privacy she carries in her person, even inside her school gate or when she is in her classroom. It is still her Fundamental Right, not a "derivative right" as has been described by the High Court."

➲ He referred to submissions that the fallout of the hijab ban has been that some students have not been able to appear in their Board examinations, and many others have had to seek transfer to other schools, most likely madrasas, where they may not get the same standard of education.

Background:

➲ On March 15, the high court had dismissed the petitions filed by a section of Muslim students of the Government Pre-University Girls College in Karnataka's Udupi seeking permission to wear the hijab inside classrooms, ruling it is not a part of the essential religious practice in Islamic faith.

Way Forward:

➲ In case of a split verdict, the case is heard by a larger Bench. The larger Bench to which a split verdict goes can be a three-judge Bench of the High Court, or an appeal can be preferred before the Supreme Court.

➲ In the case of the hijab verdict, the CJI, who is the 'master of the roster', will constitute a new, larger Bench to hear the matter.

SUTLEJ-YAMUNA LINK CANAL

Why in news?

➲ Recently, the Haryana Chief Minister met his Punjab counterpart in Chandigarh to discuss the Sutlej-Yamuna Link (SYL) canal issue.

➲ While Haryana wants to restart the construction which stopped in the 1990s, Punjab has said it does not have a drop of water to spare.

➲ It's a dispute between Haryana and Punjab that has been going on for more than fifty years.

What is the SYL canal?

➲ The SYL canal is a proposed 214-kilometre-long canal connecting Sutlej and Yamuna rivers. It was planned in 1966 after the state of Haryana was carved out of Punjab.

➲ While the decision to share resources was taken, the terms on sharing waters of two rivers, Ravi and Beas, were left undecided.

➲ Punjab, however, was against sharing waters of the two rivers with neighbouring Haryana, citing riparian principles, which state that the owner of land adjacent to a water body has the right to use the water, besides arguing that it had no water to spare.

What did the Indian government say about water sharing?

➲ In 1976, a decade after the reorganisation of Punjab, the Centre issued a notification that both states will receive 3.5 million acre-feet (MAF) of water each.

➲ On 31 December 1981, an agreement was made between Punjab, Haryana and Rajasthan to reallocate the waters of Ravi and Beas in "overall national interest and for optimum utilisation of the waters". A reassessment was done and the water flowing down Beas and Ravi was estimated at 17.17 MAF. Of

this, 4.22 MAF was allocated to Punjab, 3.5 MAF to Haryana, and 8.6 MAF to Rajasthan, by agreement of all three states.

- On 8 April 1982, then-Prime Minister Indira Gandhi launched the construction of the YSL canal in Kapoori village, Patiala district. The canal was to be 214-kilometre long, of which 122 km was to run across Punjab and 92 km across Haryana.

Eradi Tribunal:

- Punjab's Shiromani Akali Dal (SAD) was not happy and launched a protest against the construction, the Kapoori Morcha.
- In July 1985, then-Prime Minister Rajiv Gandhi met then-SAD chief Harchand Singh Longowal and signed an accord, agreeing to a new tribunal to assess the water.
- The Eradi Tribunal was set up, headed by Supreme Court Judge V Balakrishna Eradi. In 1987, it recommended an increase in the shares of Punjab and Haryana to 5 MAF and 3.83 MAF, respectively.

How did militancy in Punjab make matters worse?

- However, Punjab saw a rise in militancy and the construction of the canal became a polarising issue.
- Longowal was killed by militants in August 1985, less than a month after signing the accord. In 1990, chief engineer M L Sekhri and a superintending engineer Avtar Singh Aulakh were also killed by militants. Several labourers working on the project were shot dead.
- In wake of the increasing violence, the construction of the SYL canal was stopped in the 1990s. A large part of it was built, costing over Rs 750 crore.

What has the Supreme Court said?

- In 2002, the Supreme Court (SC) directed Punjab to continue work on the SYL and complete it within a year. The state refused to oblige; instead, it petitioned for a review of the SC order, which was rejected.
- In 2004, following orders from the top court, the Central Public Works Department was appointed to take over the canal work from the Punjab government. However, the state continued to remain defiant.
- The Punjab Legislative Assembly passed the Punjab Termination of Agreements Act of 2004, which abrogated all its river water agreements with neighbouring states. Then-President Dr APJ Abdul Kalam referred this Bill to the Supreme Court to decide on its legality in the same year.
- The case came up for hearing in the top court in 2016. In November of that year, it said that the Punjab Termination of Agreements Act 2004, was illegal.
- However, Punjab decided to denotify 5,376 acres of land that was acquired for the canal and return it to its original owners free of cost.
- In February 2017, the SC stuck to its earlier verdict that the construction of the SYL has to be executed

and asked Haryana and Punjab to maintain law and order "at any cost".

What are Punjab's complaints?

- According to a study by the state government, many areas in Punjab will go dry by 2029. The state has already over-exploited its groundwater for irrigation purposes as it fills granaries of the Centre by growing wheat and paddy worth Rs 70,000 crore every year.
- Punjab maintains that it is not in a position to share water as the situation is dire.
- In July 2004, the Punjab Assembly enacted the Punjab Termination of Agreement Act, annulling all inter-state agreements signed by the state relating to sharing of Ravi and Beas waters.

What is the demand of Haryana government?

- Haryana believes it has been denied its rightful share of water. It says that providing irrigation is tough for the state. There was a problem with drinking water in southern parts of Haryana, where groundwater has depleted up to 1,700 feet, the newspaper reports.
- In April, Khattar moved a resolution urging the Centre to take measures for the construction of the SYL canal.

THE ISSUES IN THE COLLEGIUM'S FUNCTIONING

Context:

- A meeting of the Supreme Court Collegium, comprising the Chief Justice of India (CJI), and four senior-most judges, which was called recently but did not take place, was subsequently "closed without there being any further deliberation".
- What prevented further deliberations was the fact that the Union Law Minister, by a letter requested Chief Justice U.U. Lalit to nominate his successor, as the latter's tenure ends on November 8, 2022.
- The postponement of the meeting and its subsequent closure has invited attention to the manner in which the Collegium functions.

What is the work of the Collegium?

- The Collegium system, one in which a group of the senior-most judges make appointments to the higher judiciary, has been in practice for nearly three decades.

➲ Its importance lies in the fact that its opinion has primacy in the matter of appointments to the high courts and the Supreme Court, as well as transfers.

➲ Its legal basis is found in a series of three judgments or the 'Judges Cases' concerning the higher judiciary. Its manner of functioning has been laid down in the form of a 'Memorandum of Procedure'.

➲ The Constitution says a Supreme Court judge is appointed by the President in consultation with the Chief Justice of India.

'Judges Cases':

➲ In the 'First Judges Case', the court held that the consultation with the CJI should be "full and effective".

➲ The Second Judges case introduced the collegium system in 1993. It ruled that the CJI would have to consult a collegium of his two senior-most judges in the apex court on judicial appointments.

➲ The 'Third Judges Case' case in 1998, which was a Presidential reference, expanded the collegium to its present composition of the CJI and four of his senior-most judges.

How does it discharge its functions?

➲ The Collegium's functioning has been criticised for being opaque. Its resolutions and recommendations are hosted on the Supreme Court's website, giving relevant information about its decisions. However, the nature of the deliberations and whether there are any internal differences of opinion on the suitability of a particular candidate are unknown.

➲ It functions mainly through the system of adopting resolutions and sending them to the Union Law Ministry for further action.

➲ If a proposal for appointment of a judge is returned for reconsideration, the Collegium may either drop it or reiterate it. When the Collegium reiterates its decision after reconsideration, it is binding on the government.

Why was the September 30 meeting closed without result?

➲ The meeting had to be postponed because on that day, a member of the Collegium, Justice D.Y. Chandrachud, who will be the next Chief Justice of India, was preoccupied with his list of cases well beyond court hours.

➲ Subsequently, a difference of opinion has been acknowledged over the manner in which the deliberations were to go on.

➲ While Chief Justice Lalit wanted to circulate the files pertaining to some recommendations for appointment to the Supreme Court, two judges in the Collegium, Justice Chandrachud and Justice Abdul Nazeer, did not favour any decision through circulation. They preferred deliberations in person.

➲ Meanwhile, the Union Law Minister asked the Chief Justice to name his successor. By convention, once a

recommendation for the successor to the CJI's office is made, the Collegium ceases to make decisions.

➲ There is no law or rule that says the Collegium should become dysfunctional during the last month of a Chief Justice's tenure, but it is observed as a matter of convention. It may also be a matter of propriety, as judges likely feel that the incoming CJI should have his say in initiating proposals for appointments to the Supreme Court.

What are the issues from this development?

Three questions may have arisen from the development:

➲ One is whether there ought to be a prescribed mode of decision-making, that is, through personal deliberations or by circulation or by adopting both means as per convenience.

➲ The second is whether all members of the Collegium give their opinions in writing, or whether they convey reservations, if any, orally. A related question that arises is whether all decisions ought to be unanimous and consensual.

➲ There is a view that a recommendation by majority, with one or two expressing reservations, may give a good reason for the executive to reject the recommendation or seek reconsideration.

➲ Also, the need for the Collegium not to hold any deliberations in the last month of a Chief Justice's tenure is something to be debated.

➲ Given that the CJI is appointed by seniority, many of them have only a short tenure running into a few months. This convention may slow down decision-making.

HINDI IMPOSITION AND ITS DISCONTENTS

Why in news?

➲ The reported recommendation of the Parliamentary Committee on Official Language to use Hindi as the medium of instruction in Central institutions of higher education in Hindi-speaking States and regional languages in other States has once again ignited a controversy over, what is called as an attempt to impose Hindi on non-Hindi speaking people.

➤ Chief Ministers of Tamil Nadu and Kerala have voiced their concerns over the recommendation.

What is the backdrop to the Hindi imposition row?

➤ The origin of the linguistic row goes back to the debate on official languages. In the Constituent Assembly, Hindi was voted as the official language by a single vote. However, it added that English would continue to be used as an associate official language for 15 years.

➤ The Official Languages Act came into effect on the expiry of this 15-year period in 1965. This was the background in which the anti-Hindi agitation took place.

➤ However, as early as in 1959, Jawaharlal Nehru had given an assurance in Parliament that English would continue to be in use as long as non-Hindi speaking people wanted it.

Why do many parties in Tamil Nadu stand against the recommendation?

➤ Tamil Nadu has had a long history of agitations against "Hindi imposition".

➤ In August 1937, in the then Presidency of Madras, the regime headed by C. Rajagopalachari, also known as Rajaji or CR, decided to make Hindi compulsory in secondary schools. E.V. Ramasamy, or Periyar as he was known, who was still in the Justice Party at that time, had spearheaded an agitation against the move, marking the first such stir.

➤ A few months after CR's resignation, the British government, in February 1940, made Hindi optional.

➤ In January 1965, the second round of agitations erupted in the wake of Hindi becoming the official language of the Union government coupled with the approach adopted by the Central government towards the whole issue.

➤ At different points in time, leaders, starting from Jawaharlal Nehru in the mid-1950s, assured the people of Tamil Nadu that there would be no "imposition" of Hindi.

Recent attempts:

➤ However, in recent years, be it the National Education Policy or reports of English signage on National Highways in the State getting replaced with Hindi signage, the political class of the State had overwhelmingly expressed its reservations.

➤ The reiteration of the age-old assurance by the Central government coupled with the promise of the promotion of other Indian languages have barely mollified the protesters.

➤ The essence of the Official Languages Act, 1963, is to provide something to each of the differing groups to meet its objections and safeguard its position. Whenever the parties in the State see any attempt to disturb this status quo, their reaction is always uniform, a virulent opposition.

What does the present proposal say?

➤ If reports in sections of the media are an indication, English, as a medium of instruction in all technical and non-technical institutions, will be permitted only where it is absolutely essential, as the idea is to replace the language gradually with Hindi in those institutions.

➤ While IITs, IIMs and All India Institute of Medical Sciences are considered technical institutions, Kendriya Vidyalayas and Navodaya Vidyalayas fall under the other category.

➤ Also, the committee has recommended the removal of English as one of the languages in examinations held for recruitment to the Central services.

➤ It has stated that the requisite knowledge of Hindi among candidates should also be ensured.

What is the alternative suggested by critics of the proposal?

➤ They have called for equal treatment to all the languages specified under the Eighth Schedule of the Constitution.

➤ The Kerala Chief Minister has specifically stated that question papers for competitive examinations should be prepared in all the languages while his Tamil Nadu counterpart has urged the Centre to promote all languages and keep open the avenues of progress in terms of education and employment equal to speakers of all languages.

ENTITIES INVOLVED IN TRADE WOULD CEASE TO BE A CHARITABLE INSTITUTION: SC

Why in news?

➤ Any entity or institution involved in any trade or commerce under the guise of 'general public utility' will cease to be a 'charitable institution' and therefore, cannot claim tax exemption under the Income-Tax (I-T) Act, the Supreme Court (SC) ruled recently.

Two key issues were heard by the apex court:

a) One, scope of the expression 'general public utility' (deals with benefit to a section of the public) for claiming tax exemption as 'charitable institution'.

b) Two, scope of exemption to educational institutions claiming tax exemption as 'charitable institution'.

'Charitable purpose':

➲ The expression 'charitable purpose' has been defined under certain clauses which include relief to the poor, for education and medical relief, preservation of the environment (including watersheds, forests and wildlife), preservation of monuments, and the advancement of any other object of public utility.

➲ Many institutions doing trade/commerce used the 'general public utility' clause to gain exemption for profits on such trade/commerce since the meaning is ambiguous.

➲ The court has now clarified if any profit or margin is earned from such an activity, it shall cease to be a charitable activity.

➲ This judgment could have wide-ranging ramifications since charitable institutions involved in any trade or commerce in the name of the said provision could come under its radar and would be denied the benefit of tax exemption under the I-T Act available to them.

Charitable Educational institutions:

➲ The SC held that the object of such institutions must be "wholly, solely, and exclusively" for the purpose of education.

➲ It has ruled that if educational institutions are making profits and run for such an expressed purpose, then the benefit under Section 10(23C) of the I-T Act will not be extended to such institutions.

➲ The said Section provides that the income earned by any university or educational institution existing solely for educational purposes and not for purposes of profit shall be exempt from tax.

➲ Where the objective of the institution appears to be profit-oriented, such institutions would not be entitled to approval under Section 10(23C) of the I-T Act.

The rules so far:

➲ Charitable institutions are not subject to any tax, provided they are involved in "charitable" work.

➲ One of the clauses, general public utility, defined as charitable purposes, has been in question.

➲ General public utility is not clearly defined in the tax laws and is open to interpretation.

➲ Many trusts, institutions use the clause to claim tax benefits.

LAWS AGAINST BLACK MAGIC AND SUPERSTITION IN INDIA

Context:

➲ The brutal murders of two women as part of "ritualistic human sacrifices" in Pathanamthitta district of Kerala have left the country in shock.

➲ According to preliminary probe, the victims were subjected to extreme torture and sexually harassed, their body parts cut into several pieces before they were buried in a pit.

➲ Such chilling details of the killings that have emerged in the past few days have sparked a debate about the prevalence of superstitious beliefs, black magic, sorcery and other evil practices in a progressive State like Kerala.

NCRB data on deaths due to witchcraft and human sacrifices:

➲ The National Crime Records Bureau (NCRB), which maintains data on crimes in the country, provides data for deaths due to witchcraft and human sacrifices.

➲ As per the 2021 report, six deaths were linked to human sacrifices, while witchcraft was the motive for 68 killings. The maximum number of witchcraft cases were reported from Chhattisgarh (20), followed by Madhya Pradesh (18) and Telangana (11).

➲ Kerala saw two cases of human sacrifice. In 2020, India saw 88 deaths due to witchcraft and 11 died as part of 'human sacrifices'.

What are the laws in India?

➲ In India, there is no central law that exclusively deals with crimes related to witchcraft, superstition, or occult-inspired activities.

➲ In 2016, MP Raghav Lakhanpal introduced the Prevention of Witch-Hunting Bill in the Lok Sabha, but it wasn't passed. The draft provisions included punishment for accusing or identifying a woman as a witch, use of criminal force against a woman, or torture or humiliation on the pretext of performing witchcraft.

➲ The Indian Penal Code (IPC) also prescribes punishment for related crimes like abduction and murder, but not for harming others via furthering superstitious and outdated beliefs. In the absence of a nationwide legislation, a few States have enacted laws to counter witchcraft and protect women from deadly 'witch-hunting'.

Bihar (1999):

➲ Bihar was the first State to enact a law to prevent witchcraft, identification of a woman as a witch and "eliminate torture, humiliation and killing of women."

➲ The Prevention of Witch (Daain) Practices Act came into force in October 1999.

➲ The Act describes a witch as a "woman who has been identified as a witch by someone else, having the

power or intention of harming any person through the art of black magic, evil eyes, or "mantras" and it is deemed that she will cause harm to other people or the community in any manner.

➲ Anyone who identifies a person as a "witch" and acts to aid this identification can face a jail term of up to three months, or a fine of Rs 1,000, or both. In case of physical or mental torture, the jail term could be extended to six months, and the fine to Rs. 2,000. All offences under the Act are cognisable and non-bailable.

Jharkhand (2001):

➲ Jharkhand enacted a similar law in 2001, the Prevention of Witch (Daain) Practices Act. The law, however, hasn't been effective. A document on the Jharkhand Police website claims that the passage of the Act "has not adequately prevented the identification and murder of women labelled as witches."

➲ In 2021, Justice Sujit Narayan Prasad, the then Chief Justice of Jharkhand High Court, took suo moto cognizance of an incident where five of family in Gumla were killed after a village council sentenced them to death on the charge of being "witches".

➲ It is very unfortunate that the Prevention of Witch (Daain) Practices Act, 1999 has been in operation since the year 1999 and the same has been adopted by the State of Jharkhand but concrete steps have not been taken to achieve the object and intent of the Act, 1999, the Chief Justice said in the March 2021 order.

Chhattisgarh (2005):

➲ Chhattisgarh is one of the worst-affected States in terms of witchcraft-related crimes and targeted violence against women. A witch is called a "tonahi" in the State. In 2005 the State enacted the Chhattisgarh Tonahi Pratadna Nivaran Act 2005 along the lines of Bihar and Jharkhand.

➲ As per the law, a person convicted for identifying someone as a witch can be sentenced to up to three years of rigorous imprisonment with a fine. The jail term can extend up to five years if the victim is mentally or physically harassed.

➲ The law adds that when a fine is imposed, the court shall take into consideration the physical and mental damage caused to the victim including the cost of treatment.

Odisha (2013):

➲ Following the directions of the Odisha High Court to frame a law to deal with rising cases of witch-hunting in the State, the Odisha Prevention of Witch-Hunting Bill was passed by the Assembly in 2013.

➲ The law includes provisions of imprisonment up to seven years and a penalty for offenders. The bill also provides for apenalty for a witch doctor, or a person claiming to be a black magician.

➲ Earlier in 2022, the Odisha State Commission for Women (SCW) sought stringent provisions in the existing Act after finding them inadequate. The panel demanded both jail and pecuniary punishment for persons found involved in sorcery-related crimes.

Maharashtra (2013):

➲ The Maharashtra Prevention and Eradication of Human Sacrifice and other Inhuman, Evil and Aghori Practices and Black Magic Act, 2013 was passed after the murder of anti-superstition activist Dr. Narendra Dabholkar the same year. Dr. Dabholkar headed the anti-superstition outfit Maharashtra Andhashraddha Nirmoolan Samiti (MANS).

➲ It enlists provisions for the prevention and eradication of human sacrifice and other inhuman practices. Punishment under the act is imprisonment of not less than six months and up to seven years, with a fine of not less than Rs 5,000 and up to Rs 50,000.

Rajasthan (2015):

➲ The State enacted the Rajasthan Prevention of Witch-Hunting Act, 2015 to "provide for effective measures to tackle the menace of witch-hunting and prevent the practice of witchcraft." The law prohibits witch-hunting and practising witchcraft.

➲ The punishment for crimes mentioned in the Act goes up to a jail term of not less than one year and up to seven years with a fine of not less than Rs. 50,000.

➲ A person claiming to have supernatural or magical powers to control or cure a witch can be punished with rigorous imprisonment from one to three years, with a fine not less than Rs 10,000. A person who performs a ritual to free a woman from an evil spirit can face up to three years in prison.

➲ All those found involved in the unnatural death of a woman due to witch-hunting can be sent to jail for seven years, extendable to imprisonment for life. They may also be fined up to Rs 1 lakh.

Assam (2015):

➲ The Assam Witch Hunting (Prohibition, Prevention and Protection) Act, 2015, which received the President's assent in 2018, provides for the complete prohibition of witch hunting.

➲ Punishment under the law can go up to seven years with a fine which may extend to Rs 5 lakh. The Act also stipulates punishment for involving the community and lists the measures the police can take to protect people from witch-hunting.

Karnataka (2020):

➲ The Karnataka Prevention and Eradication of Inhuman Evil Practices and Black Magic Act, 2017 came into effect in January 2020.

➲ The law bans several practices related to black magic and superstition, like forcing a person to walk on fire at religious festivals and the practice of piercing rods from one side of the jaw to the other.

- The law states that a court can direct the police to issue the name of a person convicted under the Act in local newspapers. "Inhuman, evil practices and black magic and advertisement, practice, propagation or promotion of such activities in violation of the Act" is punishable with up to seven years of imprisonment and with a fine ranging from Rs 5,000 to Rs 50,000.

What about Kerala?

- The Elanthoor human sacrifice case is not the first such case in the State. While data confirm that multiple cases are reported every year, police records show that majority of incidents took place in the countryside.
- Most recently, a woman in Palakkad slit the throat of her six-year-old child with a kitchen knife as a 'sacrifice' to appease the Gods.

Draft laws:

- The first attempt to frame an anti-superstition law came around a decade ago when back-to-back killings rocked the State. The then Additional Director General of Police (Intelligence), A. Hemachandran, prepared a working draft of the Kerala Exploitation by Superstition (Prevention) Bill in 2014, which covered elements involved in invoking supernatural powers for "wrongful gratification" including those of a monetary or sexual nature.
- The Kerala Sasthra Sahithya Parishad (KSSP) also submitted a draft 'Superstitions and Evil Practices (Prevention and Eradication) Bill' in the same year.
- The following year, MLA K. Sivadasan Nair moved a calling attention motion against evil and inhuman practices involving children. Replying to him, the Kerala government informed the Assembly that a draft on the lines of the anti-superstition law in Maharashtra was being prepared.
- Veteran Congress leader and former MLA P. T. Thomas also moved a private bill against black magic in 2018. All draft legislations, however, failed to see the light of day.

2019 Draft law:

- In 2019, the Kerala Law Reforms Commission, headed by former Supreme Court judge K. T. Thomas, submitted a fresh draft for an anti-black magic law to the State government.
- The Kerala Prevention of Eradication of Inhuman Evil Practices, Sorcery and Black Magic Bill, 2019 proposed strict punishment for any kind of evil practice in the name of black magic — a fine of up to Rs 50,000 and imprisonment of up to seven years, besides the punishments for offences under the Indian Penal Code. The Bill proposed spreading awareness about evil practices and publishing names and details of convicts in newspapers.
- Like the 2014 Bill, the 2019 legislation also excluded harmless rituals performed at home and religious

places, festivals, prayers and processions and worship at any religious or spiritual place from its purview. But like its predecessors, the Bill was also in cold storage until October 2022.

What's next?

- In the aftermath of the Elanthoor killings, the Kerala government is likely to consider the Kerala Prevention and Eradication of Inhuman Evil Practices, Sorcery and Black Magic Bill, 2019.
- The government may either opt for an ordinance or a legislation on the floor of the Assembly to take the Bill forward.
- The finalisation of the Schedule of the Bill could, however, pose a serious challenge to the government, as the inclusion or exclusion of practices originating in could upset powerful socio-religious groups and civil society organisations in the State. At present, the draft Bill includes 10 practices deemed necessary to be curbed by the Law Commission.

NATIONAL CREDITS FRAMEWORK (NCRF)

Why in news?

- In a bid to integrate academic and vocational or skill-based education, Union Education Minister recently unveiled the draft report on the National Credits Framework (NCrF) and invited nationwide public consultations and suggestions on the proposed educational credits system.
- NCrF would be a game changer by opening numerous options for further progression of students and inter-mingling of school and higher education with vocational education and experiential learning, thus mainstreaming skilling and vocational education.

What is the National Credits Framework?

- Academic credits are a recognition that a student/ learner has completed a course or unit of learning that corresponds to a qualification at a given level. Credits quantify the outcomes of learning.
- In a credit-based education system, a stipulated amount of credits based either on the number of hours of learning or student workload are required to progress from one level to another, subject to assessments such as examinations. For instance,

20 credits are required to complete a semester along with passing exams.

◔ While there is currently no established credit mechanism for regular school education in India, there is a credit system under the open schooling system and a Choice Based Credit System (CBCS) for higher education.

◔ In order to "seamlessly integrate" the credits earned through school education, higher education and vocational & skill education, the Centre has drafted the National Credits Framework (NCrF) as an "inclusive umbrella Framework" under the National Education Policy (NEP) 2020.

◔ The Credits Framework also aims to democratise education by enabling learners to earn credits not just through academic education or classroom learning but through co-curriculars, extracurriculars, vocational learning, online or distance learning, recognition of prior learning, and informal learning.

◔ The draft document states that the total learning hours of the student could be creditised and no form of learning would remain unaccounted for; it may include:

  ➤ classroom teaching/ learning
  ➤ laboratory work/ innovation labs/ class projects/ assignments/ tutorials
  ➤ sports and games, yoga, physical activities
  ➤ performing arts, music, handicraft work
  ➤ social work, NCC, bag less days
  ➤ examinations/ class tests/ quizzes/ assessments
  ➤ vocational education, training and skilling
  ➤ minor/ major project work/ field visits in skill education
  ➤ on the job training (OJT)/ internship/ apprenticeship/ experiential learning including relevant experience and professional levels acquired

How will the integrated credits system work?

◔ The NCrF proposes the alignment of notional learning hours—the number of hours a student will spend to achieve a particular learning outcome across academic classes including preschool, school and higher education.

◔ It proposes that a learner, from class five to doctorate education, should spend 1200 notional learning hours every year in order to earn 40 credits, which, at the school level would mean 600 hours and 20 credits per semester. From preschool up to grade 5, the learning hours would range from 800 to 1000 hours.

◔ From grade 5 onwards, 30 notional learning hours would be counted as one credit. The learner would also be able to earn more than 40 credits in a year if they partake in any additional program/course beyond the prescribed 1200 learning hours or beyond the purview of the course syllabus.

◔ Based on the number of years of learning along with assessment, the NCrF prescribes eight credit levels in schooling till higher education.

◔ Under this framework, reaching grade 5 would mean the student is at credit level 1, grade 8 would be level 2, grade 10 level 3 and so on. Levels for three and four-year undergraduate courses would be 5.5 and 6 respectively, and the highest level or level 8 would be assigned upon obtaining a PhD.

◔ Notably, credits and credit levels will be assigned uniformly between different areas of learning, i.e. arts and sciences, vocational and academic streams, and curricular and extra-curricular.

Vocational education:

◔ As for vocational education, training, and skilling, while the credit levels, learning hours and credits earned in a year remain the same, the forms of learning that nets credits changes.

◔ For instance, at credit level 1 of vocational education, a learner without any formal education or prior experience would need to spend 150 to 210 hours in a short-term training programme [theory, practical, and on-the-job training (OTJ)] program or 600 hours in an apprenticeship program. At level 3, a learner would need to be either in grade 9 of formal education or have passed grade 8 with one year of experience in that skill.

◔ Similarly, assignment of credits has also been prescribed for other forms of learning such as online learning, open or distance learning, blended learning, and also for relevant work experience and proficiency in a vocational skill.

◔ The NCrF will encompass all the National Qualification Frameworks that determine qualification levels in skill-based, school, and Higher education- National Higher Education Qualification Framework (NHEQF), National Skills Qualification Framework (NSQF) and National School Education Qualification Framework (NSEQF).

What is the Academic Bank of Credits?

◔ All the credits earned by a learner through all the forms, streams, and levels of learning would be stored in the Academic Bank of Credits (ABC), which was introduced earlier in 2022 just for higher education purposes. The ABC would be a digital repository of all credits earned by a student.

◔ When introduced for higher education recently, the ABC was envisioned to enable the transfer of credits across higher education institutions. For instance, if a student pursuing a degree in one college wanted to pursue another elective or course simultaneously in another college, their credits would be universal.

◔ Since the ABC would be extended to all forms of learning, it would store credits earned from formal education, vocational education, distance or online

education, informal education, internships, and other credited activities, which would create a formal system of credit recognition, credit accumulation, credit transfer, and credit redemption in order to promote distributed and flexible teaching and learning. The credits stored in the ABC would also be useful to a learner who wants to exit the education ecosystem mid-course or degree and use the stored credits to re-enter later.

➲ The multiplication of credits earned with the NCrF credit level will provide the value of credit points a learner has, which can then be redeemed from the ABC while starting a course at any academic or vocational institute.

What is the importance of the NCrF?

➲ The NCrF aims to blur the lines or remove the "hard separation" between curricular, extracurricular, or co-curricular, among arts, commerce, and sciences, or between vocational or academic streams.

➲ The draft states that learning is a process that takes into account multiple dimensions of "cognitive, emotional, social and physical learning" and for holistic learning, students should be allowed to "choose subjects according to their interests irrespective of the nature of the course (academic or vocational)".

➲ For this purpose, it urges educational institutions or regulators to form new curricula that allow for actual choice-based multidisciplinary learning, where a student has the ability to design their own course structure. For example, a learner in the science stream has the option of taking multiple humanities electives or courses and earning an equal number of credits.

Way Forward:

➲ One of the main objectives of the NCrF is to bring skilling and vocational learning to the mainstream, by creating equivalence of a vocational education and skilling program with general education programs with or without any additional academic learning.

➲ There are occasions when learners pursue alternative schooling, home-schooling, or online schooling or have to give up their education mid-way for various reasons. The national credit framework will act as an enabler in this regard and regulators shall be required to define the entry and exit criteria of the programs being offered by them.

DOCTRINE OF PLEASURE

Context:

➲ Kerala Governor Arif Mohammed Khan and the State government have major differences over multiple issues. The latest controversy has arisen after he sought the resignation of several vice-chancellors following a Supreme Court judgment setting aside the appointment of the Vice-Chancellor of a technology university.

➲ As a fallout of comments made by the State's Finance Minister, the Governor has also sought his dismissal from his Cabinet, declaring that he has withdrawn the pleasure of having him in the Council of Ministers.

What is the concept of pleasure doctrine?

➲ The pleasure doctrine is a concept derived from English common law, under which the crown can dispense with the services of anyone in its employ at any time.

➲ In India, Article 310 of the Constitution says every person in the defence or civil service of the Union holds office during the pleasure of the President, and every member of the civil service in the States holds office during the pleasure of the Governor.

➲ However, Article 311 imposes restrictions on the removal of a civil servant. It provides for civil servants being given a reasonable opportunity for a hearing on the charges against them.

➲ There is also a provision to dispense with the inquiry if it is not practicable to hold one, or if it is not expedient to do so in the interest of national security.

➲ In practical terms, the pleasure of the President referred to here is that of the Union government, and the Governor's pleasure is that of the State government.

Can the Governor use it?

➲ Under Article 164, the Chief Minister is appointed by the Governor; and the other Ministers are appointed by the Governor on the CM's advice.

➲ It adds that Ministers hold office during the pleasure of the Governor.

➲ In a constitutional scheme in which they are appointed solely on the CM's advice, the 'pleasure' referred to is also taken to mean the right of the Chief Minister to dismiss a Minister, and not that of the Governor. In short, the Governor of an Indian State cannot remove a Minister on his own.

What did the Supreme Court say on one Vice-Chancellor's appointment?

➲ In a case challenging the appointment of Dr. M.S. Rajasree as V-C of the APJ Abdul Kalam Technological

University, Thiruvananthapuram, the Supreme Court held that her appointment was contrary to the regulations of the University Grants Commission (UGC).

- The particular infirmity was that the Search Committee had identified only one candidate and recommended the name to the Chancellor for appointment.
- Under UGC regulations, a panel of three to five names should be recommended so that the Chancellor has a number of options to choose from.
- The court rejected the State government's argument that it had not specifically adopted the UGC regulations, holding that the regulations framed under a Central law will override the State government's relevant rules.

How did the Governor react?

- The Governor, in his capacity as Chancellor of universities, responded by directing the V-Cs of nine universities to resign the very next day, contending that the infirmities pointed out by the Supreme Court in one case also vitiated their appointments.
- He noted that the apex court had declared that an appointment not in line with the UGC regulations would be ab initio void that is invalid from the very beginning.
- He highlighted the fact that each of those appointments were either made on the basis of a single recommendation or were recommended by a panel in which the Chief Secretary was a member (contrary to the Regulations that say its members should be persons of eminence in the field of higher education).
- However, when the communication was challenged in the Kerala High Court, the Governor converted his directive into show-cause notices to the V-Cs to explain how their appointments were not illegal. Later, such notices were sent to two more V-Cs.

INTERNATIONAL RELATION

IMPACT OF WAR IN UKRAINE ON ASIA'S CLIMATE GOALS

Context:

- The ongoing Russia-Ukraine conflict has a great potential to hamper the post-Covid economic recovery of the Asian/Southeast Asia region.
- The war in Ukraine will have far-reaching economic consequences on Asian economies as Russian energy is the major driver of the economic growth in the region.

Energy & Inflation crisis:

- Russia being the third largest petroleum producer in the world and Asia counting for 35% of global oil consumption, the supply chain disruptions due to economic sanctions on Russia are bound to drive the oil prices higher.
- All of the eight South Asian economies are net oil importers hence making them vulnerable to the oil shocks by making the cost of production more expensive thereby aggravating the prices of consumer goods.
- Rising oil prices have a direct relation with rising food prices, with food production being an energy-intensive sector.

Fading Climate goals:

- Most Asian countries are prioritizing energy security, sometimes over their climate goals
- Both Japan and South Korea, two of Asia's most developed countries, are pushing for nuclear energy after the Russian invasion of Ukraine.
- For the enormous energy needs of China and India it implies relying on dirty coal power in the short term. But for developing countries with already-strained finances, the war is having a disproportionate impact.

Sri Lanka:

- Sri Lanka is an extreme example of the predicament facing poor nations. Enormous debts prevent it from buying energy on credit, forcing it to ration fuel for key sectors with shortages anticipated for the next year.
- Sri Lanka set itself a target of getting 70% of all its energy from renewable energy by 2030 and aims to reach net zero, balancing the amount of greenhouse gas they emit with how much they take out of the atmosphere by 2050.
- Its twin needs of securing energy while reducing costs means it has "no other option" than to wean itself off fossil fuels. Thesetargets are more "aspirational than realistic" because the current electrical grid can't handle renewable energy.
- Grids that run on renewable energy need to be nimbler because, unlike fossil fuels, energy from wind or the sun fluctuates, potentially stressing transmission grids.

China:

- China, currently the top emitter of greenhouse gases in the world, aims to reach net zero by 2060, requiring significant slashing of emissions.

● But since the war, China has not only imported more fossil fuels from Russia but also boosted its own coal output. The war, combined with a severe drought and a domestic energy crisis, means the country is prioritizing keeping the lights on over cutting dirty fuel sources.

India:

● India aims to reach net zero a decade later than China and is third on the list of current global emitters, although their historical emissions are very low.

● No other country will see a bigger increase in energy demand than India in the coming years, and it is estimated that the nation will need $223 billion to meet its 2030 clean energy targets.

● Like China, India's looking to ramp up coal production to reduce dependence on expensive imports and is still in the market for Russian oil despite calls for sanctions.

Renewable energy in India & China:

● But the size of future demand also means that neither country has a choice but to also boost their clean energy.

● China is leading the way on renewable energy and moving away from fossil fuel dependence.

● India is also investing heavily in renewable energy and has committed to producing 50% of its power from clean energy sources by 2030.

● More domestic production doesn't mean that the two countries are burning more coal, but instead substituting expensive imported coal with cheap homegrown energy.

Japan & South Korea:

● Both Japan and South Korea are pushing for nuclear energy after the Russian invasion of Ukraine.

● Sanctions against Russian coal and gas imports resulted in Japan looking for alternative energy sources despite anti-nuclear sentiments dating back to the 2011 Fukushima disaster. An earlier-than-expected summer resulted in power shortages, and the government announced plans to speed up regulatory safety checks to get more reactors running.

● Japan aims to limit nuclear energy to less than a quarter of its energy mix, a goal seen as overly optimistic, but the recent push indicates that nuclear may play a larger role in the country.

● Neighboring South Korea hasn't seen short-term impacts on energy supplies since it gets gas from countries like Qatar and Australia and its oil from the Middle East. But there may be an indirect hit from European efforts to secure energy from those same sources, driving up prices.

● Like Japan, South Korea's new government has promoted nuclear-generated electricity and has indicated reluctance to sharply reduce the country's coal and gas dependence since it wants to boost the economy.

Indonesia:

● The war, and consequent rising gas prices, forced Indonesia to reduce ballooning subsidies aimed at keeping fuel prices and some power tariffs in check.

● Coal exports have increased nearly 1.5 times between April and June, compared to 2021, in response to European demand and Indonesia has already produced over 80% of the total coal it produced last year.

● The country needs to nearly triple its clean energy investment by 2030 to achieve net zero by 2060, according to the International Energy Agency, but it wasn't clear how it was going to meet those targets.

INDIA ABSTAINS FROM UN VOTE ON UIGHUR MUSLIMS IN UNHRC

Why in news?

● Recently, the efforts of the US and Western countries to bring a resolution against China on the situation of Uighur Muslims in the United Nations Human Rights Council (UNHRC) suffered a setback when 11 countries, including India and Ukraine, indirectly helped China by being absent at the time of voting.

● The failure of this resolution in the 47-member UN council is being considered a major setback for America and the entire Western lobby.

Details:

● Human rights groups have been sounding the alarm over what is happening in the in the Xinjiang Uyghur Autonomous Region of China for years, alleging that more than one million Uyghurs had been detained against their will in a large network of what China calls 're-education camps'.

● The draft resolution was presented by a core group consisting of Canada, Denmark, Finland, Iceland, Norway, Sweden, UK and USA, and co-sponsored by a range of states, including Turkey.

● Serious allegations of human rights violations against Uyghurs and other predominantly Muslim communities in China were brought to the attention of the UN Human Rights Office and UN human rights mechanisms since late 2017.

US proposal rejected at UN:

➲ This is only the second time in the UNHRC's 16-year history that a US resolution has been rejected. It also explains the changing global equations.

➲ Most of the discussion after the UNHRC vote is about India's stand. Given the current state of relations with China, the US expected support from India. However, India said that it has stuck to its policy of not voting against any country in institutions like the UNHRC.

➲ However, it is believed that India has taken this step due to the apprehension of a UN vote on Jammu and Kashmir in future.

Recent India-China equation:

➲ An agreement has also been reached recently to resolve the ongoing military dispute between the two countries on the Line of Actual Control (LAC) in eastern Ladakh of India from May, 2020 and the withdrawal of troops.

➲ However, during this period, China has also thwarted India's efforts to ban terrorists hiding in Pakistan by using its veto power in the UN Security Council (UNSC).

India challenges US in global diplomacy:

➲ The motion brought by US, Britain and Canada at the UN got 17 votes in favor and 19 against while 11 countries did not take part in the UNHRC vote.

➲ Voting at the UNHRC also marks a change in global diplomacy. India, a close partner of the US, has not only been absent, Ukraine has also been absent from voting.

➲ The US, Britain and Canada are currently engaged in helping Ukraine against Russia. This proposal was brought to draw world attention to the situation of Muslims in China, but Pakistan, Indonesia, Qatar, UAE, Uzbekistan, Sudan, Senegal opposed it.

About UNHRC:

➲ It was created by the United Nations General Assembly in 2006. It replaced the former United Nations Commission on Human Rights.

➲ It is made up of 47 United Nations Member States which are elected by the UN General Assembly (UNGA).

➲ The Office of the High Commissioner for Human Rights (OHCHR) serves as the Secretariat of the Human Rights Council. OHCHR is headquartered in Geneva, Switzerland.

THE COALITION OF THE WORLD

Context:

➲ The League of Nations, set up in 1920, was the first intergovernmental organisation with the aim to promote international cooperation and outlived its utility with World War II.

➲ The United Nations claims to be the one place where all the world's nations can discuss common problems and find shared solutions that benefit all of humanity.

Reforms:

➲ Now, 75 years later, rising conflict situations suggest it is time to go back to first principles of the Charter.

➲ India's Presidency of the Group of 20, UN Security Council (UNSC) in 2022, and the Shanghai Cooperation Organisation (SCO) in 2023 when major powers are not even talking to each other and India alone, now the fifth largest economy, is interacting with each of them, presents a historic opportunity.

Challenges before UN:

Multilateralism:

➲ First, multilateralism is under challenge even by its proponent, with the United States opting for partnerships, with the most important areas being the worst affected.

➲ The G7 Summit, held in June, endorsed the goals of a cooperative international Climate Club to accelerate climate action outside the UN. The dispute settlement mechanism of the WTO without the quorum of its members has rendered the institution dysfunctional.

➲ Despite the G7 having accepted the need for transfer of funds at Rio in 1992, because of their role in creating the climate crisis, the promise made in 2009 to provide at least $100 billion per year in climate finance remains unfulfilled.

Rival multilateral institutions:

➲ Second, China has opted for rival set of multilateral institutions. China's Belt and Road Initiative (BRI) seeks to achieve policy, infrastructure, trade, financial, and people-to-people connectivity by building a new platform for international cooperation to create "new drivers of shared development", and covers half the world population with one-third the GDP and investment of $930 billion.

➲ China's Global Development Initiative, 2021, and linked Global Security Initiative, 2022, is developing a conceptual frame responding to an urbanising world, i.e. digital governance and non-traditional security, which the international system has not covered.

Rising conflicts:

➲ Third, more significant than the clash of institutions reflecting the deepening divide between the Atlantic powers and the Russia-China combine is the diffusion of wealth, technology and power.

➲ The 'rest', despite threats, are now capable of not taking sides and are looking for leadership within the United Nations, for what the UNSG characterised as "coalition of the world".

Future Roadmap:

➲ Strategists in major powers see the world in binary terms around rules. In a multipolar world, the question is the kind of rules needed for human wellbeing and whether principles would serve the purpose better.

➲ Second, the time is ripe for a 'big idea' that both keeps away from the current multilateral focus on global rules, amount of aid and inviolability of IPR's as well as recognises a role for competing institutions as countries can now secure the best terms themselves without bargaining.

➲ Third, just as the 'Rio principles' continue to guide climate change, vasudhaiva kutumbakam, or 'world as one family', focusing on comparable levels of wellbeing can be the core of a set of universal socio-economic principles for a dialogue between the states.

➲ Fourth, to the current global consensus around equitable sustainable development, Prime Minister Narendra Modi has added a clearer societal purpose to flesh out a universal civilisational principle.

➲ He emphasised 'Lifestyle for Environment' seeing climate change as a societal process and combating it devoid of trade-offs characteristic of the Climate Treaty. He has also offered India's payments and linked digital ID technology without IPR restrictions.

➲ Fifth, redefining 'common concerns' in terms of felt needs of the majority rather than interests and concerns of the powerful will shift the focus of a much slimmed down United Nations squarely to human wellbeing, and not as an add-on.

Way Forward:

➲ India's Presidential statement could introduce 'vasudhaiva kutumbakam' in the UNSC in December. The SCO Summit will precede the G20 Summit and acceptance of overarching principles will support acceptance by the wider G20.

RUSSIA'S ALTERNATIVE TO NORD STREAM 2, A GAS PIPELINE TO CHINA

Why in news?

➲ Russia's Energy Minister earlier in 2022 confirmed plans to will replace the damaged Nord Stream 2 gas link to Europe with its Asian project with China.

➲ Now, China and Russia are nearing the completion of a new pipeline that would send gas from Siberia to Shanghai. The pipeline on the Russian side is called Sila Sibiri or the Power of Siberia.

Sila Sibiri pipeline:

➲ This new pipeline (3,000 km long) will connect East Siberia to Shanghai in Eastern China. The initial test flows will begin on October 25 with the flows being used to pressure test the pipeline connectors.

➲ The pipeline goes along the eastern edge of China, via the capital city of Beijing, and all the way to Shanghai.

➲ The middle phase began operations in December 2020, while the final southern part is scheduled to begin gas delivery in 2025.

Background:

➲ Russia began supplying natural gas to China in December 2019, as part of a $400 billion contract struck in 2014 by Russian gas giant Gazprom and China National Petroleum Corp. This contract was signed for a period of 30 years.

➲ By 2021, Russia had already supplied 10 billion cubic meters worth of natural gas to China. These gas supplies from Russia had been used in Northeast China's Heilongjiang Province, Beijing, and Tianjin.

How it is a small way out for Russia?

➲ While Gazprom and the China National Petroleum Corp. have been partnering since 2014, no one would have prophesied the significance of the line in 2022.

➲ Today, Russia is at risk of losing natural gas delivery contracts from the EU (European Union) and the associate countries over the annexation of Ukraine. This may impact 2/3rds of its total gas purchases.

➲ On the other hand, China has been having a hard look at sourcing its energy resources from multiple channels and providers.

➲ While the gas supplies have been going on since 2019, the volume has only now accelerated, post the Russian war on Ukraine. This looks to be a very gamed strategy by China to leverage Russia's weaknesses.

➲ China also has the option of importing natural gas from another supplier, Turkmenistan which supplies a higher volume to China.

Sila Sibiri 2:

➲ China and Russia have also been in discussions to build another pipeline that will probably run through Mongolia further reducing the overall cost and time of transportation of natural gas.

➲ While the Power of Siberia 1 line runs until Vladivostok of Russia (East of China), the new line can bisect the overall region by running through Mongolia.

➲ The new dedicated line will start from the Yamal-Nenets region via Mongolia to China and can handle

transportation of up to 50 Bcm per annum of gas and will be called Sila Sibiri 2 or Power of Siberia 2.

⮞ If everything goes well, the construction activities may start at the end of 2024 or early 2025 and may only be completed by 2030.

Nord Stream 2:

⮞ The Nord Stream 2 was a new export gas pipeline planned to run from Russia to Europe across the Baltic Sea.

⮞ The decision to build Nord Steam 2 was based on the successful experience in building and operating the Nord Stream gas pipeline.

New payment mechanism:

⮞ Gazprom and the China National Petroleum Corp have also agreed to pay each other in Rubles and Yuan as part of the policy to reduce their dependence on the US Dollar and the Euro.

⮞ The new payment mechanism is a mutually beneficial, timely, reliable and practical solution.

Is China re-exporting Russian Gas to EU?

⮞ Europe's gas storage is currently about 80% filled, due in part to Chinese LNG exports. As per the export data of China, Chinese LNG companies have substantially increased their gas exports in 2022 due to the vacuum created by the absence of Russian imports in the EU.

⮞ Reports indicate that 7% of the EUs gas consumption has been met by Chinese imports. This has brought about a question as to if China is reexporting Russian gas to the EU.

⮞ If things do continue this way, Russia may send more gas supplies to China owing to China getting more gas export requests from the EU. In the end, Russia may somewhat offset their lack of orders to an extent and China could greatly profit by reselling Russian gas supplies.

⮞ Russia needs to be patient as China cannot ever be a partner as large as Russia for the EU to provide its energy supplies. The EU also has other partners that will try to fill the void, namely, Norway, Turkmenistan, Qatar, Israel and maybe even Iran in the future.

IS JERUSALEM RECOGNISED AS THE CAPITAL OF ISRAEL?

Why in news?

⮞ Recently, Australia revoked its recognition of West Jerusalem as the capital of Israel.

⮞ Former Prime Minister Scott Morrison had formally recognised West Jerusalem as Israel's capital in December 2018 following a similar move by then-U.S. President, although Australia's embassy remained in Tel Aviv.

⮞ Israel considers "complete and united" Jerusalem as its capital. Palestinian officials are of the view that East Jerusalem should be the capital of the future State of Palestine.

What prompted the move?

⮞ Australia said that it remains committed to a two-State solution in which "Israel and a future Palestinian state coexist, in peace and security, within internationally recognised borders". Australia's Foreign Ministry said that it will not support an approach that undermines this prospect.

⮞ The Ministry also guaranteed its support to both Israel and Palestine. It was among the first countries to formally recognise Israel under Labour Prime Minister Ben Chifley. This government will not waver in its support of Israel and the Jewish community in Australia.

⮞ The move was criticised by Israeli Prime Minister.

⮞ Palestine welcomed the move by Australia as an "affirmation" that Jerusalem's status depends on the final status of talks.

What is the two-State solution?

⮞ The internationally-accepted resolution of the Israel-Palestine conflict is called the two-State solution.

⮞ If achieved, the two-State solution will provide for the coexistence of the State of Israel alongside the independent State of Palestine.

How is Indonesia involved?

⮞ Indonesia is the world's most populous Muslim nation and Australia's immediate neighbour. Australia's earlier announcement of the possible recognition of West Jerusalem as Israel's capital in October 2018 angered Indonesia.

⮞ Due to the ensuing tension, Australia warned its citizens to "exercise a high degree of caution" while travelling to Indonesia due to protests in the capital Jakarta and popular holiday hotspots, including Bali.

⮞ The move to revoke the recognition of West Jerusalem as the capital of Israel has been welcomed by Indonesia.

Do other countries recognise West Jerusalem as the capital of Israel?

➲ Most countries still have their embassies in Tel Aviv and not Jerusalem. Before 1980, many embassies were located in Jerusalem.

➲ However, U.N. Security Council Resolution 478 urged countries to move their diplomatic missions out of Jerusalem, and 10 countries – Bolivia, Colombia, Costa Rica, Dominican Republic, El Salvador, Guatemala, Haiti, the Netherlands, Panama, and Uruguay – complied. Chile, Ecuador, and Venezuela had already withdrawn their missions prior to the adoption of the resolution.

➲ Costa Rica and El Salvador were the last countries to move their embassies out of Jerusalem in 2006.

United States:

➲ In December 2017, U.S. President announced the recognition of West Jerusalem as the capital of Israel and said that the embassy would be moved there. The U.S. embassy in Jerusalem opened in May 2018.

➲ The move, however, was not brand new for the U.S. In 1995, the U.S. Congress passed the Jerusalem Embassy Act to move its embassy from Tel Aviv to Jerusalem.

➲ The Act was legally binding; however, a clause allowed Presidents to postpone its application for six months for "national security interests". Bill Clinton, George W. Bush and Barack Obama re-ratified the clause every six months during their tenure as U.S. Presidents.

Other nations:

➲ Guatemala followed suit and opened an embassy in Israel two days after the U.S. Paraguay also said that it would move its embassy to Jerusalem but the decision was reversed in just three months when a new government was elected.

➲ In June 2021, Honduras inaugurated its embassy in Jerusalem. However, a year later, the country's foreign ministry said that it was considering moving the embassy back to Tel Aviv.

➲ Kosovo opened an embassy in Jerusalem in March 2021., while Suriname announced in May 2022 that it plans to open an embassy in the city, although a definite date was not set.

➲ In September 2022, there was news of then-U.K. Prime Minister Liz Truss considering moving the country's embassy from Tel Aviv to Jerusalem and had discussed the same with Israeli Prime Minister in a meeting on the sidelines of the U.N. General Assembly in New York.

TURKEY'S LATEST 'DISINFORMATION' LAW

Why in news?

➲ Recently, Turkey's parliament adopted the much-critiqued 'disinformation law' that accords jail terms of up to three years to social media users and journalists for spreading 'disinformation'.

Widespread criticism:

➲ The bill that has drawn concerns about potential curtailment of social media and journalistic freedom in the country especially in lieu of the upcoming presidential and parliamentary polls in 2023.

➲ The development assumes significance especially with surveys reflecting support for the incumbent President and his party tumbling since the last vote. The bill now awaits the final approval of the President.

What does the law entail?

➲ Cumulatively known as 'the disinformation law', it comprises about 40 articles that would amend about 23 different laws.

➲ Of the 40, the most contentious is Article 29. It designates it an offence to publicly disseminate misleading information about the country's internal and external security, public order and general well-being for the purpose of causing fear or panic among the populace.

➲ The Turkish government has argued that the law would combat cases where the internet is used to share illegal content under false names and where anonymous accounts slander and defame individuals of differing political thought, religion or ethnicity.

➲ The article introduces a jail term between one and three years for any violation with the extension of an additional half of the initially stipulated term if the actions are done in anonymity.

What it holds for social media platforms?

➲ To implement this law, social media platforms could now be asked to hand over user data to Turkish courts.

➲ This is an extension of the law passed in 2020 that required social media intermediaries to remove or render inaccessible certain flagged content on their platforms.

➲ Failure would lead to losing 90% of bandwidth reserved for the platform, effectively implying, being rendered inoperable in Turkey.

What are the concerns?

➲ Critics, including the Venice Commission which is the advisory body to the Council of Europe on constitutional matters, have pointed to the unclear

interpretation of certain crucial terminologies, especially 'disinformation'.

- The legislation accords the responsibility of determining the same to prosecutors. Critics here argue that Turkey being a heavily polarised country and the courts having previously turned against journalists and other social-scientists does not lend a confident picture.

- The Commission also highlighted concerns on assertions about what should constitute disturbance to 'public peace'. Following the meeting with the authorities, what seems to be the most alarming is that a public protest may be considered in itself a disturbance of public peace.

- This also triggers questions on 'dissemination' of the alleged 'disinformation' especially when the boundaries between physical and online spaces are blurred.

- Thus, the legislation lacks clarity on how the entity shall be deemed guilty, that is, for sharing or manufacturing the information (especially in an offline space). It is for the above-mentioned reasons that a jail term appears to be a stretched penal provision.

- The Venice Commission states that interference is necessitated when there is a "pressing social need" and must be "proportionate to the legitimate aim pursued", in other words, the means must meet the specified ends. It is only under certain exceptional circumstances that the state can opt to restrict expression.

Why are journalists concerned?

- The law would now recognise news websites as part of mainstream media and they would thus have to comply with the same regulations as those for newspapers.

- This would imply that websites will be legally required to publish a refutation to a certain news piece as newspapers, another common tool for censorship. For example, say a digital news outlet publishes a piece on corruption which is flagged by the regulatory authority at a later point, not only would it have to be taken down but a refutation should be published on the same hyperlink.

- Adding to the concerns are the Turkish government's disdain for anonymity, a tool frequently used by journalists to conceal their sources. The investigative journalism "would practically be impossible".

- Turkey already has an unimpressive record pertaining to press freedom. It ranks 149 out of 180 in the Press Freedom Index (2022).

- Additionally, as per a report of the Journalists' Union of Turkey, more than 270 journalists were put on trial in 2021, while 57 others were physically assaulted and 54 news websites and 1,355 articles were blocked.

Why is the backdrop of elections important?

- In a nutshell, it is argued that the new law could potentially prevent a pushback against government claims and thus, potentially emerge as the premise to silence the opposition campaigns in the run-up to the 2023 elections and restrict "the already-narrow space for public debate".

- The idea is to exert control over social media which has been a relatively open forum for independent journalism and debate.

- Another crucial aspect pointed out by the Venice Commission holds that judgments in these cases cannot be potentially expected earlier than the elections. Thus, a further hold on the information being made available to the public.

GILGIT-BALTISTAN'S SIGNIFICANCE FOR INDIA

Why in news?

- Recently, the Defence Minister said that the government has started its development journey in the Union Territories of Jammu and Kashmir and Ladakh and its northward journey will be complete after reaching "the remaining parts (of Pakistan occupied Kashmir), Gilgit and Baltistan".

- He said this would "implement the resolution passed unanimously by India's Parliament" on 22 February 1994 while speaking at the Shaurya Diwas celebrations on the outskirts of Srinagar.

What is Gilgit-Baltistan?

- Parts of Kashmir have been illegally occupied by Pakistan since 1947.

- Pakistan-occupied Kashmir (PoK) comprises two different regions, one which the neighbouring nation calls 'Azad Jammu and Kashmir' (AJK) and the other is Gilgit-Baltistan (GB).

- GB is the northernmost tip of Kashmir and covers part of Ladakh. It provides a land route with China, meeting Xinjiang Autonomous Region.

- To its south is the other part of PoK; to the east is Jammu and Kashmir and Afghanistan is to its west. The GB region makes up 86 per cent of PoK.

How did Pakistan occupy the region?

- Gilgit was part of the princely state of Jammu and Kashmir and in 1935, Hari Singh, the ruler of the state,

leased it to the British. After Independence, they decided to return Gilgit to the maharaja.

- On October 22, 1947, tribal militias backed by Pakistan poured into the valley and marched towards Srinagar, in accordance with Operation Gulmarg.

- Hari Singh, the Hindu-ruler of the princely state then sought assistance from India and signed the Instrument of Accession on 26 October, making Jammu and Kashmir a part of India, following which the Indian Army landed in the valley to push back the Pakistani invaders.

- In Gilgit, meanwhile, a rebellion broke out against Hari Singh. On November 1, a local political outfit called Revolutionary Council of Gilgit-Baltistan proclaimed the independent state. In just a span of two weeks, the group announced its accession with Pakistan.

- After the British returned Gilgit to Hari Singh in 1947, the ruler sent his representative Brigadier Ghansar Singh, as Governor. However, Gilgit Scouts, who were led by British Major William Alexander Brown rebelled. The officer illegally offered the region to Pakistan, who occupied it on November 4, 1947.

- In 1949, Pakistan entered into an agreement with the 'provisional government' of Azad Jammu & Kashmir (AJK), to take over its affairs. Under that agreement, the AJK government also ceded the Gilgit-Baltistan administration to Pakistan.

- Pakistan named the region, Gilgit Wazarat and Gilgit Agency, as The Northern Areas of Pakistan and it is directly administered by the country's government.

What do the people of G-B want?

- While the residents of the region expressed a desire to join Pakistan after gaining Independence, the neighbouring country did not merge the region, citing its territorial link to Jammu and Kashmir.

- The people of G-B have been demanding merger for years, so that they could enjoy the same Constitutional rights that Pakistanis have.

What is the 1994 resolution passed by India?

- The resolution on PoK underlined the Indian government's consistent and principled position and was adopted unanimously by both Houses of Parliament on 22 February 1994.

- The resolution states that "the entire Union Territories of Jammu & Kashmir and Ladakh have been, are and shall be an integral part of India". It demanded Pakistan vacate its illegally occupied territories in the region.

- On 4 April 2018, the United Kingdom Parliament said that Gilgit-Baltistan belongs to India as an integral part of Jammu and Kashmir after it legally acceded to the Union in 1947.

- The motion reads, "Gilgit-Baltistan is a legal and constitutional part of the state of Jammu and Kashmir, India, which is illegally occupied by Pakistan since 1947, and where people are denied their fundamental rights including the right of freedom of expression."

- In November 2019, when a new map of India showed the area as part of the newly created Union Territory of Ladakh, both Pakistan and China objected to it.

What's the status of the region now?

- In 2009, Pakistan passed the Gilgit-Baltistan (Empowerment and Self-Governance) Order, granting the region a Legislative Assembly and chief minister. A governor would be appointed by the president. Until then the region was called Northern Areas and ruled by the executive.

- However, in 2018 then-Pakistan Muslim League (N) government passed an order to limit the powers of the Assembly. This was done so that it would have greater control of the region and other resources for the infrastructure projects being planned under the China-Pakistan Economic Corridor (CPEC), according to a report in The Indian Express.

- In 2019, the Pakistan Supreme Court repealed the order, instructing the Imran Khan-led government to bring in governance reforms. However, this was not done. The top court appointed a caretaker government until the next Legislative Assembly elections.

- In November 2020, Imran Khan said that the region would be given a "provisional provincial status". But this also has not happened yet.

Why is Gilgit-Baltistan important to India?

- India has always maintained that this region belongs to it. However, its strategic importance has only increased with the China-Pakistan Economic Corridor, a collection of infrastructure projects in the Muslim-majority nation.

- As part of its Belt and Road Initiative, China has put a huge investment in the area. With tensions between India and China in Eastern Ladakh, India is worried about a two-front conflict.

- India has been emphasising taking control of the region. On 11 March 2020, the government said, "consistent and principled position, as also enunciated in the Parliament resolution adopted unanimously by both Houses on 22 February 1994, is that the entire Union Territories of Jammu & Kashmir and Ladakh have been, are and shall be an integral part of India".

- It said that the government "monitors all developments taking place in the territories of India including in territories that are under the illegal and forcible occupation of Pakistan".

ECONOMY

TOKENISATION FOR CARD TRANSACTIONS

Why in news?

- The Reserve Bank of India's launched card-on-file (CoF) tokenisation norms from October 1, which aim at improved safety and security of card transactions.

Tokenization
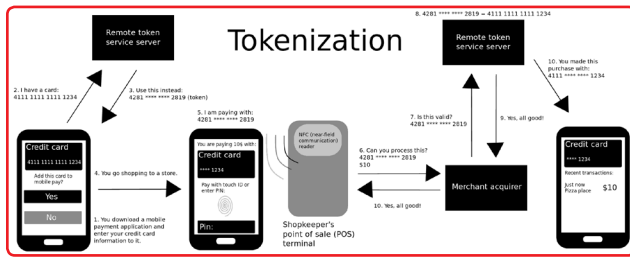
⮞ Now, for any purchases done online or through mobile apps, merchants, payment aggregators and payment gateways will not be able to save crucial customer credit and debit card details such as three-digit CVV and expiry date.

What is tokenisation?

⮞ Tokenisation refers to the replacement of actual card details with a unique alternate code called the 'token', which shall be unique for a combination of card, token requester, (i.e. the entity which accepts requests from the customer for tokenisation of a card and passes it on to the card network to issue a corresponding token) and the device.

How did India decide to carry out tokenisation?

⮞ In September 2021, the RBI prohibited merchants from storing customer card details on their servers with effect from January 1, 2022, and mandated the adoption of card-on-file (CoF) tokenisation as an alternative.

⮞ Following a series of representations from several industry players and digital payment platforms who anticipated disruption in online transactions from January 1, 2022, the RBI extended the implementation date of card-on-file (CoF) tokenisation norms by another six months to June 30, 2022. Subsequently, the deadline was extended till September 30, 2022.

But how will tokenisation work?

⮞ A debit or credit card holder can get the card tokenised by initiating a request on the app provided by the token requester.

⮞ The token requester will forward the request to the card network which, with the consent of the card issuer, will issue a token corresponding to the combination of the card, the token requester, and the device.

⮞ The customer will not be charged for availing the tokenisation service.

⮞ Earlier, the facility for card tokenisation was available only for mobile phones and tablets of interested card holders. Subsequently, with an uptick in tokenisation volume, the RBI decided to extend the scope of tokenisation to include consumer devices – laptops, desktops, wearables (wrist watches, bands, etc.) and Internet of Things (IoT) devices.

Who can offer tokenisation services?

⮞ Tokenisation can be performed only by the authorised card network and recovery of original Primary

Account Number (PAN) should be feasible for the authorised card network only.

⮞ Adequate safeguards have to be put in place to ensure that PAN cannot be found out from the token and vice versa, by anyone except the card network.

⮞ RBI has emphasised that the integrity of the token generation process has to be ensured at all times.

What do customers gain from tokenisation?

⮞ A tokenised card transaction is considered safer as the actual card details are not shared with the merchant during transaction processing. Actual card data, token and other relevant details are stored in a secure mode by the authorised card networks.

⮞ The token requestor cannot store Primary Account Number (PAN), or any other card details.

⮞ Card networks are also mandated to get the token requester certified for safety and security that conform to international best practices/globally accepted standards.

INDIA EMERGES AS THE WORLD'S LARGEST PRODUCER AND CONSUMER OF SUGAR

India is now the world's leading producer and consumer of sugar, as well as the world's second largest exporter.
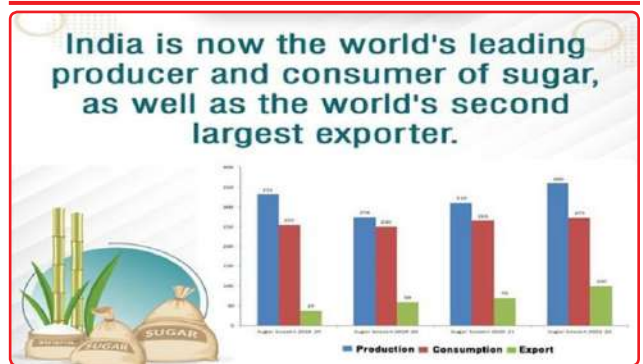
Why in news?

⮞ India has emerged as the world's largest producer and consumer of sugar as well as the world's 2nd largest exporter of sugar.

Details:

⮞ In Sugar Season (Oct-Sep) 2021-22, a record of more than 5000 Lakh Metric Tons (LMT) sugarcane was produced in the country out of which about 3574 LMT of sugarcane was crushed by sugar mills to produce about 394 LMT of sugar (Sucrose).

⮞ Out of this, 35 LMT sugar was diverted to ethanol production and 359 LMT sugar was produced by sugar mills.

2021-2022 boon for Indian Sugar Sector:

⮞ All records of sugarcane production, sugar production, sugar exports, cane procured, cane dues paid and ethanol production were made during the season.

⮞ Another shining highlight of the season is the highest exports of about 109.8 LMT that too with no financial assistance which was being extended upto 2020-21.

⮩ Supportive international prices and Indian Government Policy led to this feat of Indian Sugar Industry. These exports earned foreign currency of about ₹ 40,000 crores for the country.

Collaborative effort:

⮩ The success story of sugar industry is the outcome of synchronous and collaborative efforts of Central and State Governments, farmers, sugar mills, ethanol distilleries with very supportive overall ecosystem for business in the country.

⮩ Timely Government interventions since last 5 years have been crucial in building the sugar sector step by step from taking them out of financial distress in 2018-19 to the stage of self-sufficiency in 2021-22.

Ethanol production:

⮩ Growth of ethanol as biofuel sector in last 5 years has amply supported the sugar sector as use of sugar to ethanol has led to better financial positions of sugar mills due to faster payments, reduced working capital requirements and less blockage of funds due to less surplus sugar with mills.

⮩ During 2021-22, revenue of about ₹ 18,000 crore has been made by sugar mills/distilleries from sale of ethanol which has also played its role in early clearance of cane dues of farmers.

⮩ Ethanol production capacity of molasses/sugar-based distilleries has increased to 605 crore litres per annum and the progress is still continuing to meet targets of 20% blending by 2025 under Ethanol Blending with Petrol (EBP) Programme.

⮩ In new season, the diversion of sugar to ethanol is expected to increase from 35 LMT to 50 LMT which would generate revenue for sugar mills amounting to about ₹ 25,000 crores.

Way Forward:

⮩ The diversion of sugar to ethanol and exports led to unlocking of value chain of the whole industry as well as improved financial conditions of sugar mills leading to more optional mills in ensuing season.

THE INSOLVENCY AND BANKRUPTCY CODE (IBC)

Context:

⮩ October 1 marked the sixth anniversary of the Insolvency and Bankruptcy Board of India (IBBI).

What is the Insolvency and Bankruptcy Code (IBC)?

⮩ In a growing economy like India, a healthy credit flow and generation of new capital are essential, and when a company or business turns insolvent or "sick", it begins to default on its loans. In order for credit to not get stuck in the system or turn into bad loans, it is important that banks or creditors are able to recover as much as possible from the defaulter and as quickly as they can.

⮩ In 2016, at a time when India's Non-Performing Assets and debt defaults were piling up, and older loan recovery mechanisms such as the Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act (SARFAESI), Lok Adalats, and Debt Recovery Tribunals were seen to be performing badly, the Insolvency and Bankruptcy Code (IBC) code was introduced to overhaul the corporate distress resolution regime in India and consolidate previously available laws to create a time-bound mechanism with a creditor-in-control model as opposed to the debtor-in-possession system.

⮩ When insolvency is triggered under the IBC, there can be two outcomes: resolution or liquidation; all attempts are made to resolve the insolvency by either coming up with a restructuring or new ownership plan and if resolution attempts fail, the company's assets are liquidated.

What is the process followed under the IBC?

⮩ When a corporate debtor (CD), or a company which has taken loans to run its business, defaults on its loan repayment, either the creditor or the debtor can apply for the initiation of a Corporate Insolvency Resolution Process (CIRP) under Section 6 of the IBC.

⮩ Earlier, the minimum amount of default after which the creditor or debtor could apply for insolvency was ₹1 lakh, but considering the stress on companies amid the pandemic, the government increase the minimum amount to ₹1 crore.

Adjudicating Authority (AA):

⮩ To apply for insolvency, one has to approach a stipulated adjudicating authority (AA) under the IBC; the various benches of the National Company Law Tribunal (NCLT) across India are the designated AAs.

⮩ The Tribunal has 14 days to admit or reject the application or has to provide a reason if the admission is delayed. The CIRP or resolution process begins once an application is admitted by the AA. The amended mandatory deadline for the completion of the resolution process is 330 days.

⮩ Once the application is admitted, the AA appoints an interim resolution professional (IRP), registered with an insolvency professional agency (IPA). IRPs could be experienced and registered chartered accountants, company secretaries, lawyers and so on.

➲ Once appointed by the Tribunal, the IRP takes control of the defaulter's assets and operations, collects information about the state of the company from Information Utilities (repositories keeping track of the debtor's credit history), and finally coordinates the constitution of a Committee of Creditors or a CoC.

Committee of Creditors (CoC):

➲ A CoC, comprising all (unrelated) financial creditors of a defaulting company, is the most important business decision-making body in every CIRP, as it decides whether the defaulting company is viable enough to be restructured and given a fresh start, or liquidated.

➲ It also appoints an insolvency professional (IP), who can either be the same as the IRP or a new professional, who looks after the operations of the company during the CIRP.

➲ The IP invites and examines proposals for a resolution plan for a company, which could include restructuring of debt, merger or demerger of the company. It submits eligible plans to the CoC, which can approve a plan if it receives 66% of the voting share of committee members. If the CoC fails to approve any resolution plan, the company goes for liquidation.

➲ If a plan is approved, the CoC submits it to the Tribunal (before the maximum 330-day deadline), which then approves the plan which the debtor is bound to implement. The AA can also reject a plan.

Pre-pack insolvency resolution process (PIRP):

➲ In July 2022, the IBC was amended to introduce pre-packs or pre-pack insolvency resolution process (PIRP) for Micro, Small, and Medium Enterprises (MSMEs).

➲ Under a pre-pack resolution, creditors and owners of a business agree out-of-court to sell the business to an interested buyer. The buyer may be a third party or someone related to the business.

➲ The current law limits the pre-pack resolution mechanism to defaults not exceeding Rs. 1 crore

What are the challenges for the IBC?

➲ According to its regulator, the Insolvency and Bankruptcy Board of India (IBBI), the first objective of the IBC is resolution, a way to save a business as a going concern, through restructuring, change in ownership, mergers and other methods.

➲ The second objective is to maximize the value of assets of the corporate debtor and the third objective is to promote entrepreneurship, availability of credit, and balancing the interests. The Code says that the order of these objectives is "sacrosanct".

➲ Keeping this order in mind, when one looks at the IBBI data for the 3,400 cases admitted under the IBC in the last six years, half or more than 50% of the cases ended in liquidation, and only 14% could find a proper resolution, which is the first objective.

Time taken:

➲ The IBC was touted as a time-bound mechanism in the face of the often laggard states of older mechanisms. Timeliness is key here so that the viability of the business or the value of its assets does not deteriorate further.

➲ The IBC initially stipulated a 180-day deadline to complete the resolution process, with a permitted 90-day extension.

➲ The IBC was subsequently amended to further make the total timeline for completion 330 days— almost a year. While in 2018, when the timeline was 180+90 days, most cases (from companies that owed less than ₹50 crore to those which owed more than ₹1000 core) were completed in under 300 days.

➲ However, in FY22, it took 772 days to resolve cases involving companies that owed more than ₹1,000 crore. The average number of days it takes to resolve such cases increased rapidly over the past five years.

Haircuts:

➲ A haircut is the debt foregone by the lender as a share of the outstanding claim. The Parliamentary Stan¬ding Committee on Finance pointed out in 2021, that in the five years of the IBC, creditors on an average had to bear an 80% haircut in more than 70% of the cases.

➲ There are also other challenges to the IBC, some of which were pointed out by the Standing Committee. These were related to the conduct of the CoCs and the IPs.

➲ The Committee stated that the committee of creditors has significant discretion in accepting resolution plans and appointing IPs and called for more transparency and the framing of a professional code of conduct for the CoC.

What recommendations have been made by experts and judicial authorities?

➲ In order to address the delays, the Parliamentary Standing Committee suggested that the NCLT should not take more than 30 days after filing, to admit the insolvency application and transfer control of the company to a resolution process.

➲ Citing the more than 50% vacancy in the Tribunal compared to the sanctioned strength, it suggested recruitment in advance based on the projected number of cases.

➲ It also recommended the setting up of dedicated benches of the NCLT for IBC cases. To reduce caseloads, the Committee suggested that the pre-packs option be extended to all corporates after review. This is because, under PIRP, unlike CIRP, the debtor continues to manage company operations during the resolution process.

➲ The IBBI has also called for a new yardstick to measure haircuts. It suggested that haircuts not be looked at as

the difference between the creditor's claims and the actual amount realised but as the difference between what the company brings along when it enters IBC and the value realised.

- It asserts that a company may have already deteriorated significantly in value by the time it comes under the Code's process, so the value realised should pertain to the company's existing assets and not previous assets.

STRENGTHENING THE CSR FRAMEWORK IS A PROFITABLE IDEA

Context:

- Ever since the establishment of the Corporate Social Responsibility (CSR) regime in India under Section 135 of the Companies Act 2013, CSR spending in India has risen from ₹10,065 crore in 2014-15 to ₹24,865 crore in 2020-21.
- But there is no data to verify whether this increase is commensurate with the increase in profits of Indian and foreign (having a registered arm in India) companies.

Partial participation:

- Besides, there were 2,926 companies in 2020-21 with zero spend on CSR while companies spending less than the prescribed limit of 2% rose from 3,078 in 2015-16 to 3,290 in 2020-21.
- There was also a decline in the number of companies participating in CSR; 25,103 in FY2019 to 17,007 in FY2021.

Stipulated requirement:

- If a company spends an amount in excess of the minimum 2%, as stipulated, the excess amount is liable to be set off against spending in the succeeding three financial years. The latter proviso in the Act weakens the former provision since the requirement of 2% is only a minimum requirement.
- Ideally, companies should be encouraged to spend more than this. Besides, many private companies have registered their own foundations/trusts to which they transfer the statutory CSR budgets for utilisation. It is unclear if this is allowed under the Companies Act/CSR rules.

Issues/Challenges:

Geographical bias:

- The first proviso to Section 135(5) of the Act is that the company should give preference to local areas/areas around it where it operates. This is logical.
- However, a report says that 54% of CSR companies are concentrated in Maharashtra, Tamil Nadu, Karnataka, and Gujarat (receiving the largest CSR spends) while populous Uttar Pradesh and Madhya Pradesh receive little.
- A high-level committee observed in 2018 that the emphasis on 'local area' in the Act is only directionary and that a balance has to be maintained.
- Unfortunately, this ambiguity has left much to the discretion of the boards of these companies in the absence of clear percentages for local spends vis-à-vis other area spends.

Focus on environmental issues:

- Item (iv) of Schedule VII of the Act deals with broader environmental issues to create a countervailing effect.
- However, an analysis of CSR spending (2014-18) reveals that while most CSR spending is in education (37%) and health and sanitation (29%), only 9% was spent on the environment even as extractive industries such as mining function in an environmentally detrimental manner in several States.

Monitoring:

- Under the existing regulation, monitoring is by a board-led, disclosure-based regime, with companies reporting their CSR spends annually to the Corporate Affairs Ministry (MCA) through filing of an annual report. It is not known if there is a review of these reports and companies taken to task.
- A major issue with this design is that it focuses on output rather than quality of the expenditure and its impact.
- The Standing Committee on Finance had also observed that the information regarding CSR spending by companies is insufficient and difficult to access.

Auditing:

- As per the 'Technical Guide on Accounting' issued by the Institute of Chartered Accountants of India, a company is only required to mention its CSR spends, non-spend, underspend, and overspend in the 'Notes to Accounts'.
- Additionally, an auditor can investigate only the details of spending and at most can question the board about its authenticity.
- However, the auditor is not mandated to qualify the accounts for non-compliance or inadequate CSR performance in the audit report, a feature which can be instrumental in ensuring its compliance.

Roadmap:

➲ There is a need to curate a national-level platform centralised by the MCA where all States could list their potential CSR-admissible projects so that companies can assess where their CSR funds would be most impactful across India with, of course, preferential treatment to areas where they operate.

➲ Invest India's 'Corporate Social Responsibility Projects Repository' on the India Investment Grid (IIG) can serve as a guide for such efforts.

➲ This model would be very useful for supporting deserving projects in the 112 aspirational districts and projects identified by MPs under the Government's Sansad Adarsh Gram Yojana.

Suggestions:

➲ Companies need to prioritise environment restoration in the area where they operate, earmarking at least 25% for environment regeneration.

➲ All CSR projects should be selected and implemented with the active involvement of communities, district administration and public representatives.

➲ Recommendations by the high-level committee in 2018 should be incorporated in the current CSR framework to improve the existing monitoring and evaluation regime.

➲ These include strengthening the reporting mechanisms with enhanced disclosures concerning selection of projects, locations, implementing agencies, etc.; bringing CSR within the purview of statutory financial audit with details of CSR expenditure included in the financial statement of a company, and mandatory independent third-party impact assessment audits.

➲ Since the Government itself has begun separate schemes for sanitation, water supply and education (listed in Schedule VII), steps to stop duplication and fraud are essential.

➲ CSR non-spend, underspend, and overspend should be qualified by the auditor in the audit report as a qualification to accounts, and not just as a note to accounts.

➲ The MCA and the line departments need to exercise greater direct monitoring and supervision over CSR spend by companies through the line ministries (for public sector undertakings) and other industry associations (for non-public units) instead of merely hosting all information on the Ministry's website.

RBI TO LAUNCH E-RUPEE

Why in news?

➲ The Reserve Bank of India will soon begin the pilot launch of e-rupee for specific use cases.

➲ Releasing a concept note on Central Bank Digital Currency (CBDC), the RBI said it will launch the digital currency with the aim to strengthen India's digital economy, provide more efficient payment systems and keep a check on money laundering.

Details:

➲ The RBI's digital currency is not meant to replace the existing payment systems but to render an additional route to users.

➲ Supported by state-of-the-art payment systems of India that are affordable, accessible, convenient, efficient, safe and secure, the Digital Rupee (e₹) system will further bolster India's digital economy, make the monetary and payment systems more efficient and contribute to furthering financial inclusion.

➲ On 1 February 2022, the central government had announced the launch of the digital rupee, CBDC from the fiscal year 2022-23 onwards in the Union Budget.

What is CBDC?

➲ The Central Bank Digital Currency is a legal tender issued in a digital form by a central bank.

➲ It is akin to sovereign paper currency but takes a different form, exchangeable at par with the existing currency and shall be accepted as a medium of payment, legal tender, and a safe store of value. CBDCs would appear as a liability on a central bank's balance sheet.

➲ RBI's digital currency can be easily converted against commercial bank money and cash.

➲ CBDC is a "fungible legal tender" for which holders do not require to have a bank account.

➲ The central bank digital currency is expected to generate huge sets of data in real time.

Types of CBDC:

➲ Retail CBDC, an electronic version of cash, would be available for everyone.

➲ Wholesale CBDC is designed to give exclusive access to select financial institutions. This e-rupee will be used for the settlement of interbank transfers and related wholesale transactions.

➲ It is believed that retail CBDC can provide access to safe money for payment and settlement as it is a direct liability of the central bank. Wholesale CBDC has the potential to transform settlement systems for financial transactions and make them more efficient and secure.

- Going by the potential offered by each of them, there may be merit in introducing both CBDC-W and CBDC-R.

How is CBDC different from cryptocurrency?

- The RBI's digital currency is different from cryptocurrencies which are decentralised and lack the tag of being a 'legal tender'.
- Unlike cryptocurrencies which are volatile assets, the CBDC is a fiat currency that is designed for stability and safety.
- The proliferation of crypto assets can pose significant risks related to money laundering & financing of terrorism.
- Further, the unabated use of crypto assets can be a threat to the monetary policy objectives as it may lead to creation of a parallel economy and will likely undermine the monetary policy transmission and stability of the domestic currency. It will also adversely affect the enforcement of foreign exchange regulations, especially, the circumvention of capital flow measures.

Which countries have CBDC?

- 10 countries and territories have so far rolled out CBDCs including Jamaica, The Bahamas, Antigua and Barbuda, St Kitts and Nevis, Monserrat, Dominica, Saint Lucia, St Vincent and the Grenadines, Grenada and Nigeria.
- Countries like the United States, Canada, the United Kingdom are also exploring introducing central bank-issued digital currency.
- China is also seeking to expand its use of digital yuan (e-CNY) which was launched earlier in 2022 on a pilot basis.

GLOBAL HUNGER INDEX (GHI) 2022

GHI Score Trend for India

Why in news?

- India ranks 107 out of 121 countries on the Global Hunger Index in which it fares worse than all countries in South Asia barring war-torn Afghanistan.

What is India's score relative to those of the others?

- With a score of 29.1, which falls in the 'serious' category of hunger, India was ranked behind its neighbours Nepal (81), Pakistan (99), Sri Lanka (64), and Bangladesh (84).
- Afghanistan (109) is the only country in South Asia that performs worse than India on the index.
- India has been recording decreasing GHI scores over the years. In 2000, it recorded an 'alarming' score of 38.8, which reduced to 28.2 by 2014. The country has started recording higher scores since then.
- While India has been consistently recording lower values for the four indicators, it started going up in 2014 for undernourishment and the prevalence of wasting in children.
- The proportion of undernourishment in the population went from 14.8 in 2014 to 16.3 in 2022, and the prevalence of wasting in children under five years jumped from 15.1 in 2014 to 19.3 in 2022.

India's performance:

- India's child wasting rate (low weight for height), at 19.3%, is worse than the levels recorded in 2014 (15.1%) and even 2000 (17.15%), and is the highest for any country in the world and drives up the region's average owing to India's large population.
- Prevalence of undernourishment, which is a measure of the proportion of the population facing chronic deficiency of dietary energy intake, has also risen in the country from 14.6% in 2018-2020 to 16.3% in 2019-2021. This translates into 224.3 million people in India considered undernourished out of the total 828 million people undernourished globally.
- India has shown improvement in the other two indicators - child stunting has declined from 38.7% to 35.5% between 2014 and 2022 and child mortality has also dropped from 4.6% to 3.3% in the same comparative period.
- On the whole, India has shown a slight worsening with its GHI score increasing from 28.2 in 2014 to 29.1 in 2022. Though the GHI is an annual report, the rankings are not comparable across different years. The GHI score for 2022 can only be compared with scores for 2000, 2007 and 2014.

Global scenario:

- Globally, progress against hunger has largely stagnated in recent years. The 2022 GHI score for the world is considered "moderate", but 18.2 in 2022 is only a slight improvement from 19.1 in 2014.
- This is due to overlapping crises such as conflict, climate change, the economic fallout of the COVID-19 pandemic as well as the Ukraine war, which has increased global food, fuel, and fertiliser prices and is expected to "worsen hunger in 2023 and beyond."
- There are 44 countries that currently have "serious" or "alarming" hunger levels and "without a major shift, neither the world as a whole nor approximately 46 countries are projected to achieve even low hunger as measured by the GHI by 2030.
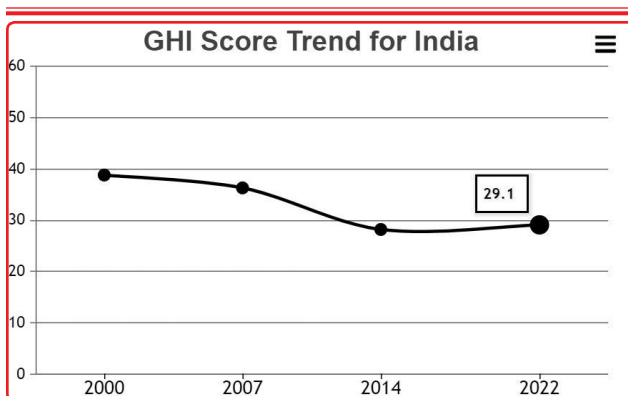
➲ Yemen has ranked in the lowest position at 121, while the top of the list is dominated by European nations including Croatia, Estonia and Montenegro. Among Asian nations, China and Kuwait have ranked the highest.

➲ China is among the countries collectively ranked between 1 and 17 having a score of less than five.

What is Global Hunger Index (GHI)?

➲ The Global Hunger Index (GHI) is a tool for comprehensively measuring and tracking hunger at global, regional, and national levels.

➲ Jointly published by Concern Worldwide and Welthungerlife, the GHI lists countries by 'severity'.

➲ The GHI has been brought out almost every year since 2000; with 2022 report being the 15th one. A low score gets a country a higher ranking and implies a better performance.

➲ The reason for mapping hunger is to ensure that the world achieves "Zero Hunger by 2030", one of the Sustainable Development Goals laid out by the United Nations. It is for this reason that GHI scores are not calculated for certain high-income countries.

➲ GHI scores are based on the values of four component indicators - undernourishment, child stunting, child wasting and child mortality.

➲ The GHI score is calculated on a 100-point scale reflecting the severity of hunger, where zero is the best score (no hunger) and 100 is the worst.

How is hunger measured?

➲ Four main indicators:
   a) Undernourishment (which reflects inadequate food availability): calculated by the share of the population that is undernourished (that is, whose caloric intake is insufficient);
   b) Child Wasting (which reflects acute undernutrition): calculated by the share of children under the age of five who are wasted (that is, those who have low weight for their height);
   c) Child Stunting (which reflects chronic undernutrition): calculated by the share of children under the age of five who are stunted (that is, those who have low height for their age);
   d) Child Mortality (which reflects both inadequate nutrition and unhealthy environment): calculated by the mortality rate of children under the age of five (in part, a reflection of the fatal mix of inadequate nutrition.

➲ Each country's data are standardised on a 100-point scale and a final score is calculated after giving 33.33% weight each to components 1 and 4, and giving 16.66% weight each to components 2 and 3.

➲ Countries scoring less than or equal to 9.9 are slotted in the "low" category of hunger, while those scoring between 20 and 34.9 are in the "serious" category and those scoring above 50 are in the "extremely alarming" category.

WHY DID BANK BAILOUT RESEARCH GET THE NOBEL?

Why in news?

➲ Recently, three economists Ben Bernanke, Douglas Diamond and Philip Dybvig were jointly bestowed the Nobel Prize in Economics for 2022 by the Royal Swedish Academy of Sciences.

Why were they chosen for the award?

➲ The Nobel in Economics has been awarded to Bernanke, Diamond and Dybvig for their "research on banks and financial crises" undertaken in the early 1980s which have formed the foundations of what constitutes most modern banking research.

➲ Their analyses nearly four decades ago, still inform efforts to emphasise the vitality of banks to keep the economy functioning smoothly, the possible mechanisms to make them more robust amid crises periods, and how bank collapses can fuel a larger financial crisis that can rattle economies.

➲ Moreover, their work went beyond the realm of just theory and has had significant practical import in regulating financial markets and pre-empting or coping with crises.

What are the key insights from these economists' work?

Ben Bernanke:

➲ Bernanke, who was the U.S. Federal Reserve chief from 2006 to 2014, had analysed the worst modern economic crisis, the Great Depression of the 1930s that began in the U.S. but bludgeoned economies across the world for several years.

➲ He turned conventional thinking of the time on its head by arguing that bank failures in the 1930s were not just a result of the Depression but, in fact, a contributing factor to the lingering scars on economic activity.

➲ Apart from the obvious impact of collapsing banks on its depositors' fortunes, he argued that critical borrower profiles were lost when banks imploded, thus hindering the ability to channelise savings to investments that could have revived the economy faster.

- Previous economic historians had only focused on those banks' failures as a factor that affected the economy in as much as there was a contraction in money supply.
- He proved otherwise by using 'historical documentary evidence and empirical data to uncover the importance of the credit channel for the propagation of the depression.

Douglas Diamond & Philip Dybvig:

- Diamond and Dybvig, who completed their doctorates at Yale a year apart in the late 1970s, came together in 1983 to postulate theoretical models on banks' role in an economy and what makes them vulnerable to 'runs' on their deposits.
- While depositors want any-time access to their savings parked with banks, banks don't keep the money idle, investing and lending it onwards to borrowers for longer tenures.
- This tenure mismatch in banks' asset-liability profiles mean that even rumours about a bank's imminent collapse could become a self-fulfilling prophecy as all savers make a beeline to hastily withdraw their money though a bank only keeps part of those savings handy to meet routine withdrawals from a part of their depositor base.
- To meet a simultaneous withdrawal rush, a bank would be compelled to sell its long-term investments, even if at a loss, in the hope that the deposit bleeding stops before it runs out of cash in hand.

What framework did they propose?

- They provided solutions such as deposit insurance or a 'lender of last resort' policy that governments can consider to avoid such failures. When depositors know that the state has guaranteed their money, they no longer need to rush to the bank as soon as rumours start about a bank run.
- Most countries have deposit insurance schemes in place now, even as they hope and strive to ensure the eventuality of these risk covers being tapped doesn't arise. Their work stimulated a flurry of subsequent studies yielding new fundamental insights on issues such as financial contagion, inside money creation, financial propagation, and financial regulation.
- The theoretical and empirical findings of Bernanke, Diamond, and Dybvig thus reinforce each other. Together they offer important insights into the beneficial role that banks play in the economy, but also into how their vulnerabilities can lead to devastating financial crises.

Why have they been picked now?

- A fresh crisis is emerging from the COVID-19 pandemic-induced haemorrhagin.
- The International Monetary Fund (IMF) has warned that the 'worst is yet to come' and recessionary conditions loom for many countries, as the war in Europe stretches on amid a 'cost of living' crisis vitiated by food and energy worries.
- The Nobel jury's picks may well be construed as a reminder to governments about lessons that would come in handy again as the current tumult unfolds with fears about impending shocks to the banking system.
- These economists' findings have been proven 'extremely valuable for policymakers, as is evident in the actions taken by central banks and financial regulators in confronting two recent major crises; the Great Recession triggered by the global financial crisis between 2007-09 when shadow banks like Lehman Brothers collapsed and the economic downturn that was generated by the COVID-19 pandemic.

Does this have any resonance for India?

- Indian households as well as policy makers are all too familiar with bank failures in the recent past, starting from the trouble at the privately run Global Trust Bank to freezes in withdrawals at several co-operative banks.
- Government and regulatory interventions to sustain faith in the banking system have included higher deposit insurance cover, facilitating takeovers of weaker lenders and steps to rein in bad loans.
- The key learnings from the Nobel Laureates' work seem to have been embraced by Indian authorities. But as the government pursues privatisation of banks while aiming to consolidate lenders to create larger entities to finance bigger investments and higher growth, utmost regulatory and legislative vigil is warranted to pre-empt any mishaps in the financial sector.
- As the IMF's chief economist has warned, the risk of monetary, fiscal or financial policy miscalibration has risen sharply amid high uncertainty and growing fragilities.

RBI & MONITORING OF BANKS

Why in news?

- The Reserve Bank of India (RBI) has placed Dhanlaxmi Bank under tight monitoring with the Thrissur-based private bank's financial position coming under greater public scrutiny.

➩ The RBI's move comes in the wake of the intense court battle waged by a group of minority shareholders against the bank's management team over inadequate financial disclosures, rising expenses, and general mismanagement of the business.

How did it get to this situation?

➩ Dhanlaxmi Bank's capital to risk weighted assets ratio (CRAR) dropped to around 13% at the end of March 2022 from 14.5% a year ago, prompting the RBI to take stock of the financial health of the bank.

➩ Under Basel-III norms, which were adopted by financial regulators across the globe in the aftermath of the financial crisis of 2007-08 that involved major failures in the banking system, banks are supposed to maintain their CRAR at 9% or above. The RBI's move to increase its oversight on Dhanlaxmi Bank is seen as a response to the deterioration in the bank's capital adequacy.

Prompt Corrective Action (PCA):

➩ Dhanlaxmi Bank's capital adequacy has dropped below the stipulated standards in the past and it has even been placed under the prompt corrective action framework (PCA) by the RBI to deal with serious deteriorations in its financial position.

➩ Under the PCA, the RBI places restrictions on lending by troubled banks and keeps a close eye on them until their financial position improves sufficiently.

➩ Dhanlaxmi Bank has been accused by its minority shareholders of mismanagement in the wake of the decision of the management to expand the bank to new geographies amid an unexpected rise in expenses. The management has also been accused of inadequate disclosure of information to explain the rise in costs.

Why is capital adequacy important for a bank?

➩ Capital adequacy ratio is an indicator of the ability of a bank to survive as a going business entity in case it suffers significant losses on its loan book. A bank cannot continue to operate if the total value of its assets drops below the total value of its liabilities as it would wipe out its capital (or net worth) and render the bank insolvent.

➩ So, banking regulations such as the Basel-III norms try to closely monitor changes in the capital adequacy of banks in order to prevent major bank failures which could have a severe impact on the wider economy.

➩ The capital position of a bank should not be confused with cash held by a bank in its vaults to make good on its commitment to depositors.

CRAR:

➩ The CRAR, which is a ratio that compares the value of a bank's capital (or net worth) against the value of its various assets weighted according to how risky each asset is, is used to gauge the risk of insolvency faced by a bank.

➩ The riskier a type of asset held in a bank's balance sheet, the higher the weightage given to the value of the asset while calculating the bank's capital adequacy ratio. This causes the capital adequacy ratio of the bank to drop, thus signalling a higher risk of insolvency during crises.

➩ In other words, the CRAR tries to gauge the risk posed to the solvency of the bank by the quality or riskiness of the assets on the bank's balance sheet.

➩ In the case of Dhanlaxmi Bank, the write-down and reclassification of tier-2 bonds, which are considered effectively to be equivalent to equity capital since they are unsecured, in the next few months is expected to adversely affect the bank's capital adequacy ratio.

Efforts to raise capital:

➩ Dhanlaxmi Bank has been trying to issue additional shares in the open market through a rights issue in order to deal with its capital adequacy woes. Through a rights issue, the bank will be able to raise more equity capital from existing shareholders. This is in contrast to an initial public offering where shares are issued to new shareholders.

➩ The additional capital could help in raising the bank's capital adequacy ratio which is necessary to comply with regulations and serve as a buffer that absorbs any losses incurred by the bank on its loan book in the case of any crisis in the future.

➩ The rights issue, however, has been delayed by the ongoing court battle with minority shareholders and the bank's non-compliance with rules regarding the composition and strength of the management board. This delay could compromise the bank's ability to meet the RBI's stipulated norms on capital adequacy anytime soon.

What happens next?

➩ The RBI is likely to keep a close eye on Dhanlaxmi Bank over the next few months as the bank's ability to meet capital adequacy norms comes under greater strain.

➩ The central bank may even decide to intervene in case the delay of the rights issue threatens the bank's ability to comfortably meet the capital adequacy norms recommended under Basel-III regulations.

➩ In fact, Dhanlaxmi Bank could even become an acquisition target in case its management is unable to raise the required capital. In such a case, an investor with the capital required to immediately boost the bank's capital adequacy may well find favour with the RBI.

NEED TO FOCUS ON NUTRITION, NOT HUNGER

Context:

➩ Every October, the Global Hunger Index (GHI) is released. It generally creates an uproar, and with good reason.

Methodology:

➲ The fountainhead is a 16-year-old German and Irish organisation, which measures and ranks countries on a hunger index at the global, regional, and national levels, but not at the sub-national level where some Indian states fare better.

➲ The GHI's stated aim is to reduce hunger around the world. But its methodology focuses disproportionately on less than five-year-olds.

Why GHI contradicts in Indian scenario?

➲ In common parlance, hunger and nutrition are two different things. Hunger is associated with food scarcity and starvation. It produces images of emaciated people holding empty food bowls. GHI uses childhood mortality and nutrition indicators.

➲ But its preamble states "communities, civil society organisations, small producers, farmers, and indigenous groups... shape how access to nutritious food is governed." This suggests that GHI sees hunger as a food production challenge when, according to the FAO, India is the world's largest producer and consumer of grain and the largest producer of milk; when the per capita intake of grain, vegetables and milk has increased manifold.

➲ It is, therefore, contentious and unacceptable to club India with countries facing serious food shortages, which is what GHI has done.

Issue of child nutrition in India:

➲ But there is no denying that in India, nutrition, particularly child nutrition, continues to be a problem. Unlike the GHI, the National Family Health Survey (NFHS) does a good job of providing comparative state-level data, including the main pointers that determine health and nutrition.

➲ NFHS provides estimates of underweight, (low weight for age), stunting (low height for age) and wasting (low weight for height).

➲ These conditions affect preschool children (those less than 6 years of age) disproportionately and compromise a child's physical and mental development while also increasing the vulnerability to infections.

➲ Moreover, undernourished mothers (attributable to social and cultural practices,) give birth to low-birth-weight babies that remain susceptible to infections, transporting their handicaps into childhood and adolescence.

Challenges

➲ The irony is that issues related to nutrition and their solutions, although they appear simple and cheap, need delving into individual homes.

Breastfeeding:

➲ The first child nutrition challenge relates to breastfeeding. The WHO and UNICEF recommend that breastfeeding should be initiated within the first hour of birth and infants should be exclusively breastfed for the first six months.

➲ According to NFHS 5, in India, the percentage improvement of children who were exclusively breastfed when under six months, rose from 55 per cent in NFHS 4 to 64 per cent in NFHS 5. That is progress, but it is not enough.

➲ By not being breastfed, an infant is denied the benefits of acquiring antibodies against infections, allergies and even protection against several chronic conditions.

➲ NFHS says that only 42 per cent of infants are breastfed within one hour of birth, which is the recommended norm. Interestingly, Chhattisgarh, Jharkhand, Madhya Pradesh, Odisha and Maharashtra, Manipur, Rajasthan, Himachal Pradesh, and Haryana score above 70 per cent whereas the ones below 50 per cent include Bihar, Punjab, Kerala, Tamil Nadu, and West Bengal. The others are in between.

Young child feeding practices:

➲ The second issue relates to young child feeding practices. At root are widespread practices like not introducing semi-solid food after six months, prolonging breastfeeding well beyond the recommended six months and giving food lacking in nutritional diversity.

➲ NFHS 5 shows that the improvement has been marginal over the last two reports and surprisingly, states like Maharashtra, Rajasthan, Assam, UP and Gujarat are at the tail end.

Outcome of poor nutrition:

➲ The third issue is the outcome of poor nutrition. According to NFHS 5, the percentage of stunted, wasted and underweight children is 36 per cent, 19 per cent and 32 per cent respectively.

➲ It is worrisome that states like Bihar, UP and Jharkhand have fallen from their own levels five years ago. Overall, there has been an eight percentage point increase in children suffering from anaemia, from 59 per cent in NFHS 4 to 67 per cent in NFHS 5. This has a lot to do with the mistaken belief that manufactured snacks are "good food".

➲ Anecdotally, there are reports that households in Dharavi, Asia's largest slum, spend up to Rs 30 per day

on packaged snacks like chips, papad and other over-salted edibles. Parents allow the child to sleep on an undernourished (virtually empty) stomach.

Recommendation:

- Almost one dozen nutrition programmes have been under implementation since 1975. Several more have been added of late, but most beneficiaries of these food distribution programmes are kids attending anganwadis or schools, adolescents, and pregnant and lactating mothers.
- This must continue but newborns, infants, and toddlers need attention too. Monitoring weight is an indicator, not a solution.

Way Forward:

- India has successfully overcome much bigger problems, reduced maternal and child mortality, improved access to sanitation, clean drinking water and clean cooking fuel.
- The states should be urged to examine the NFHS findings to steer a new course to improve the poshan practices for the youngest and the most vulnerable sections of society: Helping mothers to better the lives of their infants and toddlers right inside the home by measuring and demonstrating how much diet, food intake and child-rearing practices matter.

INTERNAL SECURITY

'PRACHANDA' LIGHT COMBAT HELICOPTER (LCH)

Why in news?

- Recently, the Indian Air Force (IAF) has formally inducted the first batch of indigenously-developed Light Combat Helicopter (LCH) at an event in Rajasthan's Jodhpur.
- It was inducted into the IAF's newly raised 143 Helicopter Unit.
- Designed and developed ground-up by Hindustan Aeronautics Limited (HAL), the Defence Minister gave the new chopper, the name of Prachanda.

Background:

- In March, the Union Cabinet approved the procurement of 15 Light Combat Helicopters (LCH) for Rs 3,887 crore, or about Rs 260 crore each. The Cabinet Committee on Security also approved the creation of infrastructure worth Rs 377 crore.
- Light Combat Helicopter Limited Series Production (LSP) is an indigenously designed, developed and manufactured, state-of-the-art modern combat helicopter containing approximately 45 per cent indigenous content by value, which will progressively increase to more than 55 per cent for the SP (series production) version.

Post Kargil:

- The inception of the LCH programme came during the Kargil War of 1999. It was then that India felt the absence of an attack helicopter which could operate in ultra-high altitude areas.
- India's then existing fleet of helicopters, mostly Russian, didn't have the capability to be deployed at such heights. The IAF was forced to use the MI-17 helicopters in a modified role.
- In 2006, the LCH project was launched when HAL announced its intention to develop such a copter could, which operate in the harsh desert conditions as well as the high altitude areas of Ladakh including the Siachen Glacier.
- The first maiden flight of the LCH was conducted successfully on 29 March in 2010 after many delays.
- Modifications took place on this prototype and finally after its weapons trials in January 2019 and in February 2020, HAL announced that the LCH was ready for 'operational induction'.

What makes the LCH so deadly?

- The LCH, designed and manufactured by HAL, is an attack helicopter that can be deployed in various roles, including tracking slow-moving aerial targets, insurgency, destroying enemy defences, search and rescue, anti-tank and scouting.
- The LCH, which contains around 45 per cent indigenous content by value, boasts of being the only attack helicopter in the world, which can land and take-off at an altitude of 5000 m (16,400 feet) with considerable load of weapons.
- The helicopter is powered by two HAL/Turbomeca Shakti turboshaft engines, each of which can generate up to 871kW and can run for up to 3,000 hours without maintenance.
- The engine received European Aviation Safety Agency certification in 2007. It features a Full Authority Digital Electronic Control system, which decreases the work of the pilot by automatically counting engine cycles.

Salient Features:

- It has a maximum speed of 268 km per hour and has a range of 550 km. The LCH has a maximum take-off weight of 5,800 kg.
- The attack helicopter has a glass cockpit accommodating two crew, who sit one behind the other. The cockpit is equipped with multifunction

displays, target acquisition and designation systems, and a digital video recorder to capture footage of the battlefield for use in debriefing.

- The LCH is equipped with state-of-the-art sensor suite. It includes a charge-coupled device camera, a forward-looking infra-red camera and a laser designator. The two cameras capture the location and position of enemies, ensuring clear visibility during bad weather conditions. The laser range-finder and designator aim laser-guided bombs and missiles towards the target.

- When it comes to weaponry, the LCH is loaded with firepower. It is armed with air-to-air and air-to-ground missiles. It also also has a 20 mm gun and 70 mm rockets.

- Earlier in April, the LCH also successfully fired Helina, a three-generation anti-tank guided missile and destroyed armour targets at a five-km range at Pokhran Ranges, developed by DRDO.

What makes it ideal for high-altitude operations?

- The LCH is an ideal platform for providing infantry soldiers fire support in 15,000-16,000 feet high contested areas such as Depsang, Galwan, and the heights north and south of Pangong Tso where Indian soldiers were facing off against Chinese intruders.

- Infantrymen at those oxygen-deprived altitudes cannot carry heavy weaponry for long distances, but a high-altitude attack helicopter would provide them with fire support, using its on-board, 20-millimetre turret gun, 70-millimetre rockets, and air-to-air missiles.

- It can also carry an anti-tank guided missile and the IAF is close to choosing one.

- For delivering firepower accurately onto the enemy, the LCH is integrated with cutting-edge target-sighting systems, including an electro-optic pod and a helmet mounted display that allows a pilot to aim at a target just by looking at it.

- The LCH's pilots are protected by armoured panels, self-sealing fuel tanks, a bulletproof windshield, damage-tolerant rotor blades, and a main gearbox that can run for 30 minutes even after a bullet hits it and drains out the oil.

- The LCH also has an electronic warfare system that detects incoming missiles and confuses them by scattering flares and chaff.

How will it serve the forces?

- The addition of the LCH will give India a further boost to the defence forces. The LCH can conduct combat search and rescue and destruction of enemy air defence.

- It can be deployed in high-altitude bunker-busting operations, counter-insurgency operations in the jungles and urban environments as well as for supporting ground forces.

- With these features, the LCH is bound to pose a problem for China and Pakistan, who continue to meddle at the borders. In fact, the LCH will be deployed along the Line of Actual Control.

- The LCH is also a boost for India's defence production. As per an Indian Express report, it has already obtained a no-objection certificate from the Ministry of Defence for countries like Malaysia, Thailand, Vietnam, Angola, Egypt, Indonesia, Ecuador and Nigeria.

ENVIRONMENT

STOCKHOLM CONVENTION TO TAKE FINAL CALL ON 5 PERSISTENT ORGANIC POLLUTANTS

Why in news?

- The 18th meeting of the Persistent Organic Pollutants (POP) Review Committee (POPRC-18) to the Stockholm Convention held in Rome has included five more chemicals in its agenda.

Details:

- The listed chemicals include a pesticide, a flame retardant and some plastic stabilising substances.

- Three of the listed chemicals; chlorpyrifos, chlorinated paraffin beyond prescribed standards and long-chain perfluoro carboxylic acids were already nominated at the 17th meeting (POPRC-17) in January 2022.

- Two chemicals; dechlorane plus, a flame retardant and UV-328, a stabiliser used in some personal care products which qualified for risk management evaluation at POPRC-17 will be evaluated at this session.

- POPRC-18 aims to list each of these chemicals in Annex A (elimination), B (restriction) and/or C (unintended release) of the Stockholm Convention.

Review stage:

- Draft risk profiles of these chemicals are being discussed at the POPRC-18 meeting. Experts will determine if these chemicals are POPs which demand global action due to their adverse effects on human health and the environment.

- Their draft risk profiles will be adopted and global action will be warranted if they fall into the hazardous chemicals category.

- These chemicals will then be elevated for the third review stage (Annex-F) or risk management evaluation.
- Socio-economic considerations associated with possible control measures are evaluated at this stage. Thereafter, they will be considered for recommendation to the Conference of the Parties to list them under the Stockholm Convention.

India's resistance:

- The United Nations Environment Programme's proposal to list chlorpyrifos as POP was resisted by India. Still, chlorpyrifos got nominated as Persistent organic pollutants.
- The Pesticides Manufacturers and Formulators Association of India (PMFAI) had obstructed listing chlorpyrifos under the Stockholm Convention.
- India had also opposed the decision to list flame retardant dechlorane plus.
- Chlorpyrifos was registered under the Insecticide Act of 1968 since 1977 and Anupam Verma Committee recommended its review for continued use in 2015.
- China and India are among the largest producers of chlorpyrifos. Nearly 48 per cent of chlorpyrifos or 24,000 tonnes was produced in India. Globally, some 50,000 tonnes of chlorpyrifos is being used annually, according to estimates by the China Crop Protection Industry Association.
- Nearly 48 per cent of chlorpyrifos, or 24,000 tonnes, was produced in India. Some 11,000 tonnes were used within the country and 12,000 tonnes were exported.
- Chlorpyrifos was approved for agricultural use in 2021, which includes its use as a pesticide against pests affecting Bengal gram, rice and cotton.
- It is one of the ten pesticides banned by Punjab and Haryana governments in August 2022.

About Stockholm Convention:

- Stockholm Convention is an international environmental treaty that aims to eliminate or restrict the production and use of POPs or the substances that persist in the environment and pose risk to our health.
- It was opened for signature in 2001 in Stockholm (Sweden) and became effective in 2004. India ratified the Stockholm Convention in 2006.
- The Stockholm Convention has listed 31 chemicals as of December 2020. This list is likely to expand further amid evidence pointing towards the health burden of hazardous chemicals and pesticides.
- Acute pesticide poisoning is an ongoing major global public health challenge, with about 385 million cases of unintentional acute pesticide poisoning and 11,000 deaths every year, according to a global study.

INDIA'S CARBON FOOTPRINT

Context:

- Carbon footprint of India's farming sector and way out.
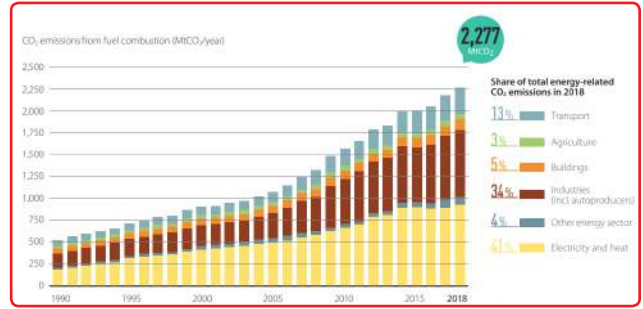
Industrial revolution & 'greenhouse gases':

- The U.S. Environmental Protection Agency (EPA) has pointed out that since the industrial revolution, which started around 1800, human activities have released large amounts of carbon dioxide (CO_2) due to fuel burning and other 'greenhouse gases' such as methane, nitrous oxide, and compounds of sulphur, phosphorous, ozone into the atmosphere, changing the earth's climate.
- Atmospheric carbon dioxide levels have increased by over 40%, from 280 ppm in the 18th century to 414 ppm in 2020, and greenhouse gases level by over these 200 years.

India's role:

- India had 170 million people in 1800, which has risen to 1.4 billion people today. And industrial revolution started only after India's Independence 75 years ago.
- While it has helped in reduction of poverty, it has also led to rise in atmospheric carbon dioxide and greenhouse gases.

Role of farming sector in greenhouse gases:

- The Food and Agriculture Organisation (FAO) points out that India have a rural population that constitutes 70% of the country, and their main occupation is agriculture. This gives India a total food-grain production of 275 million tonne.
- India is the second largest producer of rice, wheat, sugarcane, cotton and groundnuts. It, thus, becomes important that India try and reduce its carbon footprint as much as possible, more in its farming sector.

Initiatives:

- Farmers have come up with some admirable methods, with the help of agricultural professionals, by using solar panels in their fields, so that they can avoid diesel for groundwater pumps.
- Climate-friendly agriculture offers new income sources and is more sustainable that India's carbon emissions could drop by 45-62 million tonnes annually. The government and professional groups have helped rural farmers put in solar panels to save money and gain greater income.

Millets:

- Indian farmers not only grow rice and wheat but produce other foodgrains as well. They grew about

121.5 million tonnes of rice and 109 million tonnes of wheat during the year 2020-2021. They also produce other foodgrains such as millets (bajra), cassava and more.

- They grow about 12 million tonnes of millets annually. Likewise, the amount of maize produced per year is about 28.6 million tonnes. It may also be added that millets have more proteins (7.3 m per 100 g), fat (1.7 g per 100 g) and fibre content (4.22g per 100g) than rice (protein content 2.7 g per 100 g; fat content 0.3 g per 100 g; and fibre content 0.4 g per 100 g).

- It is, thus, healthier to add more millets in our diet, besides rice and wheat. And wheat is superior to rice as it has more proteins (13.2 g per 100 g), fat (2.5 g per 100 g), and fibre (10.7 g per 100 g).

Way Forward:

- India has about 20-39% vegetarians and 70% of the population eat meat mainly chicken, mutton and fish. India, with its many rivers, has a vast coastline which is rich in fishes.

- And fishes have high nutritional value and help in reducing carbon footprint. Thus, with farmers, meat sellers and fishermen, each contributing to India in reducing carbon footprint, can hope to be an exemplary nation for the EPA.

BATTLING AIR POLLUTION IN DELHI

Why in news?

- With air pollution choking Delhi every winter, the Delhi government has launched a new action plan to tackle the problem.

Green War Room:

- Under the 15-point 'winter action plan', a Green War Room has been set up to monitor air pollution 24×7. The war room will ensure the effective implementation of the action plan.

- It will comprise a 12-member team of environmental scientists, 'green fellows' and trainee engineers.

- It will monitor air pollution levels 24×7 and ensure that all necessary measures are taken to curb the pollution in accordance with the amended GRAP (Graded Response Action Plan). The war room will also analyse pollution data of the city.

Anti-dust campaign:

- The Delhi government will kick-off an anti-dust campaign on 6 October under which surprise assessments will be conducted at construction sites to curb dust pollution.

- As many as 586 teams have been established to keep an eye on construction sites.

- Construction sites bigger than 5,000 square metres (sqm) will have to mandatorily deploy one anti-smog gun, those over 10,000 sqm have to install two such guns and for sites bigger than 20,000 sqm, four anti-smog guns are compulsory.

- If these measures are not followed by companies at construction sites, then strict action will be taken against them under the anti-dust campaign.

- Moreover, 80 road sweeping machines will be used to stem pollution arising from road dust. Nearly 521 machines for water sprinkling to manage dust pollution and 150 mobile anti-smog guns will be deployed.

Stubble burning:

- The bio-decomposer developed by the PUSA institute will be distributed to the farmers without any cost.

- The bio-decomposer, which is in liquid form, is sprayed on the stem of the crop after the harvest; the stem decomposes and thus reducing the requirement for stubble burning.

Pollution check certificate must:

- From 25 October, vehicle owners will have to produce valid pollution under control (PUC) certificates for buying fuel at petrol pumps in Delhi.

- To control vehicular emissions, alternative routes will be suggested for more than 200 roads with heavy traffic for decongestion.

Firecrackers banned:

- The Delhi government has prohibited the online sale and delivery of firecrackers in Delhi till 1 January next year.

- There is already a ban on the production, storage, distribution and purchase of firecrackers.

- Over 200 teams will oversee the implementation of the ban.

Modified GRAP:

- The revised Graded Response Action Plan, a set of anti-air pollution measures, will be implemented in a stringent manner.

- Earlier, the curbs were imposed only after the concentration of PM2.5 and PM10 reached a certain limit. However, the measures will come into effect this year on the basis of Air Quality Index (AQI) values.

As per the new GRAP, the four stages of adverse air quality in Delhi have been classified as:

a) Stage I is if the AQI touches from 201-300, then the air is considered 'poor'.

b) Stage II is for 'very poor' air when AQI is between 301-400.

c) Stage III classification is for 'severe' air when AQI is from 401-450.

d) Stage IV is when AQI is above 450, the air will be labelled as 'severe plus'.

Ban on waste burning in open:

➲ The government in Delhi has banned the burning of garbage in the open.

➲ As many as 611 teams will fine those involved in the open-burning of garbage in the city.

Identifying pollution hotspots:

➲ The Delhi government has identified 13 hotspots that are being monitored.

➲ Strict pollution control measures will be implemented in these areas.

PNG for industries:

➲ Industrial units have to operate on piped natural gas (PNG).

➲ Although all the registered industrial units have switched to PNG, if there is any industrial unit which is using other pollution-causing fuels, they will be under the radar of 33 specialised teams which will ensure that they only use PNG.

Green Delhi App:

➲ The Green Delhi App was launched two years ago for people to report their problems concerning pollution.

➲ The maximum complaints were related to the Municipal Corporation of Delhi (32,573), followed by Public Works Department (9,118) and Delhi Development Authority (3,333).

Green cover:

➲ The Delhi Government had set a target of 42 lakh saplings in the national capital.

➲ A real-time source apportionment study was carried out in collaboration with IIT Kanpur to find out the level of pollution and its source at any specific point in time.

E-waste park:

➲ An e-waste park will be set up to handle the pollution-causing electronic waste.

➲ The size of the park is 20 acres and it will be located in Holambi Kalan. Once inaugurated, all the e-waste of Delhi will be taken to this park and processed scientifically.

Paryavaran mitra:

➲ People can become 'paryavaran mitra' or volunteers who will spread awareness about environmental protection in Delhi.

➲ As per the Delhi chief minister, more than 3,500 volunteers have already registered.

Talks with Centre, states:

➲ The Delhi government has called for coordinated efforts with the neighbouring states and the central

government to check air pollution in the national capital.

➲ The Delhi chief minister has asked states ban diesel generators and direct brick factories to enforce zig-zag techniques in manufacturing to control pollution.

Delhi's winter pollution:

➲ Stubble burning from neigbouring states and use of biomass for household heating and cooking are the two major causes of the surge in air pollution in Delhi during the winter season, as per the study conducted by Council on Energy, Environment and Water (CEEW).

➲ Transport (12 per cent), dust (seven per cent), and domestic biomass burning (six per cent) are the prime sources of locally-generated pollution in Delhi during winter (15 October-15 January).

➲ 64 per cent of Delhi's winter pollution load comes from outside its boundaries.

➲ Biomass burning of agricultural waste during the stubble burning phase and burning for heating and cooking needs during peak winter are estimated to be the major sources of air pollution from outside the city.

Health issues:

➲ The respiratory issues also witness a rise in the national capital during winter.

➲ Emergency hospital admissions linked with respiratory and cardiac stress and symptoms increase during winter months every year. Due to long-term exposure to air pollution, the health of the vulnerable is already compromised.

SUSTAINABLE FORESTRY PARAMOUNT FOR BIODIVERSITY CONSERVATION: FAO

Context:

➲ The role of forests in maintaining biodiversity is explicitly recognised by the United Nations Strategic Plan for Forests 2017–2030. In 2019, Food and Agriculture Organization (FAO) adopted the Strategy on Mainstreaming Biodiversity across Agricultural Sectors

➲ FAO's forestry statutory body, Committee on Forestry (COFO), had asked FAO to review biodiversity mainstreaming in forestry in its 25th session in 2020.

⮑ The report was released recently, at the 8th World Forest Week on the sidelines of the 26th session of COFO taking place in Rome, Italy.

Stakeholders:

⮑ It was produced through a partnership between FAO and the non-profit Center for International Forestry Research (CIFOR), the lead centre of the CGIAR Research Program on Forests, Trees and Agroforestry.

⮑ CGIAR is a global partnership that unites international organisations engaged in research about food security.

What is Mainstreaming biodiversity?

⮑ Forests that are managed primarily for economic benefits are critical for biodiversity conservation. Mainstreaming biodiversity in such 'production forests' is paramount.

⮑ Embedding biodiversity considerations into policies, strategies and practices of key public and private actors to promote the conservation and sustainable use of natural resources is called 'mainstreaming biodiversity'.

⮑ Mainstreaming biodiversity in forestry involves prioritising forest policies, plans, programmes, projects and investments that have a positive impact on biodiversity at the ecosystem, species and genetic levels.

⮑ Biodiversity mainstreaming in the forest sector requires integrated multi-stakeholder approaches that cross-sectoral boundaries.

Forests:

⮑ Forests cover 31 per cent of the world's land surface, store an estimated 296 gigatonnes of carbon and are home to most of the world's terrestrial biodiversity.

⮑ The world's forests provide habitats for about 80 per cent of amphibian species, 75 per cent of bird species and 68 per cent of mammal species.

⮑ In addition, about 60 per cent of all vascular plants occur in tropical forests. But forests and their biodiversity continue to be lost at an alarming rate.

Threats:

⮑ Weak governance and law enforcement are the biggest stumbling blocks behind biodiversity conservation in protected areas

⮑ Deforestation is the greatest driver of the loss of valuable biodiversity, with around 10 million hectares lost to deforestation each year, mainly for agricultural expansion. Other threats include over-harvesting of timber, invasive species, climate change, desertification and forest fires.

Recommendations:

⮑ The report recommended various measures and actions that governments and development partners can take to facilitate the mainstreaming of biodiversity in forest management:

➢ Halting and reversing deforestation

➢ Combating illegal and unregulated forest activities

➢ Recognising the forest tenure of Indigenous Peoples and local communities

➢ Preventing the conversion of natural forests into monospecific forest plantations

➢ Ensuring the sustainable management of harvested species

➢ Managing and controlling invasive and overabundant species

➢ Leveraging global momentum on restoration to enhance biodiversity conservation

➢ Adopting a multisectoral perspective

➢ Providing economic incentives

➢ Facilitating market-based instruments

➢ Investing in knowledge and capacity development

Way Forward:

⮑ The involvement of Indigenous Peoples, local communities and the private sector in biodiversity management should be a priority and laws, policies and national strategies for biodiversity conservation should take into account forests other than protected areas.

AMASIA, THE NEW SUPERCONTINENT
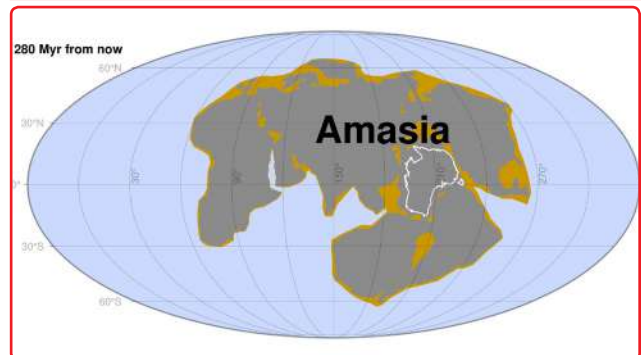
Why in news?

⮑ The Pacific Ocean is shrinking and as a result, Asia will crash into the Americas leading the way for one big supercontinent called 'Amasia'.

⮑ According to new research conducted at Australia's New Curtin University, scientists used a supercomputer to determine how the world will look once the supercontinent is formed.

⮑ Their calculations revealed that Amasia will be a combination of present-day American and Asian continents which will be formed 200 to 300 million years from now.

What is a supercontinent?

⮑ A supercontinent is one large landmass that is formed as a result of the convergence of several other existing continents.

⮑ The concept was first proposed by a scientist called Alfred Wegner, who tried to explain the idea behind

supercontinents in 1912. He included the concept in his theory of continental motion.

- Through his study, which was backed by new and old evidence, he tried to suggest that all the continents of Earth had once been part of a single body. He initially termed it as "Urkontinent".
- With the help of his theory, modern-day scientists are now able to study plate tectonics.
- Scientists suggest that in the past, at least seven supercontinents were known to be present on Earth.
- A supercontinent cycle occurs every 600 million years and during this process, it brings all continents of the world together.

Process involved:

- The supercontinents are formed by two processes, namely extroversion and introversion. During extroversion, the oceanic lithosphere surrounding the supercontinent is subducted – a geological process where a tectonic plate converges with a less dense lithosphere of a second plate.
- On the other hand, introversion begins when subduction zones are initiated along boundaries between the interior and exterior oceans.

What will Amasia be like?

- By simulating the Earth's tectonic plates using a supercomputer the team was able to show that in less than 300 million years' time the shrinking of the Pacific Ocean will make way for the formation of Amasia.
- The resulting new supercontinent has already been named Amasia because some believe that the Pacific Ocean will close (as opposed to the Atlantic and Indian oceans) when America collides with Asia. Australia is also expected to play a role in this important Earth event, first colliding with Asia and then connecting America and Asia once the Pacific Ocean closes.
- Amasia would form on the top of the Earth and would eventually slump south toward the equator. If this happens, Antarctica might remain isolated at the bottom of the world.
- The researchers have predicted that with the formation of Amasia, the planet can be expected to be drastically different from what it is now.
- The water levels in the seas will dip and the interiors of the supercontinent are expected to turn into arid regions. Apart from this, daily temperatures are also expected to have high ranges.

What are some other supercontinents?

- The oldest supercontinent called Columbia (Nuna), came together about 1.8 billion years ago.
- After Nuna broke apart, Rodinia formed about one billion years ago.
- The most recently found supercontinent is Pangaea, which came together about 300 million years ago.
- Columbia (Nuna) broke apart to form Rodinia through the process of inversion.

Why is the Pacific Ocean shrinking?

- The Pacific Ocean hosts a circle of subduction zones called the 'Ring of Fire', which is a 24,900-mile-long path along the ocean's edge, according to a report by World Atlas.
- The ocean is also home to about 75 per cent of the world's volcanoes and 95 per cent of all earthquakes happen there.
- The Pacific's mid-ocean ridge is a fast-spreading centre that spreads about three to six inches a year. However, the growth of the Pacific Ocean is slowed down due to the destruction of old crusts which is hindering the formation of new seafloor.
- Apart from this, the Atlantic Ocean is currently expanding and the expansion of another ocean is also causing Pacific to shrink.

MASS STRANDING ON NEW ZEALAND ISLANDS

Why in news?

- Nearly 500 pilot whales have died after beaching on New Zealand's remote Chatham Islands in two mass strandings over the weekend.

Details:

- As many as 250 pilot whales were found beached at Chatham Island, 840 kilometers east of the main South Island and three days later another 240 whales came ashore on Pitt Island.
- The stranded whales had to be euthanised as the Chatham Islands is far from the New Zealand mainland which makes it 'almost impossible' for rescue teams to reach in short notice.
- The conservation department does not try to refloat whales in the area due to the risk of shark attack to both humans and whales

What are mass strandings?

- When marine animals such as whales and dolphins wash ashore, the phenomenon is described as beaching or stranding.
- The most frequent mass strandings are visible in pilot whales.
- The other species that usually beach themselves include false killer whales, melon-headed whales, Cuvier's beaked whales and sperm whales.

⮑ All of these normally live in waters over 1,000 metres deep and are very social, forming cohesive groups that in some cases may number hundreds of animals.

Why does Whale Beaching happen?

⮑ Whale beaching is one of the most mysterious events in marine science, which is yet to be decoded by marine biologists.

⮑ Scientists speculate that the reason could be the sociable nature of whales and dolphins that live in colonies. They travel together in pods, often following a leader, and are known to gather around injured or distressed whales.

⮑ While some suspect it could be a misguided leader of the pack, others speculate a misadventure, where a few animals get themselves into trouble and the rest of the group might follow them.

⮑ Other researchers have also cited changes in electromagnetic fields in the region due to solar flares or seismic activity for the beachings.

⮑ The pilot whales use sophisticated sonar to find prey and for orientation, changes in the electromagnetic field could lead them in the wrong direction and away from the waters.

⮑ Another reason, specific to the island, could be the tides and the shape of the beaches, where if whales or dolphins are caught in the waters, they are bound to be pushed towards the shore and stranded.

⮑ A 2019 research indicates the eating pattern of the whales in the region. The analysis of stomach contents from 114 long-finned pilot whales stranded at four locations around Tasmania between 1992–2006 revealed that they were eating a variety of squid.

⮑ It indicated that the prey could have been closer to shore, drawing a few members towards the beach and the pod followed.

Man-made reasons:

⮑ Human activities may also be a reason for beaching.

⮑ Getting caught in fishing lines is the primary human-made cause of death for cetaceans.

⮑ Noise pollution, including sound pulses from the use of sonar and seismic surveys, interferes with whales' ability to communicate and navigate and can drive them ashore by deafening, disorienting, or frightening them.

⮑ In May 2000, a beaked whale mass stranding was reported in the Bahamas that coincided with a naval activity using loud mid-frequency sonar.

⮑ During the examination, haemorrhaging, mostly around the inner ear was found in some of these dead whales. Sonar can injure the ears of the whales as sound travels faster through water than air and its intensity is longer.

Some recent mass strandings:

⮑ While the October beaching event has killed over 400 pilot whales, a similar event happened in September when 230 whales were stranded on Tasmania's west coast in Australia.

⮑ Earlier, 14 sperm whales were discovered on King Island, part of the state of Tasmania in the Bass Strait between Melbourne and Tasmania's northern coast.

⮑ The largest mass stranding in modern recorded history happened in 1918 when 1,000 whales were stranded on the shores of the same Chatham Islands where the latest tragedy has happened.

⮑ Whales are a protected species, even once deceased, and it is an offense to interfere with a carcass.

FIRST WORLD SLOTH BEAR DAY

Why in news?

⮑ Recently, the first World Sloth Bear Day was observed on 12th October.

⮑ It aims to generate awareness and strengthen conservation efforts around the unique bear species endemic to the Indian subcontinent.

Status on IUCN List:

⮑ Classified as 'Vulnerable' on the IUCN Red List, sloth bears are endemic to the Indian sub-continent and 90% of the species population is found in India.

Background:

⮑ A proposal for observing the World Sloth Bear Day was mooted by Wildlife SOS India, an organisation involved in sloth bear conservation and protection for over two decades and the IUCN-Species Survival Commission sloth bear expert team accepted the proposal and declared the day to be celebrated worldwide.

About Sloth bears:

⮑ Sloth bears are identified by their very distinct long, shaggy dark brown or black fur, distinct white V-shaped chest patch and four-inch long ivory-coloured curved claws used for digging out termites and ants from rock-hard mounds.

- The sloth bears were omnivorous and survived on termites, ants and other social insects and fruits.
- They cannot eat meat and by foraging on fruits are the biggest seed dispersals.
- Listed under Schedule I of The (Wildlife Protection) Act of India, 1972 the species has the same level of protection as tigers, rhinos and elephants.

Habitat:

- There were eight species of bears across the world of which four were sloth bear, Himalayan black bear, brown bear and Malayan sun bear.
- The sloth bear (Melursus ursinus) was an important species and endemic to the Indian sub-continent with small populations in Nepal and Srilanka.
- Sloth bears are found in all parts of the country except Jammu and Kashmir and northeastern States. Over the past few years there has been a rise of incidents of human sloth bear conflict in States like Gujarat, Rajasthan and Maharashtra among other states.

Barbaric tradition being resolved:

- The Wildlife SOS has rescued and rehabilitated over hundreds of performing dancing bears, thereby resolving a 400-year-old barbaric tradition (of dancing bears) while also providing alternative livelihoods to the nomadic Kalandar community members .

E-WASTE ISSUE

Context:

- E-waste management has become a part of many national-level initiatives developed by the Indian government, such as Digital India, Swachh Bharat Mission and Smart Cities Mission.
- The success of these initiatives is also dependent on public awareness of proper e-waste management.. Yet, policymakers are concerned about the proper processing and management of e-waste that will be generated in the coming years.

IEWD:

- According to the recent Global E-waste Monitor Report 2020, India's e-waste production has increased nearly 2.5 times to 3.23 million metric tonnes in just six years.

- The problem has gained global attention, and as a result, every year on 14 October, the International E-Waste Day (IEWD) is observed to raise awareness of proper e-waste disposal and to promote reuse, recovery, and recycling rates.
- The primary focus of International E-waste Day in 2022 is on the Small Electrical Devices that we no longer use but store in cabinets and drawers or frequently throw in the regular trash.

Menace of small e-waste:

- The challenge of small, obsolete electrical and electronic appliances is extensive. Due to their diminutive size, products like cell phones, electric toothbrushes, toasters, and cameras are frequently thrown away improperly.
- As a result, they account for a sizable portion of the 8% of all e-waste that is thrown in waste bins and is subsequently landfilled or incinerated. As a result, they cannot be extracted and lose the valuable raw materials they contain.
- According to UN estimates, over 22 million tonnes of small e-waste was produced globally in 2019. This amounts to 40% of the 57 million tonnes of electronic waste generated worldwide.
- By 2030, there will be 29 million tonnes of this small item waste if it continues to grow at the same rate as all other e-waste (roughly 3% per year).

Global initiatives:

- The Waste Electrical and Electronic Equipment recycling (WEEE) Forum, a global organisation of e-waste collection schemes, created the day in 2018 with the help of its members.
- The WEEE Forum is an international association representing 46% Producer Responsibility Organisations (PRO's) across the globe.

Producer Responsibility Organisations (PRO):

- A European idea known as Producer Responsibility Organisations (PRO) transfers the producer's management of the waste to the PRO.
- A PRO manages the end-to-end operations related to waste management to increase competence, cost-effectiveness, and awareness. In order to ensure environmentally sound management of e-waste, PRO is defined as a professional organisation that has been authorised or financed jointly or separately by producers.
- PRO can assume responsibility for the collection and channelization of e-waste generated from the "end-of-life" of their products. It is because PRO handles collection, transportation, and recycling on behalf of the producers, it plays a critical role.
- The PRO systems adopted by developed countries (like Switzerland, Germany, Austria, Netherlands, and Scandinavian countries) could be the best systems but that doesn't mean there are no challenges faced by these countries.

➲ All such countries with best waste management and PRO systems are just able to rigorously adhere to the regulations formulated by their judicial system.

Initiatives in India:

➲ The idea of PRO is relatively new to the Indian manufacturing industry. According to the latest research, the formal authorisation process for PRO registration began in 2018 in India and the total number of PROs registered by 2021 for e-waste were 51.

➲ The Central Pollution Control Board (CPCB) has registered 74 PROs and 468 authorised dismantlers as of March 2022, with a total capacity for recycling of about 1.3 million tonnes.

➲ Recently the Ministry of Environment, Forest & Climate Change (MoEFCC) has released a draft notification on E-Waste (Management) Rules (2022) that eliminates both PROs and dismantlers and transfers more responsibility onto the shoulders of recycling companies (authorised recyclers)—of which India has very few. But the number of e-waste categories has increased from 21 to 95.

Way Forward:

➲ To tackle the problem there is an emergent need to strengthen the policy in the first place and then comes the implementation with stringent fines. Mass participation of all stakeholders is equally important in this.

➲ Strengthening the role of Urban Local Bodies in e-waste regulations can help tackle the problem at local level and they should be encouraged to frame their bye-laws to deal with the problem at each ward and zone level.

GRAZING ANIMALS KEY TO LONG-TERM SOIL CARBON STABILITY: IISC STUDY

Why in news?

➲ A study recent carried out by researchers at the Centre for Ecological Sciences (CES) and the Divecha Centre for Climate Change (DCCC), IISc, has revealed that grazing animals hold the key to long-term soil carbon stability.

Key Observations:

➲ The 16-year-long study states that large mammalian herbivores like the Yak and Ibex play a crucial role in stabilising the pool of soil carbon in grazing ecosystems such as the Spiti region in the Himalayas.

➲ Experimental removal of grazing by herbivores from such ecosystems was found to increase the fluctuations in the level of soil carbon, which can have unintended negative consequences for the global carbon cycle.

Reliable sink:

➲ The soil pool is a reliable sink for trapping carbon. Maintaining stable levels of carbon in the soil is therefore key to offsetting the effects of climate change.

➲ Since soil contains more carbon than all plants and the atmosphere combined, it is important to ensure its persistence. When plants and animals die, dead organic matter remains in the soil for a long duration before microbes break it down and release carbon into the atmosphere as carbon dioxide.

Fluctuations in soil carbon:

➲ From one year to the next, soil carbon was found to fluctuate 30-40% more in the fenced plots where animals were absent, compared to the grazed plots where it remained more stable each year. A key factor underlying these fluctuations was nitrogen.

➲ Depending on the soil conditions, nitrogen can either stabilise or destabilise the carbon pool. Grazing by herbivores, however, changes their interactions in ways that tip the balance in favour of the former.

➲ Many previous studies have focused on measuring carbon and nitrogen levels at long time intervals, assuming that the accumulation or loss of carbon is a slow process but the interannual fluctuations they noticed in their data paint a very different picture.

➲ These fluctuations can be consequential for climate as they are linked to how large mammalian herbivores influence soil.

Way Forward:

➲ As grazing ecosystems make up about 40% of the Earth's land surface, protecting the herbivores that keep the soil carbon stable should remain a key priority for mitigating climate change.

A NEW LEASE OF LIFE FOR CLIMATE ACTION

Context:

➲ Our world today is in turmoil, facing multiple, mutually reinforcing crises. For the first time since it began over 30 years ago, the United Nations Development Programme's Human Development Report has warned that global human development measures have declined across most countries in the past two years.

➲ This comes against the backdrop of the greatest existential threat of all; the triple planetary crisis of climate change, pollution and biodiversity loss.

Crisis of Climate change:

➲ Nine of the warmest years on record have come in the past decade alone. 2022's record-breaking heat waves, floods, droughts, and other extreme forms of weather have forced humans to face these increasingly devastating impacts.

➲ Climate change is a disruption multiplier in a disrupted world, rolling back progress across the global Sustainable Development Goals.

➲ The Paris Agreement and the COP26 summit in Glasgow represent urgent, collective steps countries are taking to limit emissions. Yet, the window for action is closing fast. Current Commitments will not keep warming below the 1.5°C target that gives the best chance of averting catastrophe.

People's participation:

➲ While governments and industry carry the lion's share of responsibility for responding to the crisis, consumers play a large role in driving unsustainable production methods.

➲ LIFE, or Lifestyle for Environment, announced by Prime Minister at COP26 in November 2021, brings a fresh and much-needed perspective.

How LIFE will work?

➲ Rather than framing climate change as a 'larger than life' challenge, LIFE recognises that small individual actions can tip the balance in the planet's favour. But people need guiding frameworks, information sharing and the scale of a global movement.

➲ Mindful choices cultivated by LIFE animate this spirit; actions such as saving energy at home; cycling and using public transport instead of driving; eating more plant-based foods and wasting less; and leveraging our position as customers and employees to demand climate-friendly choices.

➲ Many of the goals of LIFE can be achieved by deploying 'nudges', gentle persuasion techniques to encourage positive behaviour.

➲ The UN Environment Programme (UNEP) employs proven nudging techniques such as discouraging food waste by offering smaller plates in cafeterias; encouraging recycling by making bin lids eye-catching; and encouraging cycling by creating cycle paths.

➲ According to the UNEP, more than two-thirds of greenhouse gas emissions can be attributed to household consumption and lifestyles — the urgent cuts to global emissions we need can only be achieved through widespread adoption of greener consumption habits.

➲ And while LIFE is a global vision, India with over 1.3 billion people is an excellent place to start.

Pro Planet People:

➲ Indian PM together with UN Secretary-General António Guterres introduced the LIFE from the Statue of Unity in Gujarat.

➲ The Prime Minister and Secretary-General are calling on all consumers across the world to become "Pro Planet People" by 2027, adopting simple lifestyle changes that can collectively lead to transformational change.

➲ India has a proven track record translating the aspirations of national missions into whole-of-society efforts. The success of the Swachh Bharat Mission, which mobilised individuals and communities across socio-economic strata to become drivers of collective good health and sanitation is an example.

India's track record:

➲ The LIFE mission also recognises that accountability is relative to contribution.

➲ Emissions across the poorest half of the world's population combined still fall short of even 1% of the wealthiest.

➲ Those who consume the least, often the most vulnerable and marginalised members of society, will not be asked to consume less, but rather supported to participate in the green economy. Each 'Pro Planet' stakeholder is nudged according to differentiated approaches.

Onus on the developed world:

➲ LIFE resonates with the global climate justice, India has rightfully called for highlighting enhanced obligations those in developed countries bear, to support climate adaptation and mitigation for those most affected, yet least responsible.

➲ The average carbon footprint of a person in a high income country is more than 80 times higher than that of a person in a least developed country. It is common sense and only fair to call on the developed world to shoulder a proportionate share of this transition.

Way Forward:

➲ In the words of Mahatma Gandhi, "the world has enough for everyone's need, but not enough for everyone's greed." And there has never been a better time for India's leadership on climate action, at home and on the international stage.

➲ From the Panchamrit targets announced by Indian PM at COP26, to support for the International Solar Alliance, the Coalition for Disaster Resilient Infrastructure and South-South cooperation platforms, from the world's fifth largest economy with vibrant businesses making enormous investments in renewables and electric mobility, to a world class public digital tech stack, India brings scale, expertise and legitimacy; a well-positioned founding UN Member State bridging the G20 and G77.

HOW IS THE ENERGY CRISIS IN EUROPE SHAPING UP?

Context:
➲ As winter approaches, Europe faces an energy problem. The numerous leaks, apparently caused by explosions to the Nord Stream 1, which is an energy pipeline connecting Russia to Germany, has driven supplies to a halt.
➲ Amid anxieties about building up energy reserves, the gas field in Groningen in the Netherlands has once again come under the spotlight.

Why is this gas field relevant?
➲ The region of Groningen in the Netherlands has a gas field that began operations in 1963. During the 1980s, the area saw numerous earthquakes, minor enough to avoid large damage but big enough for local buildings to develop cracks. Following these quakes, the Dutch government had earlier said that it would shutter the field in response to local protests. The closure date was also advanced to 2022 from 2030.
➲ However, due to recent geopolitical tensions, the Dutch government wants to keep options open.
➲ A Bloomberg report said that if allowed, the additional supply from the field could go up to a level that would make up for what Germany imported last year from Russia. It said that the field still had potential for about 450 billion cubic metres (bcm) of gas to be extracted.

Can oil or gas exploration cause earthquakes?
➲ The man-made or induced earthquakes can be pretty damaging. Examples of human activity that could lead to 'induced seismicity' are damming of rivers to create reservoirs, oil or gas extraction, and mining.

➲ To enhance energy extraction, waste water, sand and chemicals are injected into the earth at high pressure to create fractures in the rocks. This process, called "hydraulic fracturing", helps improve the interconnectivity of the pores in order to enhance oil and gas extraction.

Injecting Fluid:
➲ In some cases, fluid is injected into pores connected to the fault which may substantially increase the pore pressure within the fault to counteract the effective frictional forces. This may trigger earthquakes.
➲ Also, fluid injection (water flooding) in a hydrocarbon reservoir (rocks that hold hydrocarbons which are oil and gas) is a common operation for the purpose of enhanced oil recovery.
➲ Water flooding through injection wells cause pore pressure in hydrocarbon reservoirs to increase, leading to decrease of effective normal stresses in reservoir rocks.
➲ Sometimes this decrease of effective stresses causes existing natural fractures to shift towards the window of critically stressed fractures leading to induced seismicity. A small fraction of these injection wells has induced earthquakes thus raising concerns.

Fluid extraction:
➲ Fluid extraction from hydrocarbon reservoirs causes an increase in net effective stresses, which, when supported by the geomechanics of the rock, may lead to development of new faults and fractures.
➲ In the case of Groningen, the ground subsiding has been caused by extraction alone over several years. Such extraction causes rocks to contract, as the pores get to hold less and less hydrocarbons over time.

Example of earthquake in Koynanagar, Maharashtra:
➲ A disastrous earthquake in Koynanagar, Maharashtra, of magnitude 6.5 occurred in Dec. 1967 which claimed at least 177 lives and injured more than 2,200.
➲ General consensus among seismologists was that it was due to reservoir-induced seismicity where the weight of the water column likely substantially altered the stress on an underlying fault / fracture resulting in an earthquake.

Don't major gas suppliers in the U.S. or Russia have such problems?
➲ There are several places in the U.S. where hydraulic fracturing has induced seismicity. The largest earthquake known to be induced by wastewater disposal was a M5.8 earthquake that occurred near Pawnee, Oklahoma (USA) in 2016.
➲ As per the United States Geological Survey, four earthquakes of magnitude 5+ have occurred in Oklahoma, three of which occurred in 2016. In 2011, a magnitude 5.3 earthquake was induced by fluid injection in the Raton Basin, Colorado.

⮡ Earthquakes caused by fluid extraction need not happen at every place that sees extraction. The geomechanical properties of the rock in question determine outcomes. The reaction of rocks to stresses can be different.

Should India be concerned about gas in the Netherlands?

⮡ India's domestic gas price is determined from the average of four global indices viz U.S.'s Henry Hub, the U.K.'s National Balancing point, Canada's Alberta and Russian gas.

⮡ Compared with pre-pandemic times, the average domestic price of gas has more than doubled from $5.08/MMBTU to $11.62 and this is bound to rise again when the six-monthly reset takes place for April-September 2023.

⮡ India consumed about 63.9 bcm in FY22, about 3.1 bcm more than in the previous year. Imports alone accounted for close to 50% of consumption, at about 30 bcm. Global production is estimated to decline from 4,109 bcm in calendar 2021 to 4,089 bcm in 2022.

⮡ The situation would become challenging for the government unless the formula for determining domestic gas price is reviewed, he says. Till then, the government has to bear the higher subsidy burden on fertilizer as well as for the LPG sector.

PLASTIC POLLUTION CONTINUES UNCHECKED IN INDIA

Why plastic pollution in Ind is still uncheck

Context:

⮡ On July 1, 2022 India banned the manufacture, import, stocking, distribution, sale, and use of identified single-use plastic items all across the country.

Items banned:

⮡ The elaborate list of banned items included plastic plates, cups, glasses, cutlery (such as forks, spoons, knives, straws, trays), stirrers, earbuds with plastic sticks, plastic sticks for balloons, plastic flags, candy sticks, ice-cream sticks, thermocol for decoration, wrapping films around sweet boxes, invitation cards, cigarette packets, and plastic or PVC banners less than 100 microns.

⮡ Even though the move was aimed at reducing the growing plastic pollution in the country, the July rule did not include packaging plastic in the list of banned products. What's more, companies were made responsible for recycling their plastic packaging waste under Extended Producer Responsibility (EPR).

What is Extended Producer Responsibility (EPR)?

⮡ On February 16, 2022, the central government published rules to amend Schedule II of Plastic Waste Management Rules, 2016. The EPR guidelines and its implementation were clearly spelt out in the new rules.

⮡ It was made clear that environmental compensation shall be levied on the polluters as per the Polluter Pays Principle if EPR targets are not met by producers, importers, and brand owners to improve the quality of the environment.

⮡ They had to compulsorily register through the online centralised portal and submit their action plan to the CPCB.

Concerns:

⮡ However, it is a cause for concern that only a negligible number are adhering to the EPR rule and few have registered on the online centralised portal. As a result, their activities remain unaccounted for. The CPCB and other departments concerned don't know how much plastic waste they are collecting, segregating, recycling and what their infrastructure is.

⮡ There's no information about the action plan and EPR targets of these plastic producers, importers, and brand owners. It is ironic that in a new notification in July 2022, the obligation to submit an action plan was actually scrapped. However, the EPR remained as before.

Shortcomings:

⮡ Interestingly, even though the EPR targets are laid down by the CPCB, they are based on voluntary disclosure by the plastic producers about the quantity or volume of plastic manufactured or imported. However, this is not happening since most of them are reluctant to make the disclosure publicly.

⮡ The rules have emphasised that entities involved in waste collection will hand over the waste for treatment and recycling or for identified end uses. Every company has to get a recycling certificate from its recycling partner.

⮡ Even though the EPR guidelines have prescribed a system of verification and audit of enterprises, it is almost like a paper tiger. Another lacuna stems from the fact that the producers or brands can buy credits if they fall short of EPR targets.

Non-recyclable plastics:

⮡ EPR includes rigid plastic packaging, flexible plastic packaging (single or multilayer), plastic sheets and

covers made of plastic sheet, carry bags, plastic sachets or pouches, multi-layered plastic packaging, and compostable plastic carry bags.

⮡ A whopping 3.5 million metric tonnes of plastic waste are generated in India annually, the Central Pollution Control Board (CPCB) Report (2019-20) had stated. It is estimated that 15.8 lakh tonnes per annum (TPA) of plastic waste was recycled and 1.67 lakh TPA was co-processed, which means 50 per cent of the total plastic waste produced is recycled.

⮡ All plastics, mostly multi-layered ones like shampoo sachets, chocolate wrappers, and chips packets can't be recycled. The multi-layered ones are mostly burnt, which causes another vicious form of air pollution.

Plastic demand:

⮡ In 2021-22, India's plastic demand was 20.89 million tonnes, which is projected to exceed 22 million tonnes by 2023, a Plastic Industry Status Report 2021 stated.

⮡ As many as 4,953 registered units are engaged with plastic in 30 States/Union territories in India, a report by CPCB said. There are 823 unregistered plastic manufacturing/recycling units in nine states/UTs.

Conclusion:

⮡ There is a robust informal sector, including the rag pickers, which carries out recycling in a big way. But non-recyclable plastic waste has no remedy. It has to be stopped at its very source. Until this is done, plastic pestilence will continue unabated.

COUNTRIES' TARGETS TO CUT GREENHOUSE GAS EMISSIONS INSUFFICIENT: UNFCCC

Why in news?

⮡ Recently, new Nationally Determined Contributions (NDC) Synthesis Report was released by the United Nations Framework Convention on Climate Change (UNFCCC).

Details:

⮡ The NDC pledged by countries to arrest climate change are insufficient.

⮡ Cumulative CO2 emissions in 2020-2030, based on the latest NDCs, would likely use up 86 per cent of the remaining carbon budget, according to the new NDC Synthesis Report.

What is NDC Synthesis Report?

⮡ The UNFCCC's synthesis report is an annual summary of climate commitments made by countries and their impact on global greenhouse gas (GHG) emissions.

⮡ These commitments known as Nationally Determined Contributions were made by countries who signed on to the Paris Agreement to address climate change.

⮡ The latest iteration of the report analyses 166 NDCs communicated to the UNFCCC as of September 2022. Some 39 countries have submitted new or updated NDCs since the previous report.

Marginal progress:

⮡ The emission levels resulting from a hypothetical implementation of the latest NDCs are about 5 per cent lower in 2030, compared to the report's previous edition.

⮡ The previous one projected emissions of 54.9 gigatonnes of carbon dioxide equivalent (GtCO2e) in 2030. If implemented, the latest NDCs would lead to 52.4 GtCO2e of GHGs in 2030. And the updated NDCs point to a stronger likelihood of global emissions peaking before 2030 than the previous report.

⮡ For the countries that have made their pledges more ambitious recently, the total GHG emissions will be about 10 per cent lower in 2030 than their previous NDCs.

Updated NDCs:

⮡ Updated NDCs are manifestations of the Paris Agreement's 'ratcheting mechanism'— wherein countries must revise their pledges to be more ambitious every five years.

⮡ The deadline was 2020. But inadequate ambition shown by the countries led to a decision at the 26th Conference of Parties (COP 26) to the UNFCCC to revise them again in 2022, with a cutoff date of September 23, 2022. Only 24 countries submitted new or updated NDCs after COP 26.

NDC by India:

⮡ India submitted its upwardly revised NDC in August, extending two of its previous NDC goals.

⮡ India now stands committed to reducing emissions intensity of its GDP by 45 per cent by 2030 from its 2005 levels, according to the updated NDC.

⮡ India will also target about 50 per cent of cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030.

Global emissions:

⮡ Global emissions must amount to only 31 GtCO2e in 2030 (43 per cent lower in 2030 compared to 2019) to meet the Paris Agreement's goal of limiting global temperature rise to 1.5 degrees celcius above pre-industrial levels, according to the IPCC.

⮡ Thus, world is on track to exceed this by more than 20 GtCO2e despite country commitments, assuming 52.4 GtCO2e emissions in 2030.

➲ Full implementation of all latest NDCs (including all conditional elements) is estimated to lead to a 3.6 (0.7-6.6) per cent emission reduction by 2030 relative to the 2019 level.

Conditional elements:

➲ Conditional elements refer to NDC targets that are subject to the availability of financial, technical and other forms of support, mainly in the case of developing countries.

➲ For example, India has made one of its new NDC targets conditional. The country will switch 50 per cent of its total power capacity to non-fossil sources by 2030. This pledge depends on the "transfer of technology and low-cost international finance, including Green Climate Fund (GCF)."

Carbon budget:

➲ According to the NDC Synthesis report, currently, world is on track for about 2.5°C of temperature rise by 2100, from a possible range of 2.1°C to 2.9°C.

➲ Most worrying is the impact on the carbon budget, a biophysical threshold of CO_2 that can be emitted to prevent global average temperatures from rising above a certain level.

➲ Carbon budgets are constructed on the premise that there is a near-linear relationship between rising global temperatures and the level of cumulative atmospheric CO_2.

➲ The world can emit only about 500 gigatonnes of carbon dioxide ($GtCO_2$) starting January 1, 2020, for a 50 per cent chance of limiting warming to 1.5°C.

➲ Cumulative CO_2 emissions in 2020–2030, based on the latest NDCs, would likely use up 86 per cent of the remaining carbon budget.

➲ Consequently, this leaves room to emit around 70 Gt CO_2 after 2030 to stay within the 1.5°C threshold equivalent to "approximately two years of projected total global CO_2 emissions by 2030".

➲ Breaching 1.5°C would lead to irreversible damage to vital planetary features such as the Greenland Ice Sheet, the west Antarctic Ice Sheet and tropical coral reefs. It can lead to more "floods, droughts, heat, disease, storms".

LT-LEDS:

➲ A second report published by the UNFCCC summarises 53 long-term emission reduction plans submitted by countries. These plans are known as long-term low-emission development strategies (LT-LEDS).

➲ These plans typically follow the announcement of a long-term target, such as net zero emissions by 2050 or 2070. Some 87 per cent of these plans communicated 2050 as a date along with a quantifiable long-term mitigation goal. Most NDCs (92 per cent) in the NDC Synthesis report are dated to 2030.

➲ LT-LEDS are typically broader in scope than NDCs and incorporate developmental goals as well as required levels of investment and government expenditure.

➲ The UNFCCC estimates the total emissions of countries who submitted LT-LEDS to be 10.8 GtCO2e, 68 per cent lower than 2019 levels. Alignment between NDCs and LT-LEDS is still unclear, only 8 per cent of countries mentioned that their NDCs are aligned with their LT-LEDS.

➲ But 40 per cent said that their LT-LEDS would guide the development and ambition of their subsequent NDCs. LT-LEDS can be useful to guide future low-carbon development, but the criticality of front-loading emission reductions in this decade cannot be overstated.

INDIA'S PER CAPITA GHG EMISSIONS FAR BELOW WORLD AVERAGE, SAYS UNEP REPORT

Why in news?

➲ The "Emissions Gap Report 2022: The Closing Window" was recently released by the United Nations Environment Programme.

➲ At 2.4 tCO2e (tonne carbon dioxide equivalent), India's per capita greenhouse gas emissions were far below the world average of 6.3 tCO2e in 2020.

Key Findings:

➲ It said the international community is still falling far short of the Paris goals, with no credible pathway to limiting global temperature rise to 1.5 degree Celsius in place.

➲ To address climate change, countries adopted the Paris Agreement in 2015 to limit global temperature rise in this century to well below 2 degrees Celsius, preferably to 1.5 degrees Celsius, compared to pre-industrial levels.

➲ World average per capita GHG emissions (including land use, land-use change, and forestry – LULUCF) were 6.3 tCO2e in 2020. The US remains far above this level at 14 tCO2e, followed by 13 tCO2e in the Russian Federation, 9.7 tCO2e in China, about 7.5 tCO2e in Brazil and Indonesia, and 7.2 tCO2e in the European Union.

➲ India remains far below the world average at 2.4 tCO2e. On average, least developed countries emit 2.3 tCO2e per capita annually.

Per capita emissions range widely across G20 members:

➲ Emissions of India are about half of the G20 average, whereas Saudi Arabia reaches more than twice the G20.

➲ India's contribution to historical cumulative CO_2 emissions (excluding LULUCF) is three per cent, whereas the US and the EU have contributed 25 per cent and 17 per cent respectively to total fossil CO_2 emissions from 1850 to 2019.

➲ China contributed 13 per cent, the Russian Federation seven per cent, and Indonesia and Brazil one per cent each. Least developed countries contributed only 0.5 per cent to historical CO_2 fossil fuel and industry emissions between 1850 and 2019.

Nationally Determined Contribution (NDCs):

➲ Despite a decision by all countries at the 2021 climate summit in Glasgow (UK) to strengthen nationally determined contribution (NDCs) and some updates from nations, progress has been "woefully inadequate".

➲ NDCs means national plans and pledges made by countries to limit global temperature rise to well below 2 degrees Celsius, preferably to 1.5 degrees Celsius.

➲ NDCs submitted this year take only 0.5 gigatonnes of CO_2 equivalent, less than one per cent, off the projected global emissions in 2030.

➲ Unconditional NDCs are estimated to give a 66 per cent chance of limiting global warming to about 2.6 degrees Celsius over the century. For conditional NDCs, those that are dependent on external support, this figure is reduced to 2.4 degrees Celsius.

➲ Current policies alone would lead to a 2.8 degrees Celsius hike, highlighting the temperature implications of the gap between promises and action, it said.

➲ In the best-case scenario, full implementation of unconditional NDCs and additional net-zero emissions commitments point to only a 1.8 degrees Celsius increase. However, this scenario is not currently credible based on the discrepancy between current emissions, short-term NDC targets and long-term net-zero targets.

Way Forward:

➲ To meet the Paris Agreement goals, the world needs to reduce greenhouse gases by unprecedented levels over the next eight years.

➲ Unconditional and conditional NDCs are estimated to reduce global emissions in 2030 by five and 10 per cent respectively, compared with emissions based on policies currently in place.

➲ To get on a least-cost pathway to holding global warming to 1.5 degree Celsius, emissions must fall by 45 per cent over those envisaged under current policies by 2030. For the two degrees Celsius target, a 30 per cent cut is needed.

<div style="text-align:center; background:red; color:white;">**SOCIAL ISSUES**</div>

SECONDARY EDUCATION CAN REDUCE CHILD MARRIAGE BY 66%: UNICEF

Why in news?

➲ According to a UNICEF report, the prevalence of child marriage is decreasing globally.

➲ The most progress in the past decade was seen in South Asia, where a girl's risk of marrying in childhood dropped by more than a third to below 30 per cent.

➲ Still, the total number of girls married in childhood stands at 12 million per year.

Issue of Child marriage:

➲ Child marriage refers to any formal marriage or informal union between a child under the age of 18.

➲ It is a violation of human rights that limits girls in reaching their full potential. This harmful practice is closely associated with deprivations in education, health, access to resources and empowerment.

➲ The United Nations Sustainable Development Goals call for global action to end this human rights violation by 2030.

Prevalence in Africa:

➲ Incidences of child marriage was the highest in West and Central Africa, where nearly 4 in 10 young women were married off before 18 years of age.

➲ Lower levels of child marriage are found in Eastern and Southern Africa (32 per cent), South Asia (28 per cent) and Latin America and Caribbean (21 per cent).

➲ More than 100 million additional adolescent girls will marry by 2030 if efforts to curb the menace are not ramped up.

➲ In the regions of Ethiopia worst affected by the drought, child marriage has on average more than doubled in a year as of June 2022.

➲ The number of children at risk of dropping out of school across Ethiopia, Kenya and Somalia due to the impact of the crisis tripled within three months.

Role of Secondary education:

- Keeping girls in school is the best way to ensure they get married at a later age. Secondary education is a much stronger and more consistent protection against child marriage than primary school education.
- In many countries, marriage and schooling are viewed as incompatible and decisions about removing a girl from school and marrying her off at a young age are often made at the same time.
- These decisions are influenced by the perceived value of education and the availability of employment opportunities for educated girls.
- Better quality of education and higher literacy rates among women is directly linked to lower cases of child marriage.

Challenges:

- Girls from poor, rural, conflict- and crisis-hit areas and marginalised groups will not progress to secondary education unless they have quality primary education.
- Also, barriers in the transition to secondary education, such as school fees, distance to school, safety also need to be reduced.
- The issue of child marriage has been addressed in a number of international conventions and agreements.
- In 2016, UNICEF, along with United Nations Population Fund, launched a global programme to tackle child marriage in 12 of the most high-prevalence or high-burden countries: Bangladesh, Burkina Faso, Ethiopia, Ghana, India, Mozambique, Nepal, Niger, Sierra Leone, Uganda, Yemen and Zambia.

Way Forward:

- Progress on SDG 5.3 (eliminating child marriage) is dependent on progress in other areas, especially education, employment and poverty reduction.
- The global target is to eliminate child marriage practice by 2030. But reaching this goal would require coordinated action and additional investment.
- To end child marriage by 2030, progress must be 17 times faster than the progress of the last decade.

ELDERLY POPULATION OF INDIA

Why in news?

- The United Nations marks today as International Day for Older Persons (October 1), as part of the organisation's efforts to draw attention to healthy ageing.
- The theme for the International Day of Older Persons is "Resilience of Older Persons in a Changing World".

Demographic change:

- Recently, a report by the UN Department of Economic and Social Affairs (UNDESA), "World Population Prospects 2022", has projected big shifts in global demographic patterns in the coming decades.

- As global birth rates stabilise and shrink, 16% of the world population by 2050 is expected to be made up of people over 65 years.

Decadal growth in elderly population compared to that of general population

Population Census Data, Report of the Technical Group on Population Projections November 2019, Population. Projections for India and States 2011-2036, Census of India 2011
Source: MOSPI
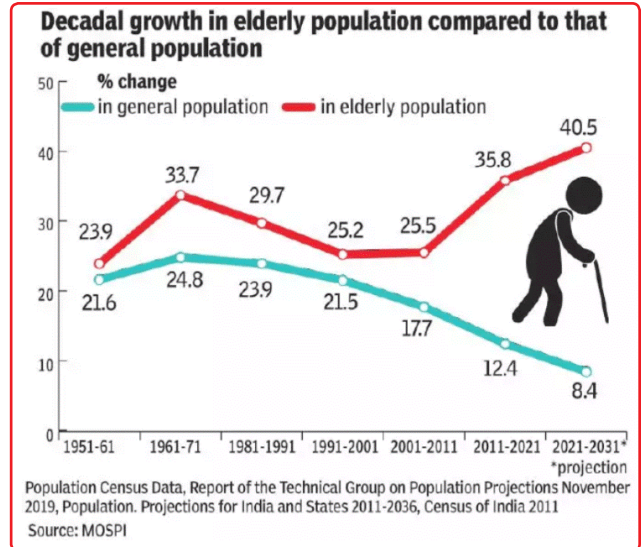
- The "World Population Prospects 2022" report estimates that by 2050, the global population will be 9.7 billion people. By then, those older than 65 years will be twice as many as children under five. That year is also projected to be a pivotal year for India's population too.

Ageing population & pressure on public health systems:

- The report projects India's population to be 1.7 billion by 2050, having overtaken China to be the world's most populous country. Eight countries including India will account for more than half of the world's increasing population by 2050.
- Previous United Nations reports have projected that the proportion of India's elderly population will double to be nearly 20% of the total population by that year.
- The prevalence of non-communicable diseases such as diabetes, hypertension and heart disease, or disabilities related to vision, hearing or mobility is higher among the elderly.
- The change in demographic structure will increase the pressure on public health systems that are not geared to deliver universal health care along with social security measures such as old-age and disability pensions.

Case study on Eye care and elderly health:

- The Hyderabad Ocular Morbidity in the Elderly Study (HOMES) by the L.V. Prasad Eye Institute has been producing a series of systematic reports on various aspects of health, quality of life, mental health, morbidity, and disability amongst the elderly living in homes-for-the-aged in Hyderabad, Telangana.
- Using eye care as a point of entry, the study has been measuring a variety of health and social metrics

in over 1,000 participants (all aged over 60), spread across a range of socio-economic circumstances.

➲ Over 30% of the elderly in the study had distance vision loss and over 50% had near vision impairment (they needed reading glasses).

➲ Nearly half the participants had at least one disability and a third of them had multiple morbidities. About 70% of them were using at least one assistive device, spectacles being the most common.

Issues linked with vision impairment:

➲ The study also explored the many links between vision impairment and an elderly person's mental health and confidence.

➲ People with impaired vision had a greater fear, and risk, of falling (a major cause of disability and hospitalisation among the elderly).

➲ This reduced their movement and independence, leading to depression. Addressing their vision impairment improved lives.

Suggestions:

➲ The first step towards tackling basic issues of access and confidence in the elderly is to address vision loss. Eye examinations are also good opportunities to assess and recognise other systemic issues in the elderly.

➲ The way forward can then be a package of interventions, including assistive devices for sight, hearing, and mobility, or referrals to psychiatric support for depression or other mental health issues. In this way, eye care can catalyse a model of elderly care that will help us recalibrate our approach to this changing world.

➲ Most eye conditions typically affect those who are very young or the elderly, age groups that are dependent on others for health access. Therefore, the Indian eye care model has always prioritised primary care 'vision' centres, bringing care closer to those in need.

➲ Chronic conditions such as diabetes and hypertension lead to irreversible vision loss and so, the sector has been building referral networks connecting with other health specialities.

A perspective:

➲ Eye care has also been at the cutting edge of imaging technologies and tele-health, creating portable devices and apps that remove access issues for those who cannot travel far.

➲ Crucially, eye health in India has many cross-subsidy models to help alleviate the financial burden on individuals.

Way Forward:

➲ The future of elderly care needs to be long term, comprehensive, and integrated, and must be oriented towards primary care to be accessible.

➲ It must account for all kinds of socio-economic realities, working to ensure that no elderly person is denied care irrespective of their financial status.

➲ A comprehensive eye examination can be the first step towards enabling such a healthy and happy future for our elderly citizens.

CONTROVERSY SURROUNDING THE GLOBAL HUNGER INDEX

Why in news?

➲ For the second time in two years, the Ministry of Women and Child Development rejected the Global Hunger Index (GHI) that ranked India 107 among 121 countries.

➲ India was accorded a score of 29.1 out of 100 (with 0 representing no hunger), placing it behind Sri Lanka (66), Myanmar (71), Nepal (81) and Bangladesh (84).

➲ It referred to the index as "an erroneous measure of hunger". It also wrongly claimed that the Index relied on an opinion poll.

What is the Global Hunger Index?

➲ The GHI, is a peer-reviewed annual report that endeavours to "comprehensively measure and track hunger at the global, regional, and country levels".

➲ It is jointly-produced by the Germany-based not-for-profit organisation Welthungerhilfe and Ireland-based Concern Worldwide.

➲ Authors of the report primarily refer to the United Nations' Sustainable Development Goal 2 (SDG 2) that endeavours to achieve 'Zero Hunger' by 2030. According to them, the report attempts to "raise awareness and understanding of the struggle against hunger".

➲ The inaugural report was first published in 2006. The 2022 report is its 17th edition.

Indicators:

➲ The GHI score is computed using four broad indicators:
 a) undernourishment (measure of the proportion of the population facing chronic deficiency of dietary energy intake),
 b) child stunting (low height for age),
 c) child wasting (low weight for height) and
 d) child mortality (death of a child under the age of five).

Basic terminologies:

➲ Hunger refers to the undesirable sensation caused by insufficient consumption of calories on a daily basis to lead a normal and healthy life, taking into account her/his age, sex, stature and physical activity.

➲ Undernutrition is the result of inadequate intake of food, which could be in terms of either quantity or qality, poor utilisation of nutrients due to infections or other illnesses. It could emanate from varied social or economic factors.

➲ The U.S. Food and Agriculture Organisation (FAO) defines 'malnutrition' is defined as the abnormal physical condition caused by unbalanced or excessive intake of macronutrients and/or micronutrients. Imperative to understand here is chronic undernourishment is synonymous with hunger and undernutrition is a type of malnutrition.

Why these four metrics?

➲ Undernourishment, as per the authors, provides a basis to measure inadequate access to food and is among the lead indicators for international hunger targets, including the UN SDG 2.

➲ Child stunting and mortality, offers perspective about the child's vulnerability to nutritional deficiencies, access to food and quality of nutrition.

➲ Since children (especially below five) are at a developmental age there is a greater and urgent requirement for nutrition with results particularly visible. This forms the basis of assessing nutritional requirement among children. Adults are at a sustainable age, they are not growing but rather subsisting on nutrition for healthy survival.

➲ And lastly, on the same rationale, child mortality indicates the serious consequences of hunger. Children are most vulnerable to hunger and thus any potential deficiency (of vitamins and minerals) is better captured.

What allegations are we looking at?

➲ As per the Ministry for Women and Child Development, the report lowers India's rank based on the estimates of the Proportion of Undernourished (PoU) population.

➲ It elaborates that the U.S. Food and Agriculture Organisation (FAO) estimate is based on the 'Food Insecurity Experience Scale (FIES)' survey module conducted using the Gallup World Poll that bears a sample size of 3,000 respondents being asked eight questions.

➲ It stated that the data represented a miniscule proportion for a country of India's size. It countered the assertions in the report pointing to India's per capita dietary energy supply increasing year-on-year due to enhanced production of major agricultural commodities in the country over the years.

➲ While FAO uses a suite of indicators on food security, including two important indicators, the GHI only uses the PoU obtained through food balance sheets based on data reported by member countries, including India.

➲ A food balance sheet provides a comprehensive picture of the pattern of a country's food supply during a specified reference period. It lists down the source of the supply and its utilisation specific to each food category.

Why the GHI uses three child-specific indicators out of the four to calculate hunger for a country's population?

➲ By combining the proportion of undernourished in the population (1/3 of the GHI score) with the indicators relating to children under age five (2/3 of the GHI score), the GHI ensures that both the food supply situation of the population as a whole and the effects of inadequate nutrition within a particularly vulnerable subset of the population are captured.

➲ All four indicators used in the calculation of the global hunger are recognised by the international community, including India, and used for measuring progress towards the UN SDGs.

Why the controversy?

➲ According to the Ministry, the report is not only disconnected from ground reality but also chooses to deliberately ignore the food security efforts of the Central government especially during the pandemic.

➲ The Union Cabinet through the Pradhan Mantri Garib Kalyan Ann Yojna (PM-GKAY), provisioned an additional five kg ration per person each month in addition to their normal quota of foodgrains as per the National Food Security Act. It was recently extended to December 2022.

Concerns:

➲ The schemes definitely helped ease the situation but fell short of being adequate.

➲ However, given the unemployment, prices of food increasing and stagnant wage-levels, people are not eating what they should eat.

➲ The pandemic-induced distress only added to an existing dimension and made it worse.

NUMBER OF POOR PEOPLE IN INDIA FELL BY ABOUT 415 MILLION BETWEEN 2005-06 AND 2019-21: UN

Why in news?

➲ The number of poor people in India fell by about 415 million between 2005-06 and 2019-21, a historic change according to the UN.

Details:

➲ The new Multidimensional Poverty Index (MPI) released by the United Nations Development Programme (UNDP) and the Oxford Poverty and Human Development Initiative (OPHI) at the

University of Oxford said that in India, 415 million people exited poverty between 2005/06 and 2019/21.

➲ It demonstrates that the 'Sustainable Development Goal' target 1.2 of reducing at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions by 2030 is possible to achieve and at scale.

Key Highlights:

➲ The report said based on 2020 population data for India, it has by far the largest number of poor people worldwide (228.9 million), followed by Nigeria (96.7 million projected in 2020).

➲ Despite progress, India's population remains vulnerable to the mounting effects of the COVID-19 pandemic and to rising food and energy prices. Integrated policies tackling the ongoing nutritional and energy crises should be a priority.

➲ Despite tremendous gains, the ongoing task of ending poverty for the 228.9 million poor people in 2019/2021 is daunting especially as the number has nearly certainly risen since the data were collected.

➲ While poverty among children fell faster in absolute terms, India still has the highest number of poor children in the world (97 million, or 21.8 per cent of children ages 017 in India).

Global scenario:

➲ The report said across 111 countries, 1.2 billion people 19.1 per cent live in acute multidimensional poverty. Half of these people, 593 million are children under age 18. The analysis looks at the most common deprivation profiles across 111 developing countries.

➲ The most common profile, affecting 3.9 per cent of poor people, includes deprivations in exactly four indicators: nutrition, cooking fuel, sanitation and housing. More than 45.5 million poor people are deprived in only these four indicators.

➲ Of those people, 34.4 million live in India, 2.1 million in Bangladesh and 1.9 million in Pakistan making this a predominantly South Asian profile.

Reduction in Multidimensional Poverty Index (MPI) value in India:

➲ In some countries, subnational regions that were initially among the poorest in their country reduced

poverty faster in absolute terms than the national average, narrowing the poverty gap. These include Bihar, Jharkhand and Uttar Pradesh in India (2015/2016 2019/2021).

➲ The reduction in Multidimensional Poverty Index (MPI) value in India was swift across the two most recent periods. Of the nearly 415 million people who exited poverty in India in the 15 years prior to the COVID-19 pandemic, roughly 275 million did so between 2005/2006 and 2015/2016 and 140 million did so between 2015/2016 and 2019/2021.

➲ The 2019-2021 data show that about 16.4 per cent of India's population live in poverty, with an average intensity of 42 per cent. About 4.2 per cent of the population live in severe poverty.

➲ About 18.7 per cent of people, roughly the same proportion as in 2015-2016, are vulnerable to poverty because their deprivation score ranges from 20 per cent to 33 per cent. Two-thirds of these people live in a household in which at least one person is deprived in nutrition a worrying statistic,.

➲ The percentage of people who are poor is 21.2 per cent in rural areas compared with 5.5 per cent in urban areas. Rural areas account for nearly 90 per cent of poor people: 205 million of the nearly 229 million poor people live in rural areas making them a clear priority.

Poverty in female-headed households:

➲ India is the only country in South Asia in which poverty is significantly more prevalent among female-headed households than among male-headed households.

➲ About 19.7 per cent of people living in female-headed households live in poverty compared with 15.9 per cent in male-headed households.

➲ One in seven households is a female-headed household, so around 39 million poor people live in a household headed by a woman.

State wise trend:

➲ Across states and union territories in India, the fastest reduction in relative terms was in Goa, followed by Jammu and Kashmir, Andhra Pradesh, Chhattisgarh and Rajasthan.

➲ In relative terms the poorest states have not caught up. Of the 10 poorest states in 2015/2016, only one (West Bengal) was not among the 10 poorest in 2019/2021. The rest Bihar, Jharkhand, Meghalaya, Madhya Pradesh, Uttar Pradesh, Assam, Odisha, Chhattisgarh and Rajasthan remain among the 10 poorest.

➲ The pace and patterns of MPI reduction in India vary across states and union territories. While additional analysis is needed to clarify the drivers of change in each context, it is clear that multiple policy actions and schemes underpin these results.

Way Forward:

- There have been visible investments in boosting access to sanitation, cooking fuel and electricity indicators that have seen large improvements.
- A policy emphasis on universal coverage for example, in education, nutrition, water, sanitation, employment and housing likely contributed to these results.

SCIENCE & TECHNOLOGY

5G SERVICES LAUNCHED

Why in news?

- Recently, the Prime Minister launched 5G services at the sixth edition of the India Mobile Congress at New Delhi's Pragati Maidan.
- 5G services will roll out in 13 cities first. The list includes: Delhi, Mumbai, Chennai, Kolkata, Bengaluru, Chandigarh, Gurugram, Hyderabad, Lucknow, Pune, Gandhinagar, Ahmedabad and Jamnagar.

What is 5G?

- 5G or fifth generation is the latest upgrade in the long-term evolution (LTE) mobile broadband networks.
- 5G is a global wireless network expected to deliver ultra-low latency (the delay users face as data make a round trip), increased reliability, more network capacity and availability.
- 5G services deliver up to 20 GBPS, or gigabytes per second, peak data transfer speeds and 100+ MBPS, or megabytes per second, on average.
- 5G has a latency that is below 5 milliseconds as compared to 60 to 98 ms of 4G. This alone would revolutionise the application of AI, ML and IoT services. Latency is the amount of time data takes to travel between its source and destination.

How does it work?

- 5G works in three bands: low, mid and high frequency spectrum.

Low band spectrum:

- While the low band spectrum has shown great promise in terms of coverage and speed of internet and data exchange, the maximum speed is limited to 100 Mbps (Megabits per second).

- This means that while telcos can use and install it for commercial cellphone users who may not have specific demands for very high speed internet, the low band spectrum may not be optimal for specialised needs of the industry.

Mid-band spectrum:

- The mid-band spectrum, on the other hand, offers higher speeds compared to the low band, but has limitations in terms of coverage area and penetration of signals. Telcos and companies, which have taken the lead on 5G, have indicated that this band may be used by industries and specialised factory units for building captive networks that can be moulded into the needs of that particular industry.

High-band spectrum:

- The high-band spectrum offers the highest speed of all the three bands, but has extremely limited coverage and signal penetration strength.
- Internet speeds in the high-band spectrum of 5G has been tested to be as high as 20 Gbps (giga bits per second), while, in most cases, the maximum internet data speed in 4G has been recorded at 1 Gbps.

Operators in India:

- There are a few operators that will provide 5G services to its customers. Reliance Jio, which was the top spender at 2020's 5G spectrum auctions bidding an amount of more than Rs 88,000 crore, said in August that it will roll out high-speed mobile internet services on its 5G network by Diwali.
- Bharti Airtel which was the second highest spender in the auction has said that 5G will be available on its network in all urban parts of the country by the end of 2023.
- Vodafone Idea (VI) is also working hard to launch its 5G service soon.

Challenges in rolling out 5G:

- 5G will require a fundamental change to the core architecture of the communication system. The major flaw of data transfer using 5G is that it can't carry data over longer distances. Hence, even 5G technology needs to be augmented to enable infrastructure.
- For transition from 4G to 5G technology, one has to upgrade to the latest cellular technology, thereby creating financial liability on consumers.

Why is it important?

- It is designed in such a way that it also supports new services such as mission-critical communications and the massive IoT (Internet of things).
- Eighty crore subscribers have access to broadband today compared to ten crore subscribers in 2014.
- The upcoming 5G services have the potential to create new age businesses, generate additional revenue for enterprises and provide employment arising from the deployment of innovative use-cases and technologies.

Controversies over 5G:

- ➲ In January, travel plans of thousands of passengers were disrupted after several airlines cancelled flights to and from the US over the deployment of 5G.
- ➲ The aviation industry warned 5G signals over new C-band networks could interfere with aircraft safety equipment, causing jetliners to tumble from the sky or speed off the end of runways.
- ➲ Verizon and AT&T agreed not to turn on more than 600 5G transmission towers near the runways of 87 airports and to reduce the power of others.

Health concerns:

- ➲ Experts have dismissed any health concerns for consumers. The possible side-effects of 5G are the same as 4G, 3G, 2G, Wi-Fi; all these wireless communication technologies use EM waveform that radiates energy.
- ➲ Tissue heating is the main mechanism of interaction between radiofrequency fields and the human body. Radiofrequency exposure levels from current technologies result in negligible temperature rise in the human body.
- ➲ As the frequency increases, there is less penetration into the body tissues and absorption of the energy becomes more confined to the surface of the body (skin and eye). Provided that the overall exposure remains below international guidelines, no consequences for public health are anticipated.

Way Forward:

- ➲ It is hoped that 5G or fifth generation mobile network services will cover the entire country over the next couple of years and will unleash a completely new bunch of economic, industrial and societal benefits.

2022 NOBEL PRIZE IN MEDICINE ON HUMAN EVOLUTION

Why in news?

- ➲ The 2022 Nobel Prize for Physiology or Medicine has been awarded to Swedish geneticist Svante Pääbo for his research in the field of genomes of extinct hominins and human evolution.
- ➲ Dr. Pääbo's research has resulted in the rise of a new scientific disciple called paleogenomics, which is the study and analysis of genes of ancient or extinct organisms.

Ancient gene flow:

- ➲ Dr. Pääbo's groundbreaking research attempts to answer questions about human evolution. He was able to sequence the genome of Neanderthal, a species of humans that existed on the earth and went extinct around 30,000 years ago.
- ➲ He also discovered Denisova, a previously-unknown hominin. Hominins are extinct members of the human lineage.
- ➲ His research led him to the conclusion that "gene transfer had occurred from these now extinct hominins to Homo sapiens following the migration out of Africa around 70,000 years ago".
- ➲ This ancient gene flow has significant physiological relevance for present-day humans.

Neanderthal genome sequence:

- ➲ Neanderthals, the closest relatives of the present-day human species, lived in Europe and West Asia, as far as southern Siberia and Middle East, before they disappeared around 30,000 years ago.
- ➲ Over time, DNA tends to degrade and become chemically modified. Since Neanderthals became extinct 30,000 years ago, only trace amounts of their DNA would have been left in fossils, if any.
- ➲ He was appointed as a professor at the University of Munich in 1990, where he continued his research to study DNA from extinct human species. This was when he decided to study mitochondrial DNA from Neanderthals.
- ➲ Mitochondria, popularly called the powerhouse of the cell, is an organelle inside the cell that has its own DNA. Although the mitochondrial genome is small and only contains a fraction of genetic information in the cell, it is present in thousands of copies. This increases the chance of its successful sequencing.
- ➲ The geneticist was successful in sequencing a part of mitochondrial DNA from a 40,000-year-old bone. A comparison of this with contemporary humans and chimpanzees showed that Neanderthals were genetically distinct. In 2010, he published the first Neanderthal genome sequence.

Observations from genome sequence of Neanderthal:

- ➲ DNA sequences from Neanderthals were also found to be more similar to sequences from contemporary humans originating from Europe or Asia than to contemporary humans originating from Africa, suggesting interbreeding between Neanderthals and Homo sapiens during their coexistence.
- ➲ It was noted that the divergence of the Neanderthal genome to the human reference genome was greater than for any of the present-day human genomes that had been analysed.

⮑ The Neanderthal genome allows researchers to identify features that are unique to present-day humans, relative to other hominins.

Denisova Genome sequence:

⮑ In 2008, he sequenced the DNA from an "exceptionally well-preserved", 40,000-year-old fragment from a finger bone found in the Denisova cave in Siberia.

⮑ This DNA sequence turned out to be unique, different from all-known sequences from Neanderthals and present-day humans. The previously-unknown hominin Denisova was thus discovered.

Significance of the research:

⮑ His conceptual breakthrough is of paramount importance in understanding human evolution, but at the same time, his technological breakthrough deserves equal praise. It is not easy to amplify and sequence ancient DNA because it is highly fragmented and full of contamination from microbes like fungi and bacteria.

⮑ The research has helped in furthering the recognition of evolutionary biology and paleogenomics. This is a hard field to follow, especially in places like India and Africa because the ancient DNA is not preserved well in tropical weather conditions.

⮑ It remains to be seen if the renewed interest in the field will lead to better funding and subsequently more opportunities for researchers.

PALAEOGENOMICS & HUMAN ORIGINS

Context:

⮑ The Nobel Prize for Physiology 2022 has been awarded to Svante Pääbo, Swedish geneticist, who pioneered the field of palaeogenomics, or the study of ancient hominins by extracting their DNA.

What is the significance of Pääbo's work?

⮑ Pääbo is the Director of the Max Planck Institute of Evolutionary Anthropology in Leipzig, Germany and has, over three decades, uniquely threaded three scientific disciplines: palaeontology, genomics and evolution.

⮑ The study of ancient humans has historically been limited to analysing their bone and objects around them such as weapons, utensils, tools and dwellings. He pioneered the use of DNA, the genetic blueprint present in all life, to examine questions about the relatedness of various ancient human species.

⮑ He proved that Neanderthals, a cousin of the human species that evolved 1,00,000 years before humans, interbred with people and a fraction of their genes, about 1-4% live on in those of European and Asian ancestry.

⮑ Later on, after analysing a 40,000-year-old finger bone from a Siberian cave, proved that it belonged to a new species of hominin called Denisova. This was the first time that a new species had been discovered based on DNA analysis and this species too had lived and interbred with humans.

How can DNA be extracted from fossils?

⮑ The challenge with extracting DNA from fossils is that it degrades fairly quickly and there is little usable material. Because such bones may have passed through several hands, the chances of it being contaminated by human as well as other bacterial DNA get higher. This has been one of the major stumbling blocks to analysing DNA from fossils.

⮑ One of his early forays was extracting DNA from a 2,500-year-old Egyptian mummy and while it caused a stir and helped his career, much later in life he said that the mummy-DNA was likely contaminated.

⮑ DNA is concentrated in two different compartments within the cell: the nucleus and mitochondria, the latter being the powerhouse of the cell.

⮑ Nuclear DNA stores most of the genetic information, while the much smaller mitochondrial genome is present in thousands of copies and therefore more retrievable.

First Neanderthal genome:

⮑ In 1990, he took the call to analyse DNA from Neanderthal mitochondria. With his techniques, he managed to sequence a region of mitochondrial DNA from a 40,000-year-old piece of bone. This was the first time a genome from an extinct human relative was pieced together.

⮑ Subsequently, he managed to extract enough nuclear DNA from Neanderthal bones to publish the first Neanderthal genome sequence in 2010. This was significant considering that the first complete human genome was published only in 2003.

What has Pääbo's work shown?

⮑ His most important contribution is demonstrating that ancient DNA can be reliably extracted, analysed and compared with that of other humans and primates to examine what parts of our DNA make one distinctly human or Neanderthal.

⮑ Due to his work, it is known that Europeans and Asians carry anywhere between 1%-4% of Neanderthal DNA and there is almost no Neanderthal DNA in those of purely African ancestry. Comparative analyses with the human genome demonstrated that the most recent common ancestor of Neanderthals and Homo sapiens lived around 8,00,000 years ago.

⮑ In 2008, a 40,000 year-old fragment from a finger-bone, sourced from a Siberian cave in a region called Denisova, yielded DNA that was from an entirely new species of hominin called Denisova.

⮑ Further analysis showed that they too had interbred with humans and that 6% of human genomes in parts of South East Asia are of Denisovan ancestry.

What are the implications of palaeogenomics?

⮑ The study of ancient DNA provides an independent way to test theories of evolution and the relatedness of population groups.

Indus Valley civilization:

➲ In 2018, an analysis of DNA extracted from skeletons at Haryana's Rakhigarhi, reported to be a prominent Indus Valley civilisation site provoked an old debate about the indigenousness of ancient Indian population. These fossils, about 4,500 years old, have better preserved DNA than those analysed in Pääbo's labs as they are about 10-times younger.

➲ The Rakhigarhi fossils showed that these Harappan denizens lacked ancestry from Central Asians or Iranian Farmers and stoked a debate on whether this proved or disproved 'Aryan migration.'

Diseases:

➲ Palaeogenomics also gives clues into disease. Researchers have analysed dental fossils to glean insights on dental infections.

➲ Genome-wide association studies, where segments of DNA from species are compared, have found that Neanderthal DNA may be linked with autoimmune diseases, type 2 diabetes, and prostate cancer.

➲ A study co-authored by Svante Pääbo and Hugo Zeberg linked an increased risk of severe respiratory failure following COVID-19 with a set of genes that are inherited from Neanderthals and is present in 50% of South Asians and 16% of Europeans.

➲ However, with respect to the current pandemic, it is clear that gene flow from Neanderthals has tragic consequences.

➲ The presence of Neanderthal and Denisovan DNA in people also raised questions on whether there are hard genetic distinctions between people and their extinct evolutionary cousins.

HOW IS 'CLICK CHEMISTRY' MORE ENERGY EFFICIENT?

Context:

➲ A trio of chemists, Carolyn Bertozzi, Morten Meldal and Barry Sharpless won Nobel laureates 2022 for Chemistry.

➲ They won it for pioneering 'click chemistry', which underpins green chemistry.

What is click chemistry?

➲ A big part of what chemists do is making new molecules, which is as much an art as it is science.

Standard approach:

➲ The standard approach is to mimic nature. In the early 20th century, finding nitrogen in a form usable by plants, despite it being the most abundant element in the atmosphere, was one of the discoveries scientists were striving hard to achieve.

➲ German chemist, Fritz Haber cracked the code for ammonia, which combined nitrogen and hydrogen that plants could synthesise for nitrogen, and Carl Bosch figured out a way to produce it in massive amounts.
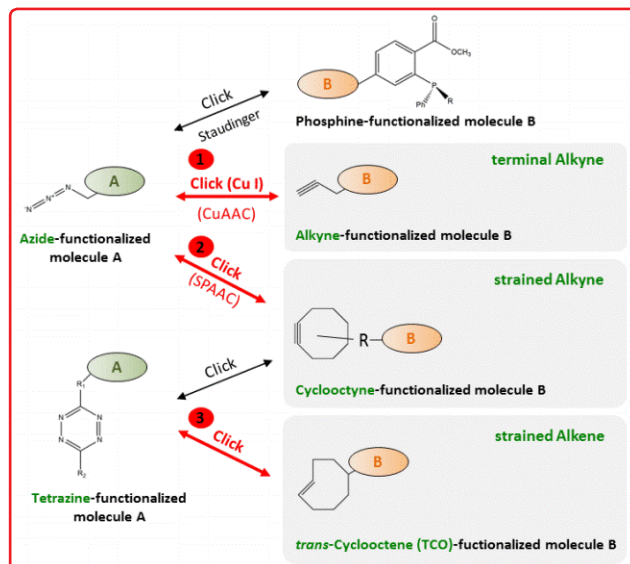
➲ The Haber-Bosch process is still the dominant way of producing cheap fertilizer and is at the heart of industrialised agriculture. However, this process is extremely energy intensive and polluting and the modern-day challenge is to therefore produce so-called 'green ammonia'.

➲ This principle extends to most synthetic chemicals, where scientists try to create a natural substance, in a way that is different from the usual method which is often circuitous and creates several unwanted toxic by-products.

Synthetic chemicals:

➲ Shortly after winning his first Nobel Prize in 2001, Sharpless began discussing ways to synthesise chemicals that were efficient and not wasteful. To be able to create new pharmaceuticals, Sharpless argued, chemists ought to be moving away from trying to make 'natural' molecules and creating new ones in simpler ways that did the job.

➲ As an example, he said, it was hard to coax carbon atoms from different molecules to link to each other. Instead, why not take smaller molecules, which already have a complete carbon frame and link them using bridges of nitrogen atoms or oxygen atoms? Sure, it wouldn't be as elegantly constructed as the natural stuff but would be efficient, greener and useful.

➲ This Lego-block like approach to making new molecules is the essence of 'click chemistry.' The 'click' is from an analogy he drew from seatbelts clicking snugly into buckles.

How did click chemistry come into being?

➲ For a chemical reaction to be called click chemistry, it has to occur in the presence of oxygen and in water, which is a cheap and environmentally friendly solvent. While Sharpless gave examples of existing reactions that were potentially 'click worthy',

the actual breakthrough came in a Copenhagen laboratory.

➲ This reaction, the copper catalysed azide-alkyne cycloaddition has now become almost synonymous with click chemistry.

➲ Azides and alkynes are different chemical groups that don't combine naturally but can do so in the presence of copper ions. Meldal who was tinkering with some routine reactions in his Copenhagen laboratory, discovered that these two had combined to form a third kind of chemical structure called triazole.

➲ These are stable structures found in certain drugs and agricultural chemicals. Earlier attempts to make triazoles were inefficient and created undesirable by-products but copper changed the game.

➲ Sharpless and Meldal had independently discovered this out of the U.S. and Denmark respectively. Manufacturers can now add a clickable azide to a plastic or fibre and modify it to be able to conduct electricity or make them waterproof by adding an alkyne.

What is Bertozzi's contribution?

➲ Click chemistry as envisaged by Meldal and Sharpless applies to the non-living world. However, Bertozzi began investigating glycans, which are complex carbohydrates that play an important role in many biological processes, such as when the immune system is activated.

➲ Bertozzi wanted to study a particular kind of glycan that attached itself to the lymph nodes but the problem was tracking its presence in the body. She figured out a way, again using an azide, to attach a fluorescent molecule onto sialic acid,a constituent of glycans.

➲ However, since copper is toxic to cells, Bertozzi used click chemistry to make a product that avoided it, paving the way for making biomolecules that can be used to track diseases and corresponding cell processes.

➲ Researchers have now begun to make clickable antibodies to target a range of tumours. Once the antibodies attach to the tumour, a second molecule that clicks to the antibody is injected which can monitor its growth or even deliver a dose of radiation.

CHERNOBYL NUCLEAR DISASTER SPAWNS 'MUTANT FROGS'

Why in news?

➲ 36 years since a catastrophic meltdown at the Chernobyl power plant unleashed one of the world's worst nuclear disasters, now 'mutant' black frogs are spawning in the vicinity.

Details:

➲ The species of frog found in this area, known as the Eastern tree frogs (Hyla Orientalis) typically have

bright green skin but now many have sprung up with dark or pigmented skin.

➲ Scientists believe that darker skin might help the frogs survive in the exclusion zone.

Highlights of the research:

➲ The melanin protects from the damage caused by different types of radiation, from UV to ionizing radiation – the kind at Chernobyl.

➲ They collected more than 200 male frog specimens from about a dozen different breeding ponds with varying levels of radiation between 2017 and 2019.

Observations:

➲ The frogs in the exclusion zone which spans 10,000 square miles around ground zero were much darker than those outside it.

➲ However, the most radioactive locations today did not correlate with the darkest frog populations. Although darker frogs were most prominent in the areas that were worst affected at the time of the catastrophe.

➲ Darker frogs would have had a higher chance of surviving the 1986 calamity, which means that natural selection of the fittest might've helped them thrive, and dominate the exclusion zone.

➲ Over time – 10 to 12 generations of frogs have passed since the accident – this would have resulted in these black frogs being predominant within the exclusion zone.

Way Forward:

➲ The researchers added that further study is needed to determine the underlying mechanisms and evolutionary consequences of the patterns found here.

2022 PHYSICS NOBEL & QUANTUM ENTANGLEMENT

Context:

➲ The Nobel Prize 2022 in Physics was awarded in the field of quantum mechanics to John F. Clauser, Alain Aspect and Anton Zeilinger.

➲ They have been awarded for experiments with entangled photons, establishing the violation of Bell inequalities and pioneering quantum information science.
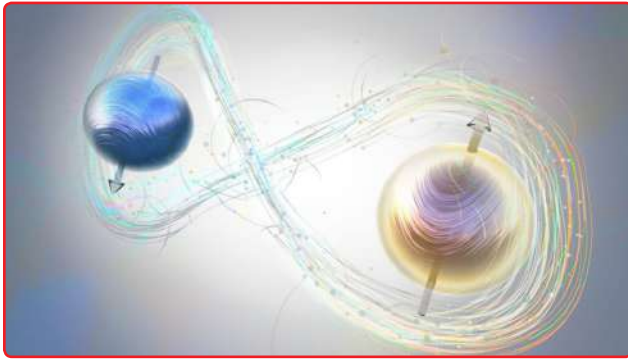
Why were these three physicists chosen for the award?

➲ The prize has been given for experimental work in quantum entanglement, which Einstein referred to as 'spooky action at a distance'.

➲ John Clauser and Alain Aspect firmed up this concept, developing more and more complex experiments that demonstrated and established that entanglement was indeed a true characteristic of quantum mechanics. They did this by creating, processing and measuring what are called Bell pairs.

➲ Anton Zeilinger innovatively used entanglement and Bell pairs, both in research and in applications. These include quantum computation and quantum cryptography.

What is at the centre of the quantum revolution?

➲ Many of the concepts that were useful in visualising the movement of particles in the classical realm break down when applied to particles obeying quantum mechanics.

➲ For example, when a tennis ball is struck, it traces out a definite path in space. The path it traces out is called a trajectory, and it is eminently possible to theoretically calculate the trajectory to any given accuracy.

➲ Simultaneously, there is no restriction on measuring the speed, or momentum of the ball at every point on the trajectory. Particles that fall into the quantum regime on the other hand; electrons or photons, for example do not even possess a definite trajectory because they are not little hard spheres that we initially imagined them to be, but are weird, wavelike quantum objects.

➲ Because of this, there is a limit to how precisely you can measure the position and momentum of these particles simultaneously. Many differences arise, starting from this fundamental difference.

➲ One important difference in the behaviour of quantum systems, when compared to classical bodies, is the concept of entanglement.

What is the practical use of quantum mechanics?

➲ Electronic devices employed today use transistors that apply quantum mechanical ideas.

➲ Lasers have been built that apply the quantum properties of light.

What is quantum entanglement? Does it have a classical counterpart?

➲ Quantum entanglement is a phenomenon by which a pair of particles, say photons, is allowed to exist in a shared state where they have complementary properties, such that by measuring the properties of one particle, you automatically know the properties of the other particle. This is true however far apart the two particles are, provided the entanglement is not broken.

➲ There is a trivial example of this from the classical domain. Take two coloured balls, one black and one white, and put them in identical boxes so that no one other than you know which box contains the black ball.

➲ One of the boxes is sent to Vienna and the other to Madurai. Just by opening the box they have received, the person in Vienna (or Madurai) can know not only the colour of the ball they have received but also that of the one in Madurai (or Vienna). This is a classical example and is somewhat trivial because nothing more can be made of it.

➲ If the ball obeys quantum mechanics, its colour is not known to the observer until he or she makes an observation. So, until the box is opened, the state of the ball inside is a superposition of black and white states.

➲ Like the absence of a well-defined trajectory described earlier, this is one of the features of quantum mechanics. If the two balls occupy a shared state to start with, which is possible in quantum mechanics, however far the two may be transported, because of entanglement, opening one box can tell the user what the other ball's colour is. Until one box is opened, the two balls exist in a superposition of colours.

Bell's inequalities:

➲ Bell's inequalities are theoretical insights that make it possible to differentiate between two scenarios. One, that the indeterminacy of the colour of the balls is purely a quantum phenomenon, and the other, that there are hidden variables that determine the colour when opened.

What was the work done by the laureates?

➲ John Clauser and Alain Aspect devised sophisticated experiments to test the above cases and establish through Bell's inequality, that entanglement was indeed a consequence of quantum physics.

➲ The third laureate Anton Zeilinger and his group used the phenomenon of entanglement to perform what is called quantum teleportation.

➲ This is a way of conveying information from one place to another without the actual transport of material.

Where does the work find use in practical applications?

➲ The work of the three laureates can help in developing quantum technologies of the future, for example, quantum cryptography, and precise timekeeping as is done in atomic clocks.

3-DOSE HEPATITIS B VACCINE FULLY PROTECTS HIV POSITIVE ADULTS: STUDY

Why in news?

➲ Three doses of HEPLISAV-B vaccine provide full protection to adults with HIV, who were never immunised against hepatitis B virus (HBV) either through vaccination or infection, according to a study.

Research on HEPLISAV-B

➲ The researchers from University of Cincinnati and Cornell University tested the three-dose course of HEPLISAV-B among 68 adults living with HIV at 38 sites in the US, South Africa, and Thailand.

➲ None of the participants had either received a previous HBV vaccination or had evidence of a previous HBV infection. Retroviruses are a group of viruses that contain two single-strand linear RNA molecules per virion, or a viral particle, and reverse transcriptase (RNA to DNA).

➲ Following the initial dose of HEPLISAV-B vaccine 0.5 milliliter (mL) as an intramuscular injection, the study participants received additional doses at four weeks and 24 weeks.

➲ The objective of this part of the study was to assess anti-HBV surface antibodies (HBsAbs) greater than or equal to 10 milli-international units per milliliter (mIU/mL) at week 28, defined as seroprotection, or protection in the blood serum, from HBV, and to assess the vaccine's safety.

Outcome:

➲ All participants achieved seroprotection with 88 per cent of them achieving HbsAb levels greater than 1000 mIU/mL. High antibody levels are associated with long-term vaccine durability.

➲ At eight weeks after the second dose, 94.4 per cent of participants achieved seroprotection, which increased to 98.5 per cent by week 24 prior to the third dose, according to the researchers.

➲ The most common side effects related to vaccination were injection site pain, malaise, fatigue, muscle aches and headaches.

Hepatitis B virus (HBV):

➲ HBV is spread primarily through sexual contact and sharing of contaminated needles. It causes chronic hepatitis B infection and can lead to progressive liver disease.

➲ People living with HIV, including those who are taking antiretroviral therapy, are at a greater risk of liver-related illness and death when co-infected with HBV.

➲ According to the Centers for Disease Control and Prevention, 10 per cent of U.S. adults with HIV also have hepatitis B. People living with HIV are less likely to produce a protective immunological response to HBV vaccination.

HEPLISAV-B vaccine:

➲ The HEPLISAV-B vaccine, made by the California-based Dynavax Technologies, was approved in 2017 by the U.S. Food and Drug Administration as a two-dose vaccine regimen for adults. However, little was known about its protective effects in people living with HIV.

THE HEAVINESS OF ROCKETS, WHY IT MATTERS IN SPACE FLIGHT

Why in news?

➲ Recently, the Indian Space Research Organisation (ISRO) crossed an important milestone with the successful launch of the LVM3 M2/OneWeb India-1 mission.

➲ The LVM3 rocket carried almost 6 tonnes of payload into lower-earth orbit, the most that any ISRO mission has delivered into space till date.

Why it matters?

➲ The success of the flight not only re-validated the viability of the LVM3 rocket, ISRO's most advanced launch vehicle, for keenly-awaited missions like the Gaganyaan, but also affirmed the agency's claim as a serious player in the heavy satellite launch market.

- Very few countries have the capability to launch satellites weighing more than 2 tonnes. Until recently, even ISRO used to take the services of Ariane rockets of Europe to launch its heavy satellites.
- The LVM3 rocket, which used to be called GSLV Mk-III earlier, is meant to end that dependence, and also become the vehicle for the more ambitious parts of India's space programmes in the near future.

India's rockets:

- India currently has three operational launch vehicles:
  a) The Polar Satellite Launch Vehicle or PSLV, of which there are multiple versions;
  b) The Geosynchronous Satellite Launch Vehicle or GSLV Mk-II; and
  c) The Launch Vehicle Mark-3 or LVM3.
- The PSLV has been the most commonly used, having carried as many as 53 successful missions since 1993. Only two flights of PSLV have failed.
- The GSLV-MkII rocket has been used in 14 missions, of which four have ended in failures, most recently in August last year. The LVM3 has flown five times, including the Chandrayaan 2 mission, and has never disappointed.
- In addition, ISRO has been working on a reusable launch vehicle (RLV). Unlike other rockets, the RLV would not end up in space as waste. Instead, it can be brought back and refurbished for use multiple times.

Heavier rockets:

- LVM3 is the culmination of more than three decades of efforts to indigenously develop a rocket that can carry heavier payloads, or venture much deeper into space. These requirements not only result in a massive increase in the size of the rocket, but also necessitate a change in the engines and the kind of fuel being used.
- Compared to vehicles that ply on land, or even on water, rockets are an extremely inefficient medium of transport. The passenger (or payload) comprises barely 2 to 4 per cent of the weight of the rocket.
- Between 80 and 90 per cent of the launch-time weight of any space mission is the fuel, or the propellant. This is because of the unique nature of a space journey, which involves overcoming the tremendous force of gravity.
- The LMV3 rocket, for example, has a lift-off mass of 640 tonnes, and all it can carry to lower earth orbits (LEO), about 200 km from the Earth's surface is a mere 8 tonnes.
- To the Geostationary Transfer Orbits (GTO) that lie farther ahead, up to about 35,000 km from Earth, it can carry much less, only about 4 tonnes. However, the LMV3 is not particularly weak when compared to the rockets being used by other countries or space companies for similar jobs.
- The Ariane 5 rockets, frequently used by ISRO earlier for its heavy payloads, has a lift-off mass of 780 tonnes, and can carry 20-tonne payloads to lower earth orbits and 10 tonnes to GTO.
- The Falcon Heavy rockets from SpaceX, supposed to be the most powerful modern launch vehicles, weigh over 1,400 tonnes at launch time, and can carry payloads weighing only about 60 tonnes.
- The PSLV has been the most commonly used, having carried as many as 53 successful missions since 1993. Only two flights of PSLV have failed.

Challenges:

- The size of a launch vehicle is dictated by the destination in space it is headed towards, the kind of fuel; solid, liquid, cryogenic, mix that is being used, and the size of the payload. The choice of any two of these variables places severe restrictions on the flexibility of the third, a predicament that is popularly referred to as the "tyranny of the rocket equation" in the space community.
- Not surprisingly, most of a rocket's energy is burnt in travelling to the lower earth orbit. This is because the force of gravity is the strongest here. The journey farther into space is much more smooth, and requires far less energy.
- In fact, it takes half as much energy for a rocket to travel to the Moon from the LEO (a journey of nearly 4 lakh km) compared to what it takes to travel to LEO from Earth (about 200 km). It is for this reason that it is often said that the giant leap for mankind was not setting foot on the Moon, but in reaching the LEO.
- If a space mission is headed towards the Moon or Mars or any other celestial body, the gravity of the destination also enters the equation. More energy would be expended in reaching such a destination, compared to simply attaining a space orbit to deposit a satellite.
- The efficiency of the fuel being used is the other constraint on the flight of the rocket. Several chemicals are used as rocket fuels. They deliver different thrusts. Most modern-day rockets use multiple sets of fuels to power the different stages of the flight to optimise the results.
- The LMV3, for example, has solid fuels in the boosters which provide additional thrust during liftoff, a liquid stage, and a cryogenic stage.

Engineering ingenuity:

- With dreams of setting up a permanent station on the Moon, and taking human beings to Mars and beyond, rockets would need to carry more and more stuff to space. But the capacity of rockets is severely limited.
- There are two kinds of engineering innovations that can be employed to fulfill the objectives of future missions. The rockets can make multiple trips, carrying components of larger structures that can be assembled in space. This is how the International Space Station and other similar facilities were built.

➲ The other is the possibility of the use of resources available in situ on the Moon and Mars. In fact, all future missions to the Moon are attuned to exploring this possibility.

THE TECHNOLOGY, WATER AND SECURITY NEXUS

Context:

➲ From low-cost desalination to hand-held purifying filters, technology has revolutionised access to clean drinking water and improved livelihoods across the globe. Technology has also aided in enabling better infrastructure, reducing loss, and creating a more secure environment.

➲ As the global population grows, especially in urban centres, and resources dwindle, it has become even more important to increase the water sector's sustainability and resilience; being water smart, creating more with what we have, and wasting less.

Caution:

➲ Working with companies and people that bring the best of innovation in technology, artificial intelligence (AI), the internet of things (IoT), robotics, and new frontiers in computing can enable better management of growing water insecurity.

➲ However, as these two spaces merge and blur, there is need to be mindful that the extent of dependency on technology does not distract from behaviour and patterns of use.

➲ And, above all, as with many other spaces of innovation and science, there is need to ensure that any over dependence on technology and systems does not become a security threat.

Water insecurity:

➲ Water insecurity is a very real challenge to human and environmental security across all measures.

➲ While access to clean water is one of the largest hurdles, insecurity also stems from a range of issues, including dwindling groundwater, stress on water bodies, unsustainable development and theft, amongst others.

➲ Changes in the climate and ecosystems are added cause and effect of water insecurity.

➲ About a third of the global population lives without access to clean water and the United Nations' Sustainable Development Goals for 2030 set a high bar to ensure safe and affordable drinking water for all by the end of the decade.

➲ It will not be easy, especially in Asia, where approximately 300 million people in the region do not have access to safe drinking water, and close to 80 percent of wastewater generated by cities is discharged untreated into water bodies.

Intersection of technology & water security:

➲ While ambitious, these goals can be met through a better understanding of how water plays a pivotal role not only in human, food, and health security, but also in protecting ecosystems, growth ambitions, energy needs, and mitigating climate change. In practical terms, the intersection of technology and water security is an important avenue in achieving these goals.

➲ Emerging technology can be effectively utilised and optimised to make access to water and managing water systems more efficient. It also aids in smarter predictions and forecasting.

➲ There are numerous ways to harness technology, innovation, and the drive to create and aid water solutions that can ultimately also prevent conflict over shared resources.

Fourth Industrial Revolution:

➲ The emerging fourth industrial revolution offers untapped possibilities on understanding water. In 2021, a joint satellite mission between NASA and France, the Surface Ocean Topography Mission, was launched to use radar technology to provide a global survey of Earth's water.

➲ The satellite will study lakes, rivers, reservoirs, and the oceans, potentially adding a wealth of knowledge to previously unknown data to understand, measure, and manage our water resources.

➲ Such knowledge is not only about understanding our waters better, but it is also incredibly useful in understanding the effects of development on our resources and the more nuanced effects of changes in weather and climate, ultimately feeding into better policy making.

Smart metering:

➲ Smart metering uses IoT sensors installed at critical junctures along infrastructure to alert users on water levels, quality, theft, and leakages. Primarily used in large scale systems, these can be introduced at the household and community level, including new housing complexes that are being built in growing cities across India.

➲ Not only can such a system create better awareness and understanding in domestic use patterns to allow for better policy making, it also ensures that the citizen

has a role and responsibility in the sustainability of water cycles.

➲ Such sensors can also improve water quality, as unexpected or dangerous chemical levels can be spotted and dealt with immediately. The data collected by these devices can subsequently be analysed by AI algorithms to predict seasons when there might be chemical spikes that can be pre-emptively treated, especially in communities that share water bodies and water systems with industry.

Other Smart ideas:

➲ Innovation in this space is countless, from water ATMs to fit-for-purpose wastewater solutions to underwater drones with sensors for pipes and drains.

➲ In Bhubaneshwar, researchers at the Council of Scientific and Industrial Research are using burnt red clay to treat raw water and make it potable; and in central India, low cost fit-for-purpose wastewater solutions developed by ECOSOFTT are being used to treat pollution in the Narmada River. The interconnectedness between various users and better governance is endless.

Collaborative approach:

➲ As the dangerous trio of climate change, unsustainable development, and dwindling water resources hinder human and environmental security, the trio of science, emerging technology, and innovation need to be brought closer together in the water sector.

➲ Better public-private partnerships with substantial investment allows for targeted forecasting and tools that can predict potential conflict zones.

➲ The last annual report by the Indian Meteorological Department stated that not only was 2021 the fifth warmest year since 1901, 2012-2021 was the warmest decade on record. A rise in temperatures can have cascading effects on weather events, urban transformation, agricultural output, health, and energy security. Such events can fuel existing tensions and become risk multipliers.

➲ AI and machine learning can map and predict potential risks, and early warning tools can aid in tracking water supplies, the effects of changes in the weather patterns, and potential disruptions that can occur.

➲ It is a step forward in understanding conflict and engaging in dialogue and cooperation measures early on. A transformation in thought, analysis, and implementation is necessary to be able to counter known and, more importantly, some of the unknown risks and effects of a warming planet.

Challenges ahead:

➲ Undoubtedly, there are limitations and challenges to the extensive use of technology including regulatory frameworks, lack of skill, the inability of existing infrastructure to support such innovation, financial

obstacles, and high energy consumption, amongst others.

➲ Often, new environmental and water-related technology and the use of AI or machines are met with suspicion and are seen as a challenge to cultural traditions, especially if local communities are not suitably sensitised.

➲ Adoption requires a wider approach, with upgraded infrastructure, a range of new technical skills, new governance frameworks, education, and effective management. These are not insurmountable challenges and can be overcome through political will, forward-looking institutions and policies, and significant public-private partnerships.

➲ There is also the added risk that comes with the use of technology, such as cyberattacks that are used as threats on critical infrastructure, utilities and businesses, affecting consumers and causing significant financial loss.

➲ 'Hacktivism' is a growing concern and interconnected grids, dams, treatment plants, and other infrastructure all become vulnerable.

Way Forward:

➲ Overdependence on technology cannot and should not replace human responsibility on how water is seen, understood and used; there is no substitute for education to ensure that we are no longer wasteful.

➲ The other aspect is ensuring that we use any emerging technology, innovation, and science mindfully with smart policies and global governance systems in place that provide us with security but also safeguards the water itself.

➲ While some technology has been a part of water conversation for decades, it is still a new area of collaboration. Ultimately, there is no substitute for the beautiful rivers and lakes and other water bodies we depend on.

CULTURE

MAHAKAL LOK CORRIDOR IN UJJAIN

Why in news?

➲ Recently, the Prime Minister inaugurated the Mahakal Lok corridor at Ujjain in Madhya Pradesh.

➲ The total project cost of the more than 900 metres long corridor is Rs 856 crore with the first phase costing Rs 351 crore.

Details:

➲ The corridor, said to be one of the longest in the country, traverses the old Rudrasagar lake which has been revived as part of the redevelopment project around the Mahakaleshwar Temple, one of the 12 'jyotirlingas'.

➲ The Mahakaleshwar Temple is dedicated to Lord Shiva and assumes importance as it houses one of the 12 Jyotirlingas in India. A jyotirlinga is a representation of Lord Shiva in Hinduism.

➲ The entire premises will be kept under vigil 24*7 by Integrated Command and Control Centre with the help of artificial intelligence and CCTV cameras.

➲ Two majestic gateways — `Nandi Dwar' and `Pinaki Dwar' — separated by a short distance have been erected near the starting point of the corridor which winds its way to the temple's entrance.

108 pillars:

➲ Measuring more than 900 metres in length, the corridor will have around 108 aesthetically ornate pillars made of intricately carved sandstones that depict the Anand Tandav Swaroop (a form of dance of Lord Shiva), 200 statues and murals of Lord Shiva and goddess Shakti. It will also house other religious art.

➲ There are 93 Shiva statues from the main door to the temple, depicting stories from Shiv Puran. Each statue/mural has a QR code. Scan the code, and get all the information about it.

Rudrasagar Lake:

➲ With the project, heritage structures will also be restored. Among them is the Rudrasagar Lake, which will be revived and conserved.

➲ A massive clean-up will be undertaken to ensure that the ponds water level and quality is maintained. As many as 152 buildings have been acquired to connect Mahakal Temple with Kshipra River.

Decongestion:

➲ The project also aims to ease congestion in the area, by restricting entry of vehicles into the Mahakal Lok area. The plan envisages expanding the temple precinct by seven times.

➲ It will provide decentralised parking locations at all entry points.

➲ Convenience shops, accommodation, emergency facilities, e-vehicles and solar parking are also there to facilitate the tourists.

Phase II:

➲ Under phase-II, many areas like Maharajwada, Mahakal Gate and old route, Rudrasagar, Hari Phaatak bridge, Ramghat facade, musical fountain in Rudrasagar, Begum Bagh road, emergency entry and exit of Mahakal Temple will be spruced up.

➲ A Kumbh Museum will also be developed.

➲ A garden is to be developed between the old pedestrian walkway from Mahakal Temple to Ramghat. There will be motorable light and sound shows at the famous Ramghat along Kshipra River.

LOTHAL SET TO GET NATIONAL MARITIME HERITAGE COMPLEX

Why in news?

➲ World's oldest dockyard, Lothal, is all set to get heritage complex as Prime Minister reviewed the construction of the National Maritime Heritage Complex (NMHC) site via video conferencing.

➲ Lothal was not only a major trading centre of the Indus Valley Civilisation, but was also a symbol of maritime power and prosperity of India. With NMHC, Lothal will act as a centre for learning and understanding India's maritime history.

Where is Lothal situated?

➲ It is one of the southernmost sites of the Indus Valley Civilisation, situated in the Bhal region in the present-day Gujarat.

➲ Said to be built in 2,200 BC, this port city was a thriving trade centre in ancient times with its trade of beads, gems and ornaments reaching West Asia and Africa.

➲ The word 'Lothal' is a combination of Loth and thal, meaning the mound of the dead in Gujarati.

➲ The port city was discovered after a team of archaeologists led by SR Rao started the search for Harappan civilisation post 1947 in the Saurashtra region.

➲ According to Archaeological Survey of India (ASI), Lothal had the world's earliest known dock, connecting the city to an ancient course of the Sabarmati river.

The ongoing project:

➲ The National Maritime Heritage Complex commenced in March 2022 and is being developed at a cost of Rs 3,500 crore.

➲ The complex will have several innovative features, including the i-recreation, which will recreate Harappan architecture and lifestyle through immersive technology and four theme parks.

- It will also house the world's tallest lighthouse museum, along with 14 galleries, highlighting India's maritime heritage starting from the Harappan time till today.

Significance of Lothal:

- In 2014, Lothal was nominated as a UNESCO World Heritage Site, however, its application is still pending.
- Its heritage value is comparable to many other ancient port-towns around the world, which includes - Xel Ha (Peru), Ostia (Port of Rome) and Carthage (Port of Tunis) in Italy, Hepu in China, Canopus in Egypt, Gabel (Byblos of the Phoenicians), Jaffa in Israel, Ur in Mesopotamia, Hoi An in Vietnam.
- In the region, it can be compared with other Indus port towns of Balakot (Pakistan), Khirasa (in Gujarat's Kutch) and Kuntasi (in Rajkot).
- According to the dossier submitted to UNESCO, the excavated site of Lothal is the only port-town of the Indus Valley Civilisation.

World's largest museum of Harappan culture in Rakigarhi:

- Earlier in September, Haryana Chief Minister urged the ASI to expedite the excavation in another Harappan Civilisation site, Rakhigarhi.
- The Haryana govt planned to develop the world's largest museum of Harappan culture in Rakhigarhi to showcase about 5,000-year-old Indus Valley artifacts.
- During the preliminary excavations, a cluster of seven mounds marked as RGR 1 to RGR 7 were found which together formed the largest settlements of the Harappan civilization.
- In 1963, the ASI for the first time started excavation in a village. Between 1998 and 2001, the ASI team led by Amarendra Nath again started excavation.
- In 2013, 2016 and 2022, another excavation work led by V. S. Shinde, former Vice-Chancellor of Deccan University, Pune, was done.
- Fifty-six skeletons have been found in Rakhigarhi since 1998. Of these, 36 were discovered by Shinde and his team. The skeletons of two women found in the excavation of mound number 7 are about 7,000 years old.

MISCELLANEOUS

NOBEL PEACE PRIZE 2022

Why in news?

- The 2022 Nobel Peace Prize has been jointly awarded to Belarusian human rights advocate Ales Bialiatski, the Russian human rights organisation Memorial, and the Ukrainian human rights organisation Centre for Civil Liberties.
- The award was announced by the Norwegian Nobel Committee in Oslo

THE NOBEL PEACE PRIZE 2022

Illustrations: Niklas Elmehed

Ales Bialiatski　　Memorial　　Center for Civil Liberties

- All these three laureates represent civil society in their home countries. For many years, they have promoted the right to criticise power and protect the fundamental rights of citizens.

Ales Bialiatski:

- The 60-year-old, imprisoned in jail for alleged tax evasion, is known for working with the Human Rights Centre 'Viasna'.
- Bialiatski's activism began in the early 1980s when he got involved in several pro-democracy initiatives, including a group called Belarusian Clandestine Party "Independence", aiming to foster Belarus's leaving the Soviet Union and forming a sovereign and democratic country.
- He founded the human rights Centre 'Viasna' in 1996. The Minsk-based organisation, then called "Viasna-96", was transformed into a nationwide NGO in June 1999.
- On October 28, 2003, the Supreme Court of Belarus cancelled the state registration of the Human Rights Centre "Viasna" for its role in observing the 2001 presidential election. Since then, the leading Belarusian human rights organisation has been working without registration.
- On August 4, 2011, Ales Bialiatski was arrested under tax evasion charges. Many Belarusian human rights activists, European Union leaders, EU governments, and the US called his sentencing politically motivated.
- On August 11, Amnesty International declared Bialiatski, a prisoner of conscience. On June 21, 2014, he was released from prison 20 months ahead of schedule.
- On July 14, 2021, the Belarusian police raided Viasna's central office, following which Bialiatski was arrested and, on October 6, was charged with tax evasion with a maximum penalty of 7 years in prison.

Memorial- Russia:

- Founded during the fall of the Soviet Union to examine crimes committed under Joseph Stalin's rule, Memorial is an international human rights organisation.
- Before its dissolution six months ago, it consisted of two separate legal entities, Memorial International, which recorded the crimes against humanity

committed in the Soviet Union, and the Memorial Human Rights Centre, which focused on protecting human rights.

➪ The Memorial as a legal entity in Russia was closed and liquidated on April 5, 2022.

➪ In December 2021, a joint statement was released by the European Union, the US, Australia, Canada, and the UK, criticising the Russian court's decisions to shut Memorial and calling on Russia "to uphold its international human rights obligations and commitments".

According to its post-Soviet 1992 charter, Memorial pursued the following aims:

a) To promote mature civil society and democracy based on the rule of law and thus prevent a return to totalitarianism;

b) To assist the formation of public awareness based on the values of democracy and law, to extirpate totalitarian patterns (of thought and behavior), and to firmly establish human rights in everyday politics and public life;

c) To promote the truth about the historical past and perpetuate the memory of the victims of political repression carried out by totalitarian regimes.

Center for Civil Liberties- Ukraine:

➪ The Center for Civil Liberties is a Ukrainian human rights organisation led by lawyer Oleksandra Matviichuk. In 2007, leaders of human rights organisations from nine post-Soviet countries decided to create a cross-border resource support centre in Kyiv.

➪ Since then, the group has organised several information campaigns and international conferences.

➪ It carries out public control over human rights compliance in the activities of state and local government bodies; works with young people to form a new generation of young human rights activists and social activists; educates in the sphere of human rights and democracy, as well as implements a programme of international solidarity.

➪ Its mission is to establish human rights, democracy, and solidarity in Ukraine and the OSCE region to affirm human dignity.

About Nobel Prizes:

➪ Alfred Nobel, a Swedish chemist, engineer, industrialist, and the inventor of dynamite, in his last will and testament in 1895, gave the largest share of his fortune to a series of prizes in Physics, Chemistry, Physiology/Medicine, Literature, and Peace, to be called the "Nobel Prizes".

➪ In 1968, the sixth award, the Prize in Economic Sciences was started.

➪ In 2021, journalists Dmitry Muratov of Russia and Maria Ressa of the Philippines had won the Peace award for "their efforts to safeguard freedom of expression, which is a precondition for democracy and lasting peace."

What's next?

➪ These three winners will share the prize money of 10,000,000 Swedish Krona ($9,00,000), which will be officially handed over at a ceremony on 10 December.

2022 NOBEL IN ECONOMICS

THE SVERIGES RIKSBANK PRIZE IN ECONOMIC SCIENCES IN MEMORY OF ALFRED NOBEL 2022

Ben S. Bernanke   Douglas W. Diamond   Philip H. Dybvig

"for research on banks and financial crises"
THE ROYAL SWEDISH ACADEMY OF SCIENCES
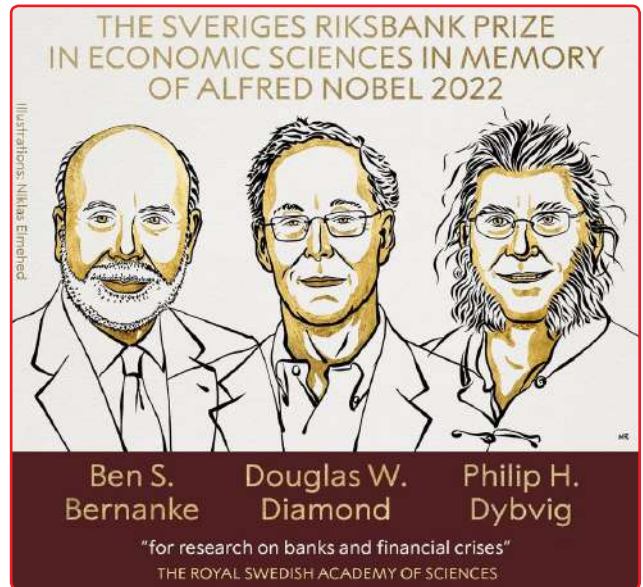
Why in news?

➪ The Nobel Prize in economics for 2022 has been awarded to Ben Bernanke, Douglas Diamond, and Philip Dybvig "for research on banks and financial crises."

➪ The Royal Swedish Academy of Sciences on Monday jointly awarded the 2022 Nobel Prize in Economics to Ben S. Bernanke, Douglas W. Diamond and Philip H. Dybvig "for research on banks and financial crises."

➪ While Bernanke was the former chair of US federal reserve, Diamond and Dybvig are US-based economists.

Why was the Nobel given to these three scholars?

➪ The committee says that the research of the three laureates has helped understand the role of the banks in the economy, particularly during financial crises. Their research shows why avoiding a bank collapse is very important for the economy.

➪ The economics Nobel Prize is actually called the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel. The Sveriges Riksbank, which is Sweden's central bank, came into being due to a bank failure.

➪ In 1656, the then king of Sweden approved the foundation of Sweden's first bank, the Stockholms Banco, which also became the first bank to issue bank notes in Europe. However, Banco over-issued notes

leading to its liquidation in 1667. In 1668, the Swedish Nobles decided to found the Riksens Ständers Bank, which was later renamed as Sveriges Riksbank in 1867.

➾ In 1968, on its tercentenary, the Sveriges Riksbank decided to award the economics prize in memory of Alfred Nobel. The award itself was the result of an ongoing crisis and conflict between the central bank and the government.

➾ The purpose of mentioning this history is to highlight how failures are central to banks. Banks have failed ever since they were created. It is the first time the Nobel committee has decided to award the prize to three scholars who studied these failures.

What does Ben Bernanke say about banking crises?

➾ In the 1930s, the world economy faced a serious economic contraction called the Great Depression. For many years, it was thought the Great Depression was due to a lack of policy stimulus.

➾ The economist John Maynard Keynes had argued that monetary policy was ineffective in such crises as interest rates could not go lower than zero percent, and one needed a large fiscal stimulus.

➾ Milton Friedman argued that central banks could create money even when interest rates were zero by buying assets, thereby increasing the money supply.

Bernanke's version:

➾ Bernanke said that while a lack of policy stimulus explains the contraction, it does not explain why the Great Depression continued for such a long time. The economic contraction had led to a large number of bank failures.

➾ His argument was that it was this large-scale failure of banks which prolonged the crisis. Banks were not in a position to channel loans towards productive activities, leading to the crisis becoming more severe in the US.

➾ Banks have special insights into companies, and when a bank fails, all this information is lost. A failed banking system takes many years to repair and the economy performs very poorly in this period. This explains why the Great Depression became such a prolonged crisis. He drew his analysis from a deep understanding of economic and monetary history.

What are Diamond's and Dybvig's insights into banking crises?

➾ Bernanke explained what happens when banks fail. Diamond and Dybvig explained why banks fail. In a joint research, hence called the Diamond-Dybvig model, they explain that banks fail when depositors rush for their money. In their model, banks are seen as financial intermediaries that intermediate funds from depositors to loan seekers.

➾ The deposits are for shorter durations whereas loans are typically given for longer durations (technically called the maturity transformation function of banks). The banks are seen as entities that help savers meet investors, and by channeling loans towards good projects, banks help an economy grow.

➾ However, banks are also prone to runs by depositors. In their research, they show that once there is a rumor about a bank's weakness, it spreads like wildfire, causing a bank run, when depositors literally run for their funds to the bank. As banks lend most of the funds towards long-term projects, the loans cannot be recalled easily to repay the depositors. If the rumour is not addressed, it leads to eventual bank failure.

➾ While many know this is basically how banks fail, the prize-winning duo formalised the model.

➾ They also presented a solution for bank failures via deposit insurance, which was also introduced before their research.

➾ In 1933, the US was the first country to adopt deposit insurance, followed by India in 1962. Both adopted deposit insurance after a significant number of banks failed in these countries.

What does the prize mean for Indian banking?

➾ India has been facing sporadic a banking crises from 2013 where few banks failed. Bernanke's research shows how once a crisis starts, it can prolong not just banking problems but also lower economic growth over time.

➾ Diamond-Dybvig's research shows how the weak performance of individual banks like the Punjab and Maharashtra Urban Cooperative Bank and Yes Bank lead to runs, and the banks need to be bailed out by the government.

➾ There was also the case of ICICI bank which faced a run in 2008 based on rumours, but the run was stalled by the central bank by issuing a notifcation assuring the sound health of the bank.

➾ Economist and former Reserve Bank of India (RBI) chief Raghuram Rajan seemed to have missed out on the award. He is a leading scholar on banking and has written many research papers with 2022 awardee, Douglass Diamond. The committee has cited 12 of his research papers, which are a significant contribution to the field of banking.

About Nobel prize in economics:

➾ Unlike the other prizes, the economics award wasn't established in Alfred Nobel's will of 1895 but by the Swedish central bank in his memory. The first winner was selected in 1969.

➾ In 2021, half of the award went to David Card for his research on how the minimum wage, immigration and education affect the labor market.

➾ The other half was shared by Joshua Angrist and Guido Imbens for proposing how to study issues that don't easily fit traditional scientific methods.

Way Forward:

➲ Nobel prizes carry a cash award of 10 million Swedish kronor (nearly $900,000) and will be handed out on 10 December.

THE GAMBIA DEATHS AND THE TOXIC COUGH SYRUPS

Why in news?

➲ Recently, the Gambia's Health Minister said that the number of child deaths likely linked to contaminated cough syrups made by an Indian manufacturer had risen to 69.

What happened in the Gambia?

➲ In early September, health authorities in the the Gambia were investigating if there was a link between dozens of child deaths from acute kidney injuries and the consumption of a paracetamol syrup used for fever, cough, cold, and pain.

➲ Doctors began to witness a spike in the number of cases of severe kidney injuries in children under the age of five by late July and suspected a link with medicines.

➲ A number of children began to get sick with kidney problems within three to five days of consuming a paracetamol syrup sold locally. The affected would experience fever, inability to pass urine, and vomiting, followed by kidney failure.

Alert by WHO:

➲ The Gambia started coordinating with the World Health Organisation about the incidents and reported four locally-sold cough syrups it suspected could be linked to the injuries and deaths.

➲ On October 5, the WHO issued a medical alert about four substandard products— products "that fail to meet either their quality standards or specifications".

➲ These were four cough syrup variants- Promethazine Oral Solution, Kofexmalin Baby Cough Syrup, Makoff Baby Cough Syrup and Magrip N Cold Syrup, whose manufacturer was stated as Maiden Pharmaceuticals Limited, Haryana, India.

➲ The alert added that the substandard products mentioned were unsafe and their use, especially in children, could "result in serious injury or death".

What are the toxic chemicals found in samples tested by the WHO?

➲ According to the WHO, diethylene glycol and ethylene glycol are toxic to humans when consumed and can prove to be fatal.

➲ Both diethylene glycol and ethylene glycol are illegal adulterants that may be used as solvents in liquid medication.

➲ Common solvents such as glycerine (also known as glycerol) and propylene glycol are used in cough syrups to provide a liquid base to non-water-soluble paracetamol or acetaminophen; these solvents also act as preservatives, thickeners, sweeteners, and antimicrobial agents.

➲ Medical experts say that in order to cut expenses and due to the solubility of compounds like diethylene glycol and ethylene glycol, manufacturers may sometimes substitute it for nontoxic solvents such as glycerine or propylene glycol or comparatively cheaper commercial grade versions of these solvents which may contain diethylene glycol and ethylene glycol, potentially resulting in contamination.

Earlier instances:

Cases abroad:

➲ Instances of contamination and deaths linked to diethylene glycol, however, are not new. Such cases have been reported before in India, the United States, Bangladesh, Panama, and Nigeria.

➲ In 2007, the U.S. Food and Drug Administration (FDA) issued a guidance to pharmacy compounders, repackers, and suppliers about a potential public hazard— glycerin(e) contaminated with diethylene glycol (DEG), calling DEG a "poison". The FDA's advisory followed reports of fatal DEG poisoning of consumers who ingested medicinal syrups, such as cough syrup or acetaminophen syrup.

Cases in India:

➲ In 2021, 12 children died in Udhampur district of Jammu due to contaminated cough syrup called Coldbest-PC, manufactured by a company in Himachal Pradesh. These deaths were also linked to the presence of high levels of diethylene glycol in the cough syrup. The State's administration later ordered the withdrawal of the drug from all the other States where it was marketed. This was the fourth case of mass glycol poisoning in India.

➲ In 1973, there was a similar incident at the Children's Hospital, Egmore in Chennai that caused the deaths of 14 children. In 1986, similar poisoning at Mumbai's J.J. Hospital caused the deaths of 14 patients who were otherwise on the path to recovery. In 1998, 33 children died in two hospitals located in New Delhi due to similar poisoning.

Ongoing probe:

➲ The WHO has initiated a deeper probe in coordination with Indian authorities.

- India's Central Drugs Standard Control Organisation (CDSCO) has also launched a detailed investigation to ascertain the facts and details of the matter in collaboration with the State Drugs Controller of Haryana, the state where the manufacturer Maiden Pharmaceuticals is located.
- According to the preliminary inquiry, Maiden Pharmaceutical Limited was licensed by the State drug controller for the products under reference and held manufacturing permission for these products. The company has so far exported these four cough syrups only to the Gambia.
- According to the All India Organisation of Chemists and Distributors (AIOCD), none of the four cough syrups mentioned in the WHO's alert was available for sale in India.

What's next?

- Indian authorities are now waiting for the WHO to share the exact 'one-to-one causal relation of death' with the four medicines and the details of product labels so that they can identify the "source of the manufacturing of the products".
- As a practice, the importing country tests the products for quality before sanctioning their usage. Gambian President has vowed, meanwhile, to boost health and safety measures including better quality control over imported medicines, ordering the creation of "a quality control national laboratory for drugs and food safety".

MATHURA GETS ITS FIRST HEALTH ATM

Why in news?

- Recently, a health ATM was installed at the Mathura district hospital. Such machines would be installed in every district hospital of Uttar Pradesh.
- The installation of health ATMs across the populous state is part of the Uttar Pradesh government's plan to rejuvenate health infrastructure.

Developed by:

- The Uttar Pradesh government is installing Health ATMs manufactured and designed by Mumbai headquartered health-tech company, Yolohealth.
- This company is also responsible for Health ATMs in other cities.

What are health ATMS?

- Just like an Automated Teller Machine (ATM) in a bank, a health ATM is a touch-screen kiosk hardware, designed for managing health-related information.
- In very simple words, it's a machine that can carry out several pathological tests on a person, dispense medicines, and help patients interact with doctors virtually.
- Doctors and medical experts observe that a Health ATM can conduct a check-up for 23 diseases in 15 minutes.
- The machine can also check the patients' condition, including their height, weight, body temperature, blood glucose, blood pressure, and oxygen saturation levels. It will also conduct electrocardiogram (ECG).
- The Health ATM is integrated with medical devices to conduct neurology, pulmonary, gynaecology, and cardiology tests.

Benefits of Health ATMs:

- The Health ATMs will help in ensuring medical services to all people, in every nook and corner of the country.
- As the machine enables patients to connect with doctors virtually, it will bridge the gap of quality healthcare, especially in rural areas, and help patients see well-qualified doctors even from remote locations.
- Furthermore, as people live a quick-paced life, this machine will help them save their precious time and avail of services and tests without having to wait long periods.
- The motive behind providing the facility of health ATMs 24×7 is to give benefit to those people who reach home late due to work. People will be able to get their full body check-up done in 10 minutes at a Health ATM.
- The machines also make health facilities more accessible as they are not exorbitant. While in some cases, a patient can get 30 tests done for Rs 200, in other places, a patient can undergo 18 various health check-ups for a nominal fee of Rs 100.
- Apart from these benefits, the Health ATMs will also maintain records of registered patients, including their lab reports, which they can access any time, any place.
- It will also help doctors to check and access the patient's past health records during a video call.

Other Health ATMs:

- The Mathura Health ATM is not the first in the state. Earlier, in September, Chief Minister had inaugurated the first health ATM in Gorakhpur at the Chargawan Community Health Centre.
- Similar Health ATMs have also been installed by the Indian Railways at various stations where passengers can undergo medical check-up of 16 parameters (basic) at a cost of Rs 50 and 18 parameters (basic+HB+Sugar) for Rs 100.

- The state of Kerala also installed its first Health ATM early this year to bolster the in-house health check-ups without the constraints of time.

WHO GLOBAL TB REPORT 2022
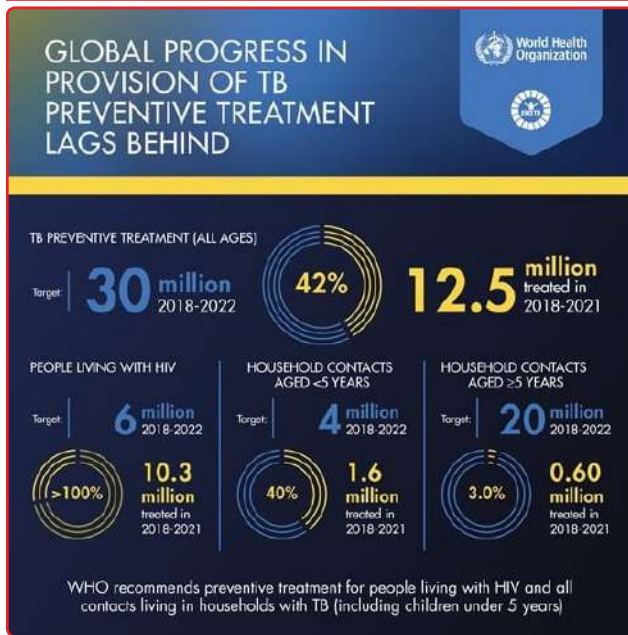
Why in news?

- Recently, the WHO released the Global TB Report 2022.
- The Report notes the impact of the COVID-19 pandemic on the diagnosis, treatment and burden of disease for TB all over the world.

Findings related to India:

- India's TB incidence for the year 2021 is 210 per 100,000 population – compared to the baseline year of 2015 (incidence was 256 per lakh of population in India); there has been an 18% decline which is 7 percentage points better than the global average of 11%.
- These figures also place India at the 36th position in terms of incidence rates (from largest to smallest incidence numbers).

How India was able to successfully offset the disruptions caused by COVID-19 pandemic?

- While the COVID-19 pandemic impacted TB Programmes across the world, India was able to successfully offset the disruptions caused, through the introduction of critical interventions in 2020 and 2021, this led to the National TB Elimination Programme notifying over 21.4 lakh TB cases, 18% higher than 2020.
- This success can be attributed to an array of forward-looking measures implemented by the Programme through the years, such as the mandatory notification policy to ensure all cases are reported to the government.

- Further, intensified door-to-door Active Case Finding drives to screen patients and ensure no household is missed, has been a pillar of the Programme. In 2021, over 22 crore people were screened for TB.
- The aim has been to find and detect more cases to arrest onwards transmission of the disease in the community which has contributed to the decline in incidence. For this purpose, India has also scaled up diagnostic capability to strengthen detection efforts.
- Indigenously-developed molecular diagnostics have helped expand the reach of diagnosis to every part of the country today. India has over 4,760 molecular diagnostic machines across the country, reaching every district.

National Prevalence Survey:

- Against this backdrop, and prior to the publication of the Global Report, the Ministry of Health and Family Welfare had communicated to WHO that the Ministry has already initiated domestic studies to arrive at a more accurate estimate of incidence and mortality rates in a systematic manner and India's data will be provided after conclusion of studies in early part of 2023.
- The WHO has also acknowledged the Health Ministry's position on this and noted in the Report that "estimates of TB incidence and mortality in India for 2000–2021 are interim and subject to finalization, in consultation with India's Ministry of Health & Family Welfare".
- The results of the Health Ministry's study, initiated by the Central TB Division (CTD), will be available in approximately six months' time and shared further with WHO. These steps are in line with India conducting its own National Prevalence Survey to assess the true TB burden in the country – the world's largest such survey ever conducted.
- The WHO Report notes that India is the only country to have completed such a survey in 2021, a year which saw "considerable recovery in India".

Ni-kshay Poshan Yojana:

- The WHO Report notes the crucial role of nutrition and under-nutrition as a contributory factor to the development of active TB disease.
- In this respect, the TB Programme's nutrition support scheme, Ni-kshay Poshan Yojana has proved critical for the vulnerable. During 2020 and 2021, India made cash transfers of 89 million dollars (INR 670 crores) to TB patients through a Direct Benefit Transfer programme.
- Moreover, in September 2022, the President of India has launched a first-of-its-kind initiative, Pradhan Mantri TB Mukt Bharat Abhiyan to provide additional nutritional support to those on TB treatment, through contributions from community including individuals and organizations.
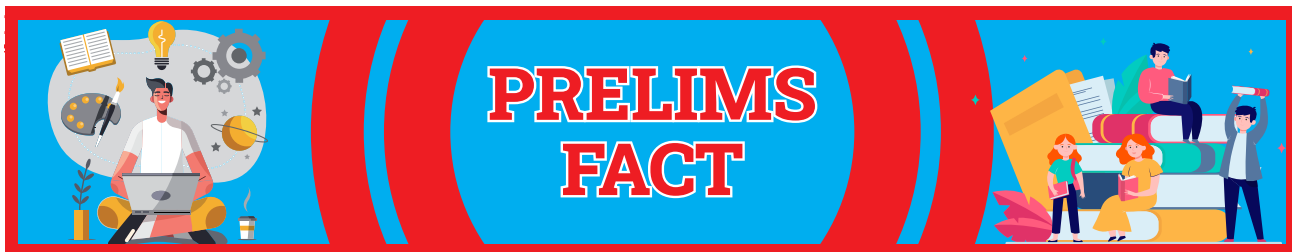
POLITY & GOVERNANCE

SWACHH SURVEKSHAN AWARDS 2022

Why in news?

➲ India celebrated 8 years of Swachh Bharat Mission and the first anniversary of SBM-Urban 2.0 recently.

➲ President Droupadi Murmu felicitated the awardees of the cleanest States and cities at the award ceremony of Azadi@75 Swachh Survekshan 2022, hosted as part of Swachh Bharat Mission-Urban 2.0 by Ministry of Housing & Urban Affairs (MoHUA) at Talkatora Stadium, New Delhi.

Top Performers:

➲ Indore, the city of lakes and palaces, adjudged the Cleanest City title for the sixth consecutive year, in the 'more than 1 lakh population' category, while Surat was adjudged the second cleanest city, for the second time in a row. Navi Mumbai bagged the third spot.

➲ In the population category of 'less than 1 lakh', Panchgani and Karad from Maharashtra bagged the first and third positions respectively, while Patan from Chhattisgarh bagged the second position.

➲ Tirupati received the best city award in Safai Mitra Suraksha.

➲ In to the survey, Maharashtra's Deolali was adjudged the country's cleanest Cantonment Board.

➲ Shivamogga in Karnataka received the fast mover city award.

➲ Indore further cemented its position by emerging as India's first 7-star Garbage Free city, while Surat, Bhopal, Mysuru, Navi Mumbai, Vishakhapatnam, and Tirupati earned 5-star Garbage Free certifications.

Ganga towns:

➲ Haridwar was adjudged the cleanest Ganga town in the category of more than 1 lakh population, followed by Varanasi and Rishikesh.

➲ Bijnor was ranked the first among Ganga towns with fewer than one lakh population followed by Kannauj and Garhmukhteshwar respectively.

States:

➲ The State awards saw a few surprises. Madhya Pradesh emerged as the 'Cleanest State' in the category of "more than 100 Urban Local Bodies", relegating Chhattisgarh, the Cleanest State of the previous 3 years, to second place. Maharashtra emerged as third cleanest State.

➲ Similarly, Tripura emerged as the Cleanest State award in the "less than 100 ULBs category", dislodging Jharkhand, which had won in the last 2 consecutive years.

➲ Jharkhand and Uttarakhand received the second and third spots respectively.

Overall performance:

➲ In all, 22 States and 5 UTs received awards, of whom 8 States received more than 10 awards each.

➲ 8 States and 5 UTs have shown improvements ranging between 5 – 25% in their overall ground level performance over last year. Of them, 4 out the 8 North Eastern states have shown significant improvement in the overall performance over the last year.

➲ Moreover, 10 Cantonment Boards (against 7 CBs last year) and 2 Ganga towns received awards.

➲ A heartening feature of the awards was that smaller cities with population of less than 25,000 have performed admirably in the survey, with 40 of them received awards.

Garbage Free India:

➲ The vision of a Garbage Free India under SBM-U 2.0 was given further impetus by announcing the results of 7-star and 5-star rated cities under the Star Rating Protocol of Garbage Free Cities.

➲ The revised Star Rating Protocol of Garbage Free Cities was launched in 2021 to holistically evaluate cities across solid waste management parameters.

Background:

➲ The 7th edition of Swachh Survekshan was conducted to study the progress of the Swachh Bharat Mission (Urban) and rank the Urban Local Bodies (ULBs) based on various cleanliness and sanitation parameters.

➲ The Survekshan has evolved from being an assessment of 73 cities in 2016 to covering 4,354 cities this year.

SPECIAL CAMPAIGN 2.0 TO REDUCE PENDENCY IN GOVERNMENT OFFICES

Why in news?

⮕ Recently, the Ministry of Personnel, Public Grievances & Pensions launched its month-long Special Campaign 2.0 focusing on the timely disposal of pending references in government offices and departments, as well as a clean workspace.

Key Highlights:

⮕ As part of a campaign from 2 October to 31 October, a review will be done of all kinds of pendency in different categories like Minister of Parliament (PM) references, Prime Minister's Office (PMO) references, Cabinet references, state government references, public grievances, easing of rules and processes, files taken up for review, cleanliness campaign sites taken up and rules identified for easing.

⮕ The Special Campaign 2.0 is expected to cover over 1.5 lakh Post Offices, overseas mission/posts, Railway Stations, and other public offices in mission mode during the month-long campaign.

⮕ The scope and mandate of Special Campaign 2.0 has been expanded and it will focus more on field/outstation offices in addition to the Ministries/Departments and their attached/subordinate offices and Autonomous Bodies of Government of India.

Implementation:

⮕ Department of Administrative Reforms and Public Grievances (DARPG) will oversee implementation of the Special campaign 2.0.

Background:

⮕ The first phase of Special Campaign launched in October 2021, about 12 lakh sq. ft. of space was freed up in offices for productive use and Rs.62 Crore earned from disposal of scrap.

PM'S SCHEME FOR MENTORING YOUNG AUTHORS YUVA 2.0 LAUNCHED

Why in news?

⮕ Recently, the Ministry of Education, Department of Higher Education, launched YUVA 2.0 - Prime Minister's Scheme for Mentoring Young Authors.

⮕ It is an Author Mentorship programme to train young and budding authors (below 30 years of age) in order to promote reading, writing and book culture in the country, and project India and Indian writings globally.

Vision & Theme:

⮕ The launch of YUVA 2.0 (Young, Upcoming and Versatile Authors) is in tune with the Prime Minister's vision to encourage the youth to understand and appreciate India's democracy.

⮕ YUVA 2.0 is a part of India@75 Project (Azadi Ka Amrit Mahotsav) to bring to the fore the perspectives of the young generation of writers on the THEME: 'Democracy (institutions, events, people, constitutional values – past, present, future)' in an innovative and creative manner.

⮕ This scheme will thus help to develop a stream of writers who can write on a spectrum of subjects to promote Indian heritage, culture and knowledge system.

Implementation:

⮕ The National Book Trust, India, under the Ministry of Education as the Implementing Agency will ensure phase-wise execution of the Scheme under well-defined stages of mentorship.

⮕ The books prepared under this scheme will be published by National Book Trust, India, and will also be translated into other Indian languages ensuring the exchange of culture and literature, thereby promoting 'Ek Bharat Shreshtha Bharat'.

⮕ The selected young authors will interact with some of the best authors of the world, participate in literary festivals etc.

Way Forward:

➲ NEP 2020 has emphasized on the empowerment of the young minds and creating a learning ecosystem that can make the young readers/learners ready for leadership roles in the future world.

➲ India tops the chart in youth population being 66% of the total, waiting to be tapped for capacity building and thereby nation building.

➲ With the purpose of mentoring a new generation of young creative writers, there is an imminent requirement to take initiatives at highest level, and in this context, YUVA 2.0 will go a long way in laying the foundation of the future leaders of the creative world.

OVER 69% HOUSES CONSTRUCTED UNDER PMAY IN RURAL INDIA ARE OWNED BY WOMEN

Why in news?

➲ Over 69% of houses constructed under the Prime Minister's special housing scheme are either wholly or jointly owned by women in rural areas.

Details:

➲ According to the data shared by the government, as on September 29, 2022, a total of two crore houses had been constructed out of the 2.46 crore houses that were sanctioned.

➲ Of this, 69% are owned partly or completely by women.

Pradhan Mantri Awas Yojana (Gramin):

➲ The Pradhan Mantri Awas Yojana (Gramin) was launched by the Prime Minister in 2016 with the aim of constructing 2.95 crore houses.

➲ To achieve the objective of "Housing for All" by 2022, the erstwhile rural housing scheme Indira Awaas Yojana (IAY) was restructured to Pradhan Mantri Awaas Yojana-Gramin (PMAY-G).

Pradhan Mantri Ujjwala Yojana:

➲ According to the government, another initiative which has helped safeguard the health of women and children was ensuring supply of clean cooking fuel under the Pradhan Mantri Ujjwala Yojana.

➲ It is a scheme of the Ministry of Petroleum & Natural Gas for providing LPG connections to women from Below Poverty Line (BPL) households.

➲ The scheme was originally launched on May 1, 2016, in Ballia, Uttar Pradesh by the Prime Minister of India with a target of releasing 8 crore connections by March 2020.

➲ Over 9.4 crore LPG connections have been released under the Ujjwala Yojana.

➲ This scheme also received global recognition from International Energy Agency, which has described it as a major achievement in improving the environment and health of women.

Swachh Bharat Mission:

➲ Another scheme that has helped women gain dignity and security is the Swachh Bharat Mission under which 11.5 crore toilets were constructed in the rural areas and 70 lakh were built in the urban areas.

➲ It was launched in 2014 by the Ministry of Jal Shakti to accelerate the efforts to achieve universal sanitation coverage and to put focus on sanitation.

➲ Access to toilets and the safety, convenience and self-respect of women in rural India, to claim that after the construction of toilets, 93% of women reported that they were no longer afraid of being hurt by someone or harmed by animals while defecating.

➲ As many as 93% of women reported they are no longer afraid of contracting health infections; 92% of women said they were no longer afraid of going to the toilet in the dark of night.

Way Forward:

➲ It had been the government's endeavour to ensure women get a fair share of government schemes under the Nari Shakti initiative.

➲ The idea behind the initiative is to have "women-led" development instead of "development of women".

PRIME MINISTER'S DEVELOPMENT INITIATIVE FOR NORTH EAST REGION (PM-DEVINE)

Why in news?

➲ Recently, the Union Cabinet has approved a new Scheme, Prime Minister's Development Initiative for North East Region (PM-DevINE) for the remaining four years of the 15th Finance Commission from 2022-23 to 2025-26.

Implementation:

➲ PM-DevINE, is a Central Sector Scheme with 100% Central funding and will be implemented by Ministry of Development of North Eastern Region (DoNER).

➲ PM-DevINE will be implemented by Ministry of DoNER through North Eastern Council or Central Ministries/ agencies.

The objectives of PM-DevINE are to:

a) Fund infrastructure convergently, in the spirit of PM Gati Shakti;

b) Support social development projects based on felt needs of the NER;

c) Enable livelihood activities for youth and women;
d) Fill the development gaps in various sectors.

Financial outlay:

- The PM-DevINE Scheme will have an outlay of Rs.6,600 crore for the four year period from 2022-23 to 2025-26 (remaining years of 15th Finance Commission period).
- Efforts will be made to complete the PM-DevINE projects by 2025-26 so that there are no committed liabilities beyond this year. This implies front-loading of the sanctions under the Scheme in 2022-23 and 2023-24 primarily.
- While expenditure would continue to be incurred during 2024-25 and 2025-26, focused attention will be given to complete the sanctioned PM-DevINE projects.

Significance:

- PM-DevINE will lead to creation of infrastructure, support industries, social development projects and create livelihood activities for youth and women, thus leading to employment generation.
- Measures would be taken to ensure adequate operation and maintenance of the projects sanctioned under PM-DevINE so that they are sustainable.
- To limit construction risks of time and cost overrun, falling on the Government projects would be implemented on Engineering-procurement-Construction (EPC) basis, to the extent possible.

MDoNER Schemes for the development of NER:

- There are other MDoNER Schemes for the development of North Eastern Region. The average size of projects under other MDoNER Schemes is about Rs.12 crore only.

Background:

- PM-DevINE, was announced in the Union Budget 2022-23 to address development gaps in the North Eastern Region (NER). Announcement of PM-DevINE is yet another instance of the importance being attached to the development of NE Region by the Government.
- PM-DevINE is an additionality to the quantum of resources available for the development of the NER. It will not be a substitute for existing Central and State Schemes.
- While some of the projects to be approved for 2022-23 under PM-DevINE are part of the Budget announcement, projects with substantial socio-economic impact or sustainable livelihood opportunities for the general public (e.g., basic infrastructure in all Primary Health Care Centres, comprehensive facilities in Government Primary and Secondary Schools, etc) may be considered in the future.

Why PM-DevINE?

- The justification for announcement of PM-DevINE is that the parameters of NE States in respect of Basic Minimum Services (BMS) are well below the national average and there are critical development gaps as per the BER District Sustainable Development Goad (SDG) Index 2021-22 prepared by NITI Aayog, UNDP and MDoNER.
- The new Scheme, PM-DevINE was announced to address these BMS shortfalls and development gaps.

Way Forward:

- PM-DevINE will provide support to infrastructure and social development projects which may be larger in size and will also provide an end-to-end development solution instead of isolated projects.

GOVERNMENT NOTIFIES AMENDMENTS TO THE INFORMATION TECHNOLOGY (INTERMEDIARY GUIDELINES AND DIGITAL MEDIA ETHICS CODE) RULES 2021

Why in news?

- Recently, the Ministry of Electronics & IT notified the amendments to the IT intermediary Rules 2021.
- In a major push towards an Open, Safe & Trusted and Accountable Internet, the Ministry notified these amendments aimed at protecting the rights of Digital Nagriks.

Key changes effected in the rules are as under:

a) Currently, intermediaries are only required to inform users about not uploading certain categories of harmful/unlawful content. These amendments impose a legal obligation on intermediaries to take reasonable efforts to prevent users from uploading such content. The new provision will ensure that the intermediary's obligation is not a mere formality.

b) For effective communication of the rules and regulations of the intermediary, it is important that the communication is done in regional Indian languages as well.

c) The grounds in rule 3(1)(b)(ii) have been rationalized by removing the words 'defamatory' and 'libellous'. Whether any content is defamatory or libellous will be determined through judicial review.

d) Some of the content categories in rule 3(1)(b) have been rephrased to deal particularly with misinformation, and content that could incite violence between different religious/caste groups.

e) The amendment requires intermediaries to respect the rights guaranteed to users under the Constitution, including a reasonable expectation of due diligence, privacy and transparency.

f) Grievance Appellate Committee(s) will be established to allow users to appeal against the inaction of, or decisions taken by intermediaries on user complaints. However, users will always have the right to approach courts for any remedy.

Significance:

➲ It enhances due diligence requirements and ensuring accountability of social media and other intermediaries.

➲ They have been notified against the backdrop of complaints regarding the action/inaction on the part of the intermediaries on user grievances regarding objectionable content or suspension of their accounts.

➲ The intermediaries now will be expected to ensure that there is no uploading of content that intentionally communicates any misinformation or information that is patently false or untrue hence entrusting an important responsibility on intermediaries.

➲ The rules have made it explicit for the intermediary to respect the rights accorded to the citizens of India under the Articles 14, 19 and 21 of the Indian Constitution.

INTERNATIONAL RELATION

CHINA WITHDRAW RESOLUTION AGAINST AUKUS AT IAEA

Why in news?

➲ Recently, the General Conference of the International Atomic Energy Agency (IAEA) was held in Vienna from 26-30 September 2022.

➲ China tried to get a resolution passed against the AUKUS pact.

➲ India's deft diplomacy forced China to withdraw its resolution against the AUKUS.

Key Highlights:

➲ China argued that this initiative was in violation of its responsibilities under the Nuclear Non-Proliferation Treaty (NPT). It also criticized the role of the IAEA in this regard.

➲ India took an objective view of the initiative, recognising the soundness of the technical evaluation by the IAEA.

➲ India's considered role helped many smaller countries take a clear stand on the Chinese proposal. Realizing that its resolution would not get majority support, China withdrew its draft resolution.

What is AUKUS?

➲ AUKUS is a trilateral security pact between Australia, the United Kingdom and the United States in the Indo-Pacific.

➲ It aims at providing nuclear submarines to Australia.

➲ Australia is now set to join an elite group of only six countries; India, the US, the UK, France, Russia and China that operate nuclear-powered submarines.

➲ It will also be the only country to have such submarines without having a civilian nuclear power industry.

RUSSIA ANNEXES FOUR UKRAINIAN REGIONS

Why in news?

➲ Recently, the Russian President Vladimir Putin signed an accord to formally annex four Ukrainian regions to Russia.

➲ He said that the people living in the four regions are "Russian citizens forever" and any attack on the annexed regions will be an "attack on Russia."

Key Highlights:

➲ He announced the annexation of Lugansk, Donetsk, Kherson and Zaporizhzhia.

➲ With the formal announcement of the four regions; Russia is now in control of 15 per cent of Ukraine's territory.

What it means for Russia?

➲ In addition to occupying more land, Russia now have a larger pool of people to draft into the military. With

these regions joining Russia, they are eligible to be drafted to fight for Russia against Ukraine.

- There are also tactical benefits to annexing Ukrainian territory. After failing to achieve his ambitions of taking over Kyiv and removing the government led by President Volodymyr Zelenskyy, Russia's move of annexation will help him shore up his power and cement his control over regions.
- But by annexing Ukrainian territory, Russia has given a further justification for the mobilisation.
- Russia may also hope that the move will boost support for the war both domestically and among Russia's international allies, such as China.

Background:
- The separatist Donetsk and Luhansk regions in eastern Ukraine have been backed by Moscow since declaring independence in 2014, weeks after the annexation of Ukraine's Crimean Peninsula.
- The southern Kherson region and part of the neighboring Zaporizhzhia were taken by Russia soon after Putin sent troops into Ukraine on 24 February.

WORLD HEALTH SUMMIT: GLOBAL LEADERS PLEDGE $2.5 BILLION FOR POLIO ERADICATION

Why in news?
- Recently, the Global leaders committed to donating $2.54 billion for eradicating polio at the World Health Summit.
- World Health Summit held in Berlin, Germany.

Stakeholders:
- Bill & Melinda Gates Foundation pledged $1.2 billion to the largest international public health initiative, Global Polio Eradication Initiative (GPEI).
- Humanitarian organization Rotary International pledged $150 million, the United States pledged 114

million, Germany over $70 million and France over $49 million.

- The GPEI is led by national governments with six core partners - Rotary International, the World Health Organization (WHO), the US Centers for Disease Control and Prevention (CDC), United Nations Children's Fund (UNICEF), the Bill & Melinda Gates Foundation and Gavi, the Vaccine Alliance.

How this funding will help in polio eradication?
- The funding will support global efforts to overcome the final hurdles to polio eradication, vaccinate 370 million children annually over the next five years and continue disease surveillance across 50 countries.
- The initiative needed $4.8 billion to implement its 2022-2026 strategy fully. If fully funded, the strategy can save up to $33.1 billion in health cost savings this century compared to the price of controlling outbreaks.
- It would also be able to deliver additional health services and immunizations alongside polio vaccines to underserved communities.

Declaration on 2022-2026 strategy:
- A declaration endorsing the 2022-2026 strategy was also released by a group of more than 3,000 influential scientists, physicians, and public health experts from around the world. It called on n donors to stay committed to eradication and ensure GPEI is fully funded.
- The new tactics contained in the programme's strategy, like the continued roll-out of the novel oral polio vaccine type 2 (nOPV2), that make them confident in GPEI's ability to end polio.
- Five hundred million doses of nOPV2 have already been administered across 23 countries and field data continued to show its promise as a tool to more sustainably stop outbreaks of type 2 circulating vaccine-derived polioviruses (cVDPV).

Potential threats:
- Wild poliovirus is endemic in just two countries — Pakistan and Afghanistan. However, after just six cases were recorded in 2021, 29 cases have been recorded so far this year, including a small number of new detections in southeast Africa linked to a strain originating in Pakistan.

⮵ Additionally, outbreaks of cVDPV, variants of the poliovirus that can emerge in places where not enough people have been immunized, continue to spread across parts of Africa, Asia and Europe, with new outbreaks detected in the United States, Israel and the United Kingdom in recent months.

Way Forward:

⮵ Polio, like any virus, knows no borders; its continued transmission threatens children everywhere. With strong financial and political commitments, the long-awaited vision of a polio-free world can become a reality.

INDIA ABSTAINS FROM UN RESOLUTION AGAINST RUSSIAN ANNEXATION OF UKRAINIAN REGIONS

Why in news?

⮵ Recently, India abstained on a draft resolution tabled in the UN Security Council which condemned Russia's referenda and annexation of four Ukrainian territories and called for an immediate cessation of violence while underlining the need to find pathways for a return to the negotiating table.

What was the resolution?

⮵ The UN Security Council voted on the draft resolution tabled by the United States and Albania that condemns Russia's organisation of referenda in regions within Ukraine's internationally recognised borders.

⮵ The resolution declares that Russia's "unlawful actions" with regards to the "illegal so-called referenda" in parts of Ukraine's regions that are under Russia's temporary control can have "no validity" and cannot form the basis for any alteration of the status of these regions of Ukraine, including any purported annexation of any of these regions by Moscow.

⮵ It also decides that Russia shall immediately, completely, and unconditionally withdraw all of its military forces from the territory of Ukraine within its internationally recognised borders, which includes those regions addressed by the "illegal so-called referenda" to enable a peaceful resolution of the conflict between Russia and Ukraine through political dialogue, negotiation, mediation or other peaceful means.

Abstaining nations:

⮵ The resolution failed to get adopted as Russia vetoed it. Of the 15-nation Council, 10 nations voted for the resolution while China, Gabon, India, and Brazil abstained.

India's stand:

⮵ Referring to PM Modi's remark to Putin on the sidelines of the Shanghai Cooperation Organisation (SCO) Summit in Uzbekistan's Samarkand that today's era is not an era of war, India's Permanent Representative to the UN said that India sincerely hopes for an early resumption of peace talks to bring about an immediate ceasefire and resolution of the conflict.

⮵ India's position has been clear and consistent from the very beginning of this conflict. The global order is anchored on the principles of the UN Charter, international law and respect for sovereignty and the territorial integrity of all states. Escalation of rhetoric or tension is in no one's interest.

1ST ASEAN-INDIA START-UP FESTIVAL 2022

Why in news?

⮵ Recently, the Secretary, Department of Science and Technology, inaugurated the 1st ASEAN-India Start-up Festival (AISF) in Bogor, Indonesia.

⮵ The AISF is part of a series of events to commemorate the 30th Anniversary of the ASEAN-India diplomatic relationship.

Stakeholders:

⮵ The festival is part of the over-all ASEAN-India Science, Technology and Innovation Cooperation program between the ASEAN Committee on Science, Technology, and Innovation (COSTI) and the Department of Science and Technology (Govt of India).

⮵ It is supported under the ASEAN-India Science and Technology Development Fund (AISTDF) of Govt of India which is jointly contributed by Department of Science and Technology and Ministry of External Affairs (MEA).

Key Highlights:

➲ Comprising of four main events; startup exhibitions; seminar and talk show; G2G meetings and B2B meetings, as well as startup pitch battle, it has brought together government officials, startups, research institutes, universities, inventors and innovators, and other financial institutes.

➲ The festival provided a platform to further expand the national startup ecosystem to global networks, seeking cooperation for cumulative growth and creating of more opportunities.

➲ The festival commemorates and strengthens cooperation and collaboration in science, technology, and innovation between the ASEAN countries and India.

Way Forward:

➲ As a developing nation, India is currently dedicated to harnessing path-breaking innovations for comprehensive socio-economic growth. The ASEAN India partnership will enable concrete impact for this endeavor.

INDIA-MOZAMBIQUE-TANZANIA TRILATERAL EXERCISE (IMT TRILAT)

Why in news?

➲ Recently, the first edition of India-Mozambique-Tanzania Trilateral Exercise (IMT TRILAT), a joint maritime exercise among the Indian, Mozambique and Tanzanian navies held at Dar Es Salaam, Tanzania.

Objectives

➲ The exercise has three broad objectives:
a) capability development to address common threats through training and sharing of best practices,
b) enhancing interoperability, and
c) strengthening maritime cooperation.

Two phases:

➲ The exercise includes harbour and sea phases.

➲ As part of the harbour phase, capability building activities such as Visit, Board, Search and Seizure; small arms training; joint diving operations; damage control and fire fighting exercises; and cross deck visits are scheduled.

➲ The sea phase include boat operations, fleet manoeuvres, Visit, Board, Search and Seizure operations, helicopter operations, small arms firing, formation anchoring and EEZ patrols.

Way Forward:

➲ These exercises reflect India's and the Indian Navy's commitment to enhancing maritime security and cooperation with maritime neighbours in the Indian Ocean Region and promoting SAGAR, Safety and Growth for All in the Region.

ECONOMY

WORLD BANK CUTS INDIA'S GDP FORECAST TO 6.5%

Why in news?

➲ Recently, the World Bank downgraded India's GDP or gross domestic product to 6.5% for the fiscal year 2022-23 from an earlier estimate of 7.5%.

➲ In the previous year, the Indian economy grew by 8.7%.

Key Highlights:

➲ In its South Asia Economic Focus report, the World Bank said that the spillovers from the Russia-Ukraine war and global monetary policy tightening will continue to weigh on India's economic outlook.

➲ The global tightening of monetary policy that tightens financial markets and not just that it leads to capital outflows in many developing countries, but it also increases interest rates and uncertainty in developing countries which has a negative impact on investment

➲ The World Bank, however, said that India is recovering stronger than the rest of the world.

➲ The Indian economy has done especially well in the services sector and especially service exports.

Background:

➲ This is the third time the World Bank revised its GDP growth forecast for India in FY23. In June, it had slashed its forecast to 7.5%. Earlier in April, it had trimmed the forecast from 8.7% to 8%.

➲ Recently, the Reserve Bank of India (RBI) cut the economic growth projection for the current fiscal to 7% from the 7.2% estimated earlier on account

of extended geopolitical tensions and aggressive monetary policy tightening globally.

NO OIL PRODUCING AND EXPORTING CARTELS (NOPEC)

Why in news?

➲ The US legislation that could open members of oil producing group OPEC+ to antitrust lawsuits has emerged as a possible tool to tackle high fuel prices, after the body said it would slash production despite lobbying by the US administration.

➲ The No Oil Producing and Exporting Cartels (NOPEC) bill, which passed a Senate committee is intended to protect U.S. consumers and businesses from engineered oil spikes.

Background:

➲ OPEC+, which groups the Organization of the Petroleum Exporting Countries (OPEC) and 10 allied country, including Azerbaijan, Bahrain, Brunei, Kazakhstan, Malaysia, Mexico, Oman, Russia, South Sudan and Sudan, agreed to steep production cuts, curbing supply in an already tight market.

➲ The founding member Iran, Iraq, Kuwait, Saudi Arabia and Venezuela, established OPEC in 1960. OPEC has since expanded and now has 13 member states.

➲ Qatar terminated its membership on 1st January 2019.

➲ The objective of the organization is to "coordinate and unify the petroleum policies of its Member Countries and ensure the stabilisation of oil markets in order to secure an efficient, economic and regular supply of petroleum to consumers, a steady income to producers and a fair return on capital for those investing in the petroleum industry.

What is the NOPEC bill?

➲ The bipartisan NOPEC bill would tweak U.S. antitrust law to revoke the sovereign immunity that has protected OPEC+ members and their national oil companies from lawsuits.

➲ If signed into law, the U.S. attorney general would gain the option to sue the oil cartel or its members, such as Saudi Arabia, in federal court.

➲ It is unclear exactly how a federal court could enforce judicial antitrust decisions against a foreign nation.

➲ The United States could also face criticism for its attempts to manipulate markets by, for example, its planned release of 165 million barrels of oil from the emergency oil reserve between May and November.

➲ But several attempts to pass NOPEC over more than two decades have long worried OPEC's de facto leader Saudi Arabia, leading Riyadh to lobby hard every time a version of the bill has come up.

What's changed now?

➲ Previous versions of the NOPEC bill have failed amid resistance by oil industry groups, including the top U.S. oil lobby group, the American Petroleum Institute (API). But anger has risen in Congress about gasoline prices that earlier 2022 helped fuel inflation to the highest level in decades.

➲ Saudi Arabia has rebuffed repeated lobbying during visits by Biden officials not to cut production.

➲ Instead, OPEC+ agreed to cut output by the most since the start of the COVID-19 pandemic.

U.S. oil industry opposed:

➲ Lobby group API has long opposed NOPEC, saying it could hurt U.S. oil and gas producers.

➲ One industry concern is that NOPEC legislation could ultimately lead to overproduction by OPEC, bringing prices so low that U.S. energy companies have difficulty boosting output. Saudi Arabia and other OPEC countries have some of the world's cheapest and easiest reserves to produce.

➲ A wave of oil from OPEC producers, even at a time of concerns about Russian supply could chill U.S. drillers, some of which are already reluctant to boost output despite the cut.

➲ The United States and its allies are already facing big challenges securing imports of reliable energy supplies, especially as sanctions ramp up on Russia, one of the world's largest oil and gas suppliers, for its invasion of Ukraine.

COMMITMENT TO REDUCING INEQUALITY INDEX (CRII) 2022

Why in news?

➲ Recently, the Commitment to Reducing Inequality Index (CRII) was released.

➲ Norway leads the CRII followed by Germany and Australia.

What is CRII?

➔ The Index which is prepared by Oxfam International and Development Finance International (DFI) measures governments policies and actions in three areas proven to have a major impact on reducing inequality.

➔ The three areas are public services (health, education, and social protection), taxation and workers' rights.

➔ The 2022 CRII looks at government policies and actions in 161 countries to fight inequality during the first two years of the COVID-19 pandemic.

Key observations about India:

➔ India has moved up six places to rank 123 out of 161 countries for reducing inequality but continues to be among the lowest performers in health spending.

➔ India's overall rank has improved by six points from 129 in 2020 to 123 in 2022. It has moved up 12 places to rank 129 for reducing inequality through progressive spending.

➔ The country ranks 16 for progressive taxation, up by three.

➔ Under ranking for minimum wage, India has fallen 73 places due to the counttry being reclassified as not having a national minimum wage.

➔ Under the 'Impact of public spending on reducing inequality indicator', India has moved up 27 places and under 'Impact of tax on reducing inequality indicator', India has moved up 33 places.

➔ The 2022 CRII report shows India making marginal gains when it comes to reducing inequality during the COVID-19 pandemic.

Health spending by India:

➔ India features among the lowest performers on health spending again. The index showed that it has dropped a further two places in the rankings, to 157th, the 5th lowest in the world.

➔ India even made small cuts on health spending between 2019 and 2021 at a time of unprecedented health need and crisis.

➔ Given the wide criticism of the government's response to COVID-19 and the great need for healthcare improvements, it is disappointing to see that things are still moving in the wrong direction.

➔ India's health spending is 3.64 per cent of total spending. This is the lowest out of all BRICS and neighbouring countries, the report said.

➔ While China and Russia are spending 10 per cent, Brazil is at 7.7 per cent and South Africa is highest at 12.9 per cent. Even in neighbouring countries, Pakistan is at 4.3 per cent, Bangladesh at 5.19 per cent, Sri Lanka at 5.88 per cent and Nepal at 7.8 per cent.

National minimum wage:

➔ Twelve countries in the Index have no national minimum wage with India joining this list since 2020.

➔ India has been reclassified as not having a minimum wage, given that a large number of workers, like

domestic workers in many states, are not covered by minimum wages.

Conclusion:

➔ Despite huge pressure on government finances, 143 of 161 countries froze the tax rates on their richest citizens, and 11 countries even lowered them.

➔ The index shows that most governments have completely failed to take the steps needed to counter the inequality explosion created by COVID-19.

➔ They ripped away public services when people needed them most, and let billionaires and big corporations off the hook as they reap profits at record number.

PM DEDICATES 75 DIGITAL BANKING UNITS ACROSS 75 DISTRICTS
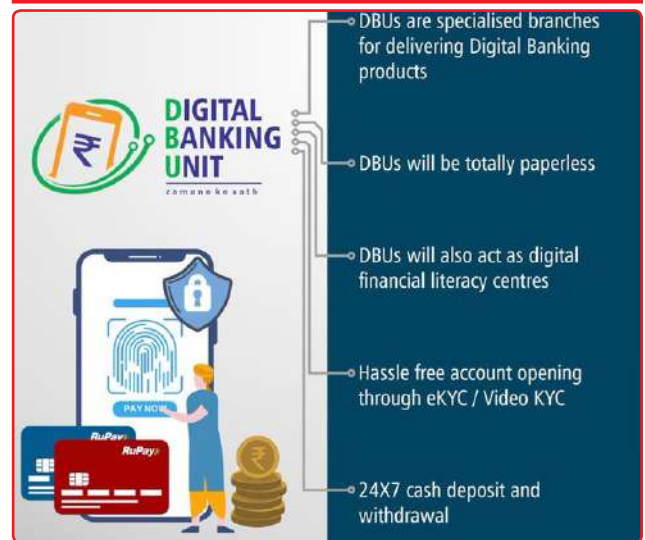
Why in news?

➔ Recently, the Prime Minister dedicated 75 Digital Banking Units (DBU) across 75 districts to the nation via video conferencing.

➔ He informed that in such a banking setup, the government aims to provide maximum services with minimum infrastructure, and all of this will happen digitally without involving any paperwork.

What is Digital Banking Units (DBU)?

➔ The DBUs will enable those who do not have ICT infrastructure to access banking services digitally.

➔ They will also assist those who are not tech savvy to adopt digital banking.

Modes:

➔ In DBU, the products and services will be offered to customers in 2 modes:

a) Self Service Mode

b) Digital Assistance Mode

DBUs will be different from traditional branch in following aspects:

➔ They will provide banking services including cash deposit & withdrawal 24 x 7.

- Services shall be provided digitally.
- People not having connectivity or computing devices can do banking transactions from DBU in a paperless mode.
- Bank staff will be available to help and guide users for banking transactions in assisted mode
- Will help in providing digital financial literacy and create awareness for adopting digital banking.

Services Offered:

- Services being offered through DBU include banking facilities like opening of savings account, balance-check, print passbook, transfer of funds, investment in fixed deposits, loan applications, stop-payment instructions for cheques issued, application for credit / debit cards, view statement of account, pay taxes, pay bills, make nominations, etc.
- The DBUs will also facilitate onboarding to Government credit link schemes through the Jan Samarth portal and end-to-end digital processing of a small ticket MSME/retail loans.

Background:

- As part of the Union budget speech for 2022-23, the Finance Minister announced setting up the 75 DBUs in 75 districts to commemorate our country's 75 years of independence.
- The DBUs are being set up with the objective to ensure the benefits of digital banking reach every nook and corner of the country and will cover all the States and Union territories.
- 11 Public Sector Banks, 12 Private Sector Banks and one Small Finance Bank are participating in the endeavour.

Significance:

- DBUs will enable customers to have cost-effective, convenient access and enhanced digital experience of banking products and services throughout the year.
- They will spread Digital Financial Literacy and special emphasis will be given to customer education on cyber security awareness and safeguards.
- Also, there shall be adequate digital mechanisms to offer real-time assistance and redress customer grievances arising from business and services provided by the DBUs directly or through Business Facilitators/ Correspondents.

SUGARCANE PRODUCTION IN INDIA SHIFTING FROM SOUTH TO NORTH: NSO REPORT

Why in news?

- Sugarcane production in India is experiencing a distinct shift from the South to the North, according to a latest National Statistical Office (NSO) report.

Key Findings:

- The six sugarcane producing Northern Indian states saw a 42 per cent increase in their sugarcane output value during the period between 2011- 2020 while output value of five sugarcane producing Southern states declined 32.4 per cent during the same period.

- The report shows that the cumulative production value of sugarcane in Bihar, Haryana, Punjab, Madhya Pradesh, Uttar Pradesh and Uttarakhand increased from Rs 302.16 billion to Rs 429.2 billion over the decade in real terms.
- Meanwhile sugarcane output in the five sugarcane producing Southern states of Andhra Pradesh, Karnataka, Telangana, Tamil Nadu and Maharashtra declined from Rs 268.23 billion to Rs 181.19 billion in the corresponding period.

Why Northward shift?

- This Northward shift in sugarcane production is on account of larger irrigated area in the North and higher State Advisory Price (SAP) over and above the centre's Fair and Remunerative Price (FRP) being offered especially by Uttar Pradesh.
- For example, the UP government pegged sugarcane SAP at Rs 340 per quintal in 2022 whereas sugarcane farmers in Tamil Nadu, Karnataka and Maharashtra are only able to realise prices in the range of Rs 280-310.
- Although Maharashtra is the leading sugar producer in the country, Uttar Pradesh has the highest sugarcane output value in the country.
- Uttar Pradesh alone accounts for around 83 per cent of the output value among the six northern states and it registered a growth of 43.9 per cent in its output value from Rs 248.6 billion to Rs 357.7 billion over the decade, as the sucrose levels in the sugarcane produced in the state continue to increase.
- Bihar, Punjab, Haryana and Uttarakhand also saw their output value increase by nearly 35, 30, 23 and 10 per cent respectively.

Output in Southern states:

- In the Southern states, Tamil Nadu saw the highest decline of nearly 66 per cent in the output value to Rs 18.55 billion, followed by Andhra Pradesh which saw a decline of nearly 63 per cent to Rs 7.3 billion.
- Barring Karnataka, which saw a marginal increase of 0.9 per cent in the output value, other sugarcane producing southern states like Telangana and Maharashtra also saw their output value decline by nearly 50 and 27 per cent respectively.

➲ Data sourced from the Reserve Bank of India shows total sugarcane production in the five Southern states has come down from 181.35 million tonnes to 130.65 million tonnes during the 2011- 2020 period while the production in the six Northern states has increased from 161.7 million tonnes to 222.51 million tonnes.

SECURITY

INDIA'S SUBMARINE-LAUNCHED BALLISTIC MISSILE TEST

Why in news?

➲ Recently, the INS Arihant carried out a successful test of a submarine-launched ballistic missile (SLBM) in the Bay of Bengal.

➲ The nuclear-powered submarine carried out the launch "very high accuracy".

Significance:

➲ The successful user training launch of the SLBM by INS Arihant is significant to prove crew competency and validate the SSBN programme, a key element of India's nuclear deterrence capability

➲ SSBN programme is a key element of India's nuclear deterrence capability.

➲ A "robust, survivable and assured retaliatory" capability is in sync with the country's policy to have 'credible minimum deterrence' that underpins its 'no first use' commitment.

India's SSBN programme:

➲ India's nuclear-powered ballistic missile submarine (SSBN) programme is a closely guarded project.

➲ INS Arihant was the first boat under the SSBN project that was reportedly followed by another boat, INS Arighat.

➲ Indian ballistic missile submarines may now be able to target China and Pakistan from underwater locations when deployed,

➲ The launch further shows the home-made INS Arihant class submarines are operational 'in all respects'.

About 'INS Arihant':

➲ INS Arihant is the first of three indigenously built nuclear submarines.

➲ The INS Arihant is designed to carry 12 K-5 or four K-4 missiles.

➲ The K-4 missile underwent its maiden test in January 2020 from a fixed underwater pontoon on the east coast. India is also working on a nearly 5,000-kilometre range missile called the K-5.

➲ The 6,000-tonne vessel was built under the Advanced Technology Vessel (ATV) project at the Ship Building Centre in the port city of Visakhapatnam.

Induction:

➲ INS Arihant, based on the Russian Akula-1 class submarine, was launched on July 26, 2009, the anniversary of Vijay Diwas (Kargil War Victory Day), by then prime minister Manmohan Singh.

➲ It was commissioned in 2016 by then defence minister Manohar Parrikar after a series of sea trials.

➲ Its induction into the Strategic Forces Command (SFC) was one of the biggest developments for the armed forces in the last decade. India completed the nuclear triad with its induction.

Nuclear triad:

➲ India is among just six countries in the world to have the capability to fire a nuclear missile from land, air and undersea.

➲ The others being the United States, Russia, China, France and the United Kingdom.

EXERCISE PRASTHAN

Why in news?

➲ Recently, an offshore security exercise, 'Prasthan' was conducted in the Krishna Godavari Basin Offshore Development Area (ODA) under the aegis of Headquarters, Eastern Naval Command.

Aim:

➲ Conducted every six months, this exercise is an important element of ensuring offshore security and aims to integrate the efforts of all maritime stakeholders involved in offshore defence.

Key Highlights:

➲ Led by the Navy, the exercise saw participation from the various oil operators, like ONGC, RIL, Vedanta, and other stakeholders in the domain of maritime security including AP Marine Police, AP fisheries department and the Coast Guard.

➲ The two-day exercise resulted in refining standard operating procedures (SOPs) and response actions to several contingencies in the Offshore Defence Area off Kakinada.

➲ Contingencies such as terrorist intrusion, bomb explosion, casualty evacuation, search and rescue, man overboard, major fire, oil spill and mass evacuation were exercised.

Way Forward:

➲ The exercise provided all stakeholders with a realistic opportunity to assess their readiness to respond and combat contingencies in the Eastern ODA, as also to operate together in a coordinated and synergised manner.

INDIA WILL EXPORT PINAKA ROCKET TO ARMENIA

Why in news?

➲ India is all set to export its indigenously-manufactured Pinaka rocket launcher to Armenia.

➲ Armenia has placed an export order to be completed within two years and Nigeria and Indonesia are in line to make a purchase.

About Pinaka Rocket launcher:

➲ The rocket launcher gets its name from the legendary bow of Shiva.

➲ It is a comprehensive system that integrates high energy propulsion, submunition warheads, servo-controlled launcher structure as well as fire control computer.

➲ The system is mounted on a Tatra truck for mobility.

Key features:

➲ The rocket launcher can fire 12 HE rockets in 44 seconds.

➲ It delivers lethal and responsive fire against a variety of area targets such as exposed enemy troops, armoured and soft skin vehicles, communication centres, air terminal complexes, fuel and ammunition dumps.

➲ It allows ground forces a deep strike option and is capable of hitting critical military installations.

➲ The Pinaka has six launchers that can neutralise an area measuring 1000 meters × 800 meters with a range of 60 to 75 kilometers, and a DIGICORA MET radar.

Deployment:

➲ It is designed to replace the Armenian Army's Russian-built BM-21 Grad launchers.

➲ The first Pinaka Mk1 Indian Army regiment was raised in February 2000.

➲ It has since been inducted into the Indian Army in large numbers, which is in the process of fielding 10 Pinaka Mk-1 regiments.

➲ The upgraded version of the Pinaka rocket launcher reportedly has a range in excess of 90 kilometers.

➲ It was also deployed more recently at India's border with China amid tensions over Ladakh.

Developed by:

➲ It was developed by the Defence Research and Development Organization (DRDO) based on an 8×8 vehicle.

➲ The Armament Research & Development Establishment (ARDE), Pune and High Energy Materials Research Laboratory (HEMRL), Pune also contributed to its development.

India's geopolitical play:

➲ India's move comes in the backdrop of Armenia being involved in a conflict with Azerbaijan (backed by Turkey, which has recently towed Pakistan's line on Kashmir).

➲ India earlier in October called for the "aggressor side" in fighting along the Armenia-Azerbaijan border to "immediately cease hostilities".

➲ The Pinaka MBRL would be extremely effective in any border conflict while targeting armoured formations But experts say the Pinaka rocket launcher alone may not be enough to tilt the balance decisively Armenia's way.

India's defence exports:

➲ India registered defence exports worth Rs 8,000 crore in six months of the current financial year and aims to achieve the target of outbound shipments of Rs 35,000 crore by 2025.

INDIGENOUS TRAINER AIRCRAFT HTT-40

Why in news?

➲ Recently, Prime Minister unveiled HTT-40, an indigenous trainer aircraft designed and developed by Hindustan Aeronautics Limited (HAL), at the India Pavilion during 12th DefExpo in Gandhinagar, Gujarat.

➲ The aircraft has state-of-the-art contemporary systems and has been designed with pilot-friendly features.

➲ With over 60 per cent in-house parts and collaboration of private industry, it is a shining example of the vision of 'Aatmanirbhar Bharat'.

Key Features:

➲ Built around a meticulously-tested turbo-prop engine, the aircraft is equipped with the latest avionics, an air-conditioned cabin and ejection seats.

➲ It boasts of unique features like running change-over of pilots, hot-refuelling and short-turnaround time.

➲ The HTT-40 would be used for basic flight training, aerobatics, instrument flying and close formation flights whereas its secondary roles would include navigation and night flying.

➲ It is a testament to the cutting-edge technology designed to meet primary training requirements of the Indian defence services.

Trials:

➲ All the tests required for certification were completed in record six years from the first flight.

➲ The HTT-40 has completed all systems tests, all PSQR performances, hot weather, sea level and cross wind trials and user assisted technical trials. It demonstrated rain water resistance.

➲ Provisional clearance for airworthiness of the aircraft is received from Centre for Military Airworthiness and Certification (CEMILAC).

THE C-295 TRANSPORT AIRPLANE TO BE MANUFACTURED IN GUJARAT

Why in news?

➲ Recently, the Prime Minister announced that the Indian Air Force's C-295 transport aircraft will be manufactured by a consortium led by Tata group and Airbus in Gujarat's Vadodara.

➲ For the first time, the Airbus C-295 aircraft will be manufactured outside of Europe. This is very significant for the domestic aerospace sector.

Salient Features of C-295:

➲ The C-295 is a new-generation tactical airlifter in the light and medium segment. This plane will replace the IAF's ageing Avro Hawker Siddeley HS748 aircraft of the Indian Air Force. The Avro has been in the IAF fleet since the 1960s.

➲ The C295 is known to be a superior aircraft used for tactical transport of up to 71 troops or 50 paratroopers, and for logistic operations to locations that are not accessible to current heavier aircraft.

➲ It has a maximum speed of 480 kmph.

➲ Moreover, the C-295 Short take-off and landing (STOL) capability combined with a strong landing gear enable it to operate in the most austere locations with the worst conditions for take-off and landings. This means it can operate from short or unprepared airstrips.

Variants:

➲ The plane can be transformed into several variants, including a water bomber, an air tanker (for air-to-air refuelling), for transporting VIPs and for medical evacuation, making it a huge asset for the IAF.

➲ Moreover, the C295 can operate in day and night conditions as well as all weather extremes, from desert to maritime environments, from extremely hot to extremely cold temperatures.

The C-295 deal:

➲ The Tata-Airbus plan is seen as a significant gain for Prime Minister's 'Make-In-India' campaign and will also take forward the agreement struck last year for 56 C-295MW aircraft.

➲ In September 2021, India had signed a Rs 21,935-crore deal with Airbus Defence and Space to procure 56 C-295 aircraft. As per the deal, 16 aircraft will be delivered in flyaway condition and 40 will be manufactured in India at the Vadodara facility.

➲ The Vadodara facility will be India's first private sector aviation manufacturing complex, breaking the monopoly of state-run Hindustan Aeronautics Ltd, the country's sole aircraft producer thus far.

Schedule:

➲ The first 16 planes are scheduled to be received between September 2023 and August 2025.

➲ The first Made-in-India aircraft is expected in September 2026. The eight aircraft per year would be manufactured in India, starting 2026.

➲ More than 125 micro, small and medium enterprise (MSME) suppliers in seven states will support the project and more than 4.25 million manhours of work will be generated.

➲ Apart from the 56 planes, the Vadodara facility, will be capable of meeting additional requirement of the Indian Air Force and also cater to export orders.

Way Forward:

- The project offers a unique opportunity for the Indian private sector to enter into technology intensive and highly competitive aviation industry.
- It will augment domestic aviation manufacturing resulting in reduced import dependence and expected increase in exports.

SINGAPORE-INDIA MARITIME BILATERAL EXERCISE 'SIMBEX' - 2022

Why in news?

- The Indian Navy is hosting the 29th edition of the Singapore-India Maritime Bilateral Exercise (SIMBEX) at Visakhapatnam.

Details:

- SIMBEX-2022 is being conducted in two phases – Harbour Phase at Visakhapatnam followed by the Sea Phase in Bay of Bengal.
- The Harbour Phase witnessed extensive professional and sporting interactions between the two navies including cross deck visits, Subject Matter Expert Exchanges (SMEE) and planning meetings.

About SIMBEX:

- SIMBEX series of exercises began in 1994 and were initially known as Exercise Lion King.
- The scope and complexity of the exercise has risen substantially over the past two decades to include advanced naval drills covering a wide spectrum of maritime operations.

Significance:

- The exercise exemplifies the high level of cooperation between India and Singapore in the maritime domain.
- It also highlights the commitment and contribution of the two nations towards enhancing maritime security in the Indian Ocean Region.

DELHI DECLARATION AT UN COUNTER-TERROR MEET

Why in news?

- The United Nations Security Council Counter-Terrorism Committee recently unanimously adopted the Delhi Declaration, focusing on countering the use of new and emerging technologies for terrorist purposes.
- It reaffirmed that terrorism in all forms and manifestations constitutes one of the most serious threats to international peace and security.

Focus themes:

- With the adoption of the Delhi Declaration, India decided to work on recommendations on the three themes of the CTC special meeting, namely —
a) Countering Terrorist Exploitation of ICT and Emerging Technologies,
b) Threats and opportunities related to new payment technologies and fundraising methods and
c) Threats posed by the misuse of unmanned aerial systems (UAS) by terrorists.

Concerns notes by Delhi Declaration:

- The declaration noted, with concern, the increased use of the internet and other information and communications technologies, including social media platforms, for terrorist purposes.
- It recognized that innovations in financial technologies such as crowdfunding platforms present a risk of being misused for terrorist financing.
- It also expressed concern over the increasing global misuse of Unmanned Aerial Systems (UAS) by terrorists to conduct attacks against critical infrastructure.
- In view of this, urged all member states to ensure zero tolerance towards terrorism, consistent with their obligations under international laws.

India's perspective:

- India, through the Delhi Declaration, emphasized the need for member states and CTED to continue voluntary cooperation with the private sector and civil society, including women and women's organizations, for more effective means to counter the use of new and emerging technologies for terrorist purposes.
- It recognized the efforts of the United Nations-affiliated Tech Against Terrorism initiative to foster collaboration with representatives of the technology industry, including smaller technology companies, civil society, academia, and governments, to disrupt

terrorists' ability to use the internet in furtherance of terrorist purposes, while also respecting human rights and fundamental freedoms; took note of the industry-led Global Internet Forum to Counter Terrorism (GIFCT) initiatives.

➲ India stressed the need to effectively counter the ways of ISIL, also known as Daesh and Al-Qaida, and their affiliates, to incite and recruit others to commit terrorist acts. Condemned the continued flow of weapons, military equipment, UAS and their components, and improvised explosive devices IEDs.

➲ India recognized the ongoing work of the Financial Action Task Force (FATF) concerning virtual assets and virtual assets service providers.

➲ FATF has taken action to respond to the very real risk that legitimate services offered by virtual asset service providers (virtual assets like blockchain, bitcoin, crypto assets, and virtual currencies) will be abused by criminals and terrorists to launder money and finance terrorist acts.

Conclusion:

➲ India expressed determination to contribute further to enhancing the effectiveness of the overall effort to fight this scourge on a global level.

➲ It reaffirmed that terrorism should not be associated with any religion, nationality, civilization, or ethnic group.

ENVIRONMENT

CHEETAH TASK FORCE CONSTITUTED

Why in news?

➲ Recently, the Ministry of Environment, Forest and Climate Change has constituted a Task Force for monitoring Cheetah introduction in Kuno National Park, Madhya Pradesh and other suitable designated areas.

Key Highlights:

➲ The National Tiger Conservation Authority (NTCA) would facilitate the working of Cheetah Task Force and render all necessary help.

➲ The Task Force shall be in-force for a period of two years.

➲ This task force may appoint a subcommittee to regularly visit the Cheetah introduction area as and when decided by them.

Cheetah restoration in India:

➲ Cheetah restoration is part of a prototype or model for restoration of original cheetah habitats and their biodiversity. This will help to stem the degradation and rapid loss of biodiversity.

➲ Bringing back a top predator restores historic evolutionary balance resulting in cascading effects on various levels of the eco-system. Bringing the cheetah back is expected to have important conservation ramifications.

➲ The cheetah has been the evolutionary natural selection force that has shaped the adaptation of high speeds in Indian antelopes and gazelles.

➲ By restoring cheetah, it would also be able to save not only its prey base comprising certain threatened species, but also other endangered species of the grasslands / open forest eco-systems, some of which are on the brink of extinction.

The Task Force has been constituted to:

a) Review, progress and monitor the health status of Cheetah, upkeep of the quarantine & soft release enclosures, protection status of entire area, adherence to the defined protocols by forest & veterinary officials and advice on Cheetah introduction in India to the Madhya Pradesh Forest Department and NTCA on status of Cheetah with respect to overall health, behavior and their upkeep.

b) Monitor hunting skills and adaptation of Cheetahs to the habitat of Kuno National Park.

c) Monitor release of Cheetah from Quarantine bomas to soft release enclosures and then to grass land and open forest areas.

d) Open Cheetah habitat for eco-tourism and suggest regulations in this regard.

e) Suggest and advice on development of tourism infrastructure in the fringe areas of Kuno National Park and other Protected Areas.

f) Regularly interact with Cheetah mitras and local communities for their awareness raising and also involvement in protection of Cheetahs in particular & area in general.

The members of the Task Force include:

➲ The nine member task force will include Principal Secretaries, Forests and Tourism of Madhya Pradesh, and the Inspector General of NTCA, New Delhi Dr. Amit Mallick.

Background:

➲ Eight cheetahs were brought to India from Namibia on September 17 2022 on Prime Minister Narendra Modi's birthday, 70 years after they were declared extinct in the country and were released in Madhya Pradesh's Kuno National Park in Sheopur and Morena districts.

MODHERA, INDIA'S FIRST SOLAR-POWERED VILLAGE

Why in news?

➲ Recently, the Prime Minister declared Modhera, a village in Mehsana district of Gujarat, as India's first solar-powered village.

➲ Modhera, which is associated with the Sun Temple will also be known for its strides in solar energy. Modhera will now be known as Suryagram.

➲ It is situated on the bank of the river Pushpavati. It was built after 1026-27 CE during the reign of Bhima I of the Chaulukya dynasty.

About the Project:

➲ The central and Gujarat government initiated the solarisation of Modhera Sun Temple and town to provide round-the-clock solar energy through a solar power project integrated with Battery Energy Storage System (BESS) at Sujjanpura in Mehsana, nearly 6 km away from the Sun Temple.

➲ The Gujarat government had allotted 12 hectares of land for the development of this project.

➲ An amount of Rs 80.66 crore was spent on a 50:50 basis by both the state and central government in two phases. The first phase constituted Rs 69 crore, and the second phase, Rs 11.66 crore.

Significance:

➲ As the people in Modhera would be saving 60% to 100% on electricity bills after using solar energy, now, they will not pay for electricity, but start selling it & earn from it.

➲ The government used to supply electricity to citizens till a while back but now citizens will be able to produce their own electricity.

'DRONI' CAMERA DRONE FOR FARMING SOLUTIONS

Why in news?

➲ Recently, Indian cricket star Mahendra Singh Dhoni has launched the made-in-India camera drone named 'Droni' with advanced features manufactured by Garuda Aerospace.

➲ Droni drone is indigenous and can be used for different surveillance purposes. It is efficient, seamless and high quality from a tech and builds standpoint.

Kisan drone:

➲ The event also witnessed the launch of a new 'Kisan Drone' that is aimed at the agriculture sector, particularly in spraying applications.

➲ This battery-powered drone is capable of carrying out agricultural pesticide spraying over a land area of 30 acres per day.

Garuda Aerospace:

➲ Dhoni is the brand ambassador of Garuda Aerospace, a company which has attempted to offer drone solutions for agricultural pesticide spraying, solar panel cleaning, industrial pipeline inspections, mapping, surveying, public announcements, and delivery services.

➲ It has ventured into the consumer drone market with 'Droni'.

Global Drone Expo:

➲ The Global Drone Expo in Chennai witnessed 1,500+ participants from 14 international drone companies and representatives from over 28 states and union territories which attracted investors, youth and stakeholders and outlined a path forward for the drone industry.

Way Forward:

➲ The product will be available in the market by the end of 2022.

sedaDNA CAN REVEAL HOW CLIMATE CHANGE WILL AFFECT ANTARCTICA

Why in news?

➲ Recently, Scientists have dug up fragments of deoxyribonucleic acid (DNA), in the Scotia Sea, north of the Antarctic continent. The DNA is a million years old and makes it possible to study the responses of ocean ecosystems to climate change.

➲ A study, conducted by researchers from University of Tasmania and University of Bonn discovered ancient sedimentary DNA (sedaDNA).

SedaDNA:

➲ SedaDNA analysis is a new technique that helps decipher 'who' has lived in the ocean in the past and 'when'.

➲ It can help study long-term responses of ocean ecosystems to climate change, as demonstrated by the study Ancient marine sediment DNA reveals diatom transition in Antarctica.

➲ The study can also help assess current and future changes in marine life around Antarctica.

Why focus is on Antarctica?

➲ Antarctica is one of the most vulnerable regions to climate change on Earth, so studying the frozen continent's past and present responses to environmental and climate change is therefore critical and urgent.

➲ Antarctica is arguably the most susceptible polar region to climate, evidenced in the fact that west Antarctica is one of the fastest-warming regions globally.

➲ Understanding how southern Ocean organisms respond to climate variability, including throughout past climate shifts, is thus of key importance to predict how the Antarctic marine ecosystem will evolve in the near future, the study added.

Key Findings:

➲ Amongst the detected organisms were diatoms as key primary producers whose DNA was detected back to half a million years.

➲ Diatoms were consistently abundant during warm climatic periods, showed data collected by the researchers. The last such change in the food web of the Scotia Sea occurred about 14,500 years ago.

➲ The warming apparently caused an increase in ocean productivity around Antarctica.

➲ The study demonstrates that marine sedaDNA analyses can be expanded to hundreds of thousands of years, opening the pathway to the study of ecosystem-wide marine shifts and changes to paleo-productivity throughout many ice-age cycles.

➲ These periods of natural climate change can also give insight into the current and future human-induced climate warming and how the ecosystem might respond to it.

Background:

➲ An international team studied sediments acquired during the International Ocean Discovery Program, an international, multi-drilling platform research program. The samples were collected in 2019 expedition 382, called Iceberg Alley and Subantarctic Ice and Ocean Dynamics.

➲ Investigation of characteristic age-related damage patterns in the recovered DNA fragments revealed they were as old as a million years.

TAMIL NADU NOTIFIES INDIA'S FIRST SLENDER LORIS SANCTUARY

Why in news?

➲ Recently, Tamil Nadu government notified Kaduvur Slender Loris sanctuary covering 11,806 hectares in Karur and Dindigul districts. It is India's first ever Wildlife Sanctuary for Slender Loris.

What is Slender Loris?

➲ Slender Loris is a small nocturnal mammal that spends most of its life on trees.

➲ They act as biological predators of pests that harm agricultural crops and help farmers.

➲ The species has a wide range of ecological roles and importance in the terrestrial ecosystem.

IUCN status:

➲ Slender Loris is listed as an endangered species according to the International Union for the Conservation of Nature (IUCN).

➲ The survival of the species depends on its habitat improvement, conservation efforts and mitigation of threats.

About Kadavur Slender Loris sanctuary:

➲ Realising the need for immediate conservation of this species, the State government identified forest areas measuring 11,800 hectares in Karur and Dindigul districts as important habitats.

➲ The Kadavur Slender Loris sanctuary is to cover Vedasandur, Dindigul East and Natham taluks in Dindigul district and Kadavur taluk in Karur district.

Background:

➲ Earlier in April, an announcement on the establishment of India's first wildlife sanctuary for Slender Loris in the State was made in the Legislative Assembly.

➲ Subsequently, the government has notified 'Kadavur Slender Loris sanctuary' under Section 26 (A)(1)(b) of Wildlife (Protection) Act, 1972.

Conservation landmarks in Tamil Nadu:

➲ In significant steps towards conservation of wildlife, Tamil Nadu government notified India's first Dugong Conservation Reserve in Palk Bay, Kazhuveli bird sanctuary in Villupuram and Nanjarayan Tank birds sanctuary in Tiruppur and the State's fifth elephant reserve at Agasthyamalai in Tirunelveli.

➲ Further, 13 wetlands across the State were declared as Ramsar sites.

➲ These pathbreaking initiatives in a short span of 15 months have put Tamil Nadu at a pivotal position in the field of conservation.

LIVING PLANET REPORT 2022: WILDLIFE POPULATIONS DECLINE BY 69% IN 50 YEARS

Why in news?

➲ There has been a 69 per cent decline in the wildlife populations of mammals, birds, amphibians, reptiles and fish, across the globe in the last 50 years, according to the latest 'Living Planet Report' by World Wide Fund for Nature (WWF).

➲ The Living Planet Index (LPI) featured about 32,000 populations of 5,230 species across the world.

Key Highlights:

➲ The highest decline (94 per cent) was in the Latin America and the Caribbean region.

➲ Africa recorded a 66 per cent fall in its wildlife populations from 1970-2018 and the Asia Pacific 55 per cent.

➲ Freshwater species populations globally reduced by 83 per cent, confirming that the planet is experiencing a biodiversity and climate crisis. Habitat loss and barriers to migration routes were responsible for about half of the threats to monitored migratory fish species.

➲ The vertebrate wildlife populations are plummeting at a particularly staggering rate in tropical regions of the world.

Threats to biodiversity:

➲ Biodiversity loss and climate crisis should be dealt with as one instead of two different issues as they are intertwined.

➲ WWF identified six key threats to biodiversity; agriculture, hunting, logging, pollution, invasive species and climate change to highlight 'threat hotspots' for terrestrial vertebrates.

Mangroves:

➲ Mangroves continue to be lost to aquaculture, agriculture and coastal development at a rate of 0.13 per cent per year.

➲ Many mangroves are also degraded by overexploitation and pollution, alongside natural stressors such as storms and coastal erosion.

➲ Mangrove-loss represents loss of habitat for biodiversity and the loss of ecosystem services for coastal communities. In some locations, it can mean the loss of the very land where coastal communities live.

➲ Around 137 square kilometres of the Sundarbans mangrove forest in India and Bangladesh has been eroded since 1985, reducing land and ecosystem services for many of the 10 million people who live there.

Way Forward:

➲ Climate change in India will impact key areas, such as water resources, agriculture, natural ecosystems, health and the food chain.

➲ There is need for an all-inclusive collective approach that can put us on a more sustainable path and ensures that the costs and benefits from our actions are socially just and equitably shared.

WWF'S DIET CHART TO HELP CURB CLIMATE CHANGE, BIODIVERSITY LOSS
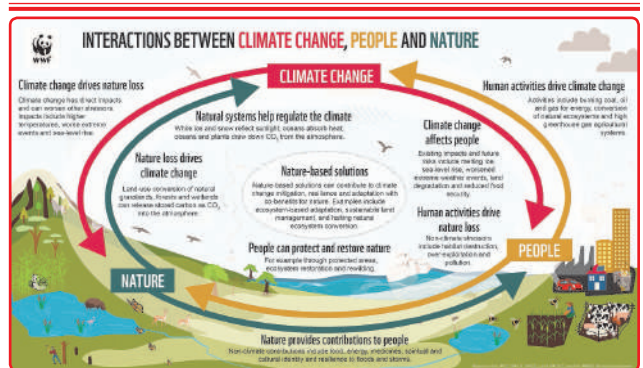
Why in news?

➲ On the occasion of World Food Day (October 16), World Wide Fund for Nature (WWF) outlined a sustainable diet plan that can help address a host of environmental challenges while also providing health benefits.

Details:

➲ The global food system is one of the primary drivers of biodiversity loss, with agriculture alone being the identified threat to 22,500 of the 41,000 species at risk of extinction.

➲ Cutting down on meat consumption can reduce global greenhouse gas emissions is well known. But global WWF says much more is needed to slow climate change and biodiversity loss.

➲ Wasting less food, looking out for eco-labels and following a more diverse diet can go a long way.

It encouraged the following consumption patterns:

Plant-heavy diet:

➲ Growing plants requires less water and land and emits lower volumes of greenhouse gases than meat, dairy and egg production.

➲ Incorporating more fruits, vegetables and wholegrains in our diet can reduce the impact our food system has on the environment.

Diversify the platter:

➲ Seventy-five percent of the global food supply comes from only 12 plant and five animal species.

➲ The global dependence on a small range of food threatens the diversity of species in agriculture, weakens our food systems and is also not the most nutritious.

Cut food waste:

➲ Planning meals, shopping smart and more efficient storage of food items can help reduce food waste.

➲ Nearly 570 million tonnes of the global food waste occurs at the household level.

Proteins beyond meat:

➲ Around 60 per cent of the greenhouse gas emission from agriculture is due to animal farming.

➲ Consuming more mushrooms, peas, beans and nuts to meet our protein requirements can help reduce this burden.

Pay attention to logos:

➲ Being aware of and choosing food packages based on eco-labels can go a long way.

➲ The organisation listed out some logos one can look for while grocery shopping. These include: Organic, Rainforest Alliance (for sustainable agriculture), Fairtrade (protecting farmers and workers in developing countries), Freedom Food (animal welfare), MSC and ASC (Marine stewardship council and Aquaculture Stewardship Council, for seafood) and RSPO (Roundtable for Sustainable Palm Oil).

➲ Fat, sugar, salt best avoided: Cultivation of sugarcane and sugar beet causes soil erosion and is often associated with intensive use of water and pesticides.

➲ Simple lifestyle choices such as choosing water over sugary drinks and saving cakes, sweets, chocolates, cured meat, fries and crisps for special occasions can make a significant difference. New sugar plantations are replacing natural habitats, leading to biodiversity decline.

Way Forward:

➲ The advantages of such a global shift towards the above diet are plenty.

➲ These include combating climate change and food insecurity, reducing biodiversity loss, improving human health, significantly reducing premature mortality and helping decrease the risks of future pandemics.

5TH ASSEMBLY OF THE INTERNATIONAL SOLAR ALLIANCE

Why in news?

➲ Recently, the Fifth Assembly of the International Solar Alliance (ISA) was inaugurated by Union Minister of Power and New & Renewable Energy in his capacity as the President, ISA.

➲ India holds the office of the President of the ISA Assembly, with the Government of France as Co-President.

About Assembly of the ISA:

➲ The Assembly is the apex decision-making body of ISA, in which each Member Country is represented.

➲ This body makes decisions concerning the implementation of the ISA's Framework Agreement and coordinated actions to be taken to achieve its objective.

➲ The Assembly meets annually at the ministerial level at the ISA's seat.

➲ It assesses the aggregate effect of the programmes and other activities in terms of deployment of solar energy, performance, reliability, cost, and scale of finance.

Agenda of Fifth Assembly of the ISA:

➲ The Fifth Assembly of the ISA will deliberate on the key initiatives of ISA on three critical issues energy access, energy security, and energy transition.

➲ The deliberations and discussions among representatives from 110 Member Countries are expected to lead to a greater consensus among the comity for promoting the deployment of solar power.

What is International Solar Alliance (ISA)?

➲ The ISA was conceived as a joint effort by India and France to mobilise efforts against climate change through the deployment of solar energy solutions.

➲ It was presented by the leaders of the two countries at the 21st Conference of Parties (COP21) to the United

Nations Framework Convention on Climate Change (UNFCCC) held in Paris in 2015.

- With the signing and ratification of the ISA Framework Agreement by 15 countries on 6 December 2017, ISA became the first international intergovernmental organisation to be headquartered in India.
- ISA is a coalition of solar resource rich countries lying fully or partially between the Tropic of Cancer and the Tropic of Capricorn to specifically address energy needs by harnessing solar energy.
- The Paris Declaration establishes ISA as an alliance dedicated to the promotion of solar energy among its member countries.

Significance:

- It works with governments to improve energy access and security worldwide and promote solar power as a sustainable way to transition to a carbon-neutral future.
- ISA's mission is to unlock US$ 1 trillion of investments in solar by 2030 while reducing the cost of the technology and its financing.
- It promotes the use of solar energy in the Agriculture, Health, Transport and Power Generation sectors.
- ISA member countries are driving change by enacting policies and regulations, sharing best practices, agreeing on common standards, and mobilising investments.

Way Forward:

- ISA is partnering with multilateral development banks (MDBs), development financial institutions (DFIs), private and public sector organisations, civil society, and other international institutions to deploy cost-effective and transformational solutions through solar energy, especially in the least Developed Countries (LDCs) and the Small Island Developing States (SIDS).

SIX NEW SPIDER SPECIES DISCOVERED IN INDIA

Why in news?

- Arachnologists from the Centre for Animal Taxonomy and Ecology (CATE), Christ College, Irinjalakuda, have discovered six new species of spiders from across the country.

Habitat:

- The new species of spiders were found from the Garo hills in Meghalaya, the Thar desert of Rajasthan, Wayanad Wildlife Sanctuary, Kottappara hills near Kothamangalam, Thumboormuzhi butterfly garden near Athirappilly, and the University of Calicut campus.

Genus Siamspinops in Garo hills:

- Studies conducted on the Garo hills of Meghalaya resulted in the first spotting of the genus Siamspinops from India with a new species Siamspinops garoensis.
- This belongs to the family of flat spiders, Selenopidae. This spider lives in the crevices of rocks on hills and its flat body is suitable for this mode of life.
- The yellowish brown spider measures about 10 mm in length. There is a black circle around its eyes and black patches on the abdomen. After mating, females lay eggs and incubate them in an egg sac.

Jumping spiders:

- Two new species of spiders coming under the family of jumping spiders (Salticidae) were discovered from the Thar desert of Rajasthan and the Kurichiyad forest ranges of the Wayanad Wildlife Sanctuary.
- Afraflacilla miajlarensis, the Thar species, is characterised by white fine hairs on a black head and black horizontal lines on the abdomen. This spider stays among dry leaf blades.
- Afraflacilla kurichiadensis, the Wayanad species, is characterised by red patches around the eyes and white hairs on the abdomen. The bulged first pair of legs are also a special feature of this species. This spider lives in the moist deciduous forest of Kurichiyad.

Feather- legged spiders:

- The next spider species lacks a venom gland and belongs to the family of feather- legged spiders (Uloboridae).
- This new species has been named as Philoponella rostralis, due to the presence of a beak like structure on the male reproductive organ.
- This spider makes a special type of web under the leaves and it can subdue the prey with the help of woolly silk produced from their cribellum (additional silk producing organ in front of the spinnerets).

Spiny-legged spiders:

- Two new species of spiders belonging to the family of spiny-legged spiders (Oxyopidae) have been discovered from the Thumboormuzhi butterfly garden, near the Athirappilly waterfalls, and on the Calicut University campus.
- The former one is characterised by a yellowish body and is named as Oxyopes peetham.
- The latter one has been named as Oxyopes thumboormuzhiensis, to signify the locality where the spiders were spotted.

◑ The members of this family are commonly known as lynx spiders because of their lynx-like feeding behaviour.

PM & UNSG LAUNCH MISSION LIFE AT STATUE OF UNITY, GUJARAT

Why in news?

◑ Recently, Prime Minister launched Mission LiFE (Lifestyle for Environment), in the presence of the UN Secretary General António Guterres, at the Statue of Unity, Ekta Nagar, Gujarat.

◑ First proposed by the Prime Minister at COP 26, Mission LiFE is envisioned as an India-led global mass movement that will nudge individual and collective action to protect and preserve the environment.

Concept:

◑ The Mission LiFE makes the fight against climate change democratic, in which everyone can contribute with their respective capacities.

◑ The Mission LiFE emboldens the spirit of the P3 model, i.e. Pro Planet People. It functions on the basic principles of 'Lifestyle of the planet, for the planet and by the planet'.

What is LiFE?

◑ The concept of LiFE was introduced by the Prime Minister at COP26 at Glasgow on 1 November 2021.

◑ It is also a part of India's nationally determined contributions (NDC).

◑ On 5 June 2022, on World Environment Day, India furthered the vision of LiFE by launching the LiFE Global Movement, inviting academicians, researchers and start-ups across the world to think about specific and scientific ways in which the full potential of collective action can be harnessed to address the environment crisis. The movement received record support from global leaders.

◑ Mission LiFE will action the ideas and ideals of LiFE through a mission-mode, scientific and measurable programme and demonstrate India's commitment to walk the talk on climate change.

Objective:

◑ Mission LiFE is designed with the objective to mobilise at least one billion Indians and other global citizens to take individual and collective action for protecting and preserving the environment in the period 2022 to 2027.

◑ Within India, at least 80% of all villages and urban local bodies are aimed to become environment-friendly by 2028.

Strategy:

◑ Mission LiFE aims at following a three-pronged strategy for changing people's collective approach towards sustainability.

◑ This includes nudging individuals to practice simple yet effective environment-friendly actions in their daily lives (demand), enabling industries and markets to respond swiftly to the changing demand (supply), and to influence government and industrial policy to support both sustainable consumption and production (policy).

◑ It includes an example of the adoption of LED bulbs in India for reducing electricity bills and protecting the environment. This led to massive savings and environmental benefits and this is a recurring permanent benefit.

India's initiatives:

◑ The annual per capita carbon footprint in India is only about 1.5 tonnes, compared to the world average of four tonnes per year. Nevertheless, India is working at the forefront to solve global problems like climate change.

◑ India is ranked fourth in wind energy and fifth in solar energy. India's renewable energy capacity has increased by about 290 per cent in the last seven-eight years.

◑ India have also achieved the target of achieving 40 per cent of the electric capacity from non-fossil-fuel sources nine years ahead of the deadline.

◑ India had also achieved a target of 10 per cent ethanol blending in petrol, and that too five months before the deadline.

◑ India has moved towards an environment-friendly energy source through the National Hydrogen Mission.

UTTAR PRADESH TO HAVE NEW ELEPHANT RESERVE

Why in news?

◑ The Union Ministry of Forest and Environment (MoFE) has given its nod to the Terai Elephant Reserve (TER), which will be set up over a 3,049.39-square kilometre area, including the Dudhwa Tiger Reserve (DTR) and the Pilibhit Tiger Reserve (PTR).

Details:

◑ With the TER coming into existence, the DTR would be the lone national park in Uttar Pradesh that would protect and conserve four iconic wild species; tiger, one-horned rhinoceros, the Asian elephant and swamp deer.

➲ Besides the Dudhwa and Pilibhit tiger reserves, the elephant reserve would comprise forest areas of the Kishanpur Wildlife Sanctuary (KWS), the Katarniaghat Wildlife Sanctuary (KGWS), the Dudhwa buffer zone and parts of the South Kheri forest division.

Elephant conservation:

➲ The establishment of the Terai Elephant Reserve will be a milestone in terms of wildlife conservation, particularly of the Asian elephants, as it is located on the India-Nepal border, where trans-border movement of elephants is a routine.

➲ The Centre would provide all financial and technical assistance under the Project Elephant, which would help handle human-elephant conflicts.

Significance:

➲ The establishment of the elephant reserve in Dudhwa would help adopt an elephant-centric approach towards their conservation.

➲ Also, the financial and technical aid received under the Project Elephant would be utilised in managing Dudhwa's camp elephants.

➲ The DTR has attracted wild elephants for decades through various domestic and trans-border corridors, including Basanta-Dudhwa, Laljhadi (Nepal)-Sathiyana and the Shuklafanta (Nepal)-Dhaka-Pilibhit-Dudhwa buffer zone corridor.

➲ With the Terai Elephant Reserve, incidents of man-elephant conflicts, which are presently state-dependent, would be handled more effectively.

ANTI-SMOG GUNS (ASG) FOR POLLUTION CONTROL

Why in news?

➲ As air quality deteriorates in the National Capital with the coming winter, the Delhi government has adopted several measures to keep a check on pollution.

➲ One such measure under the government's 15-point 'winter action plan' is making anti-smog guns mandatory for construction sites above 5,000 square metres (sqm).

➲ Moreover, these anti-smog guns are also being used on roads by the Public Works Department (PWD), especially at busy traffic crossings.

What are anti-smog guns?

➲ Shaped like a canon, anti-smog guns (ASG) spray tiny droplets of water into the atmosphere to reduce air pollution. The machine is mounted on a vehicle and connected to a water tank which can then be used to suspend particles and settle dust.

➲ The water, which passes through high-pressure propellers, is converted into a fine spray with the size of droplets ranging from 50-100 microns.

➲ Also known as a spray or mist gun or water cannon, the device binds dust particles and particulate matter (PM2.5 and PM10) in the atmosphere and brings them to ground level with the water to reduce air pollution.

➲ The gun makes a 'canopy effect' and is designed such that the water sprinkled from it can reach up to a height of 150 feet, creating artificial mist.

➲ According to Central Pollution Control Board (CPCB) guidelines, anti-smog guns "customised for urban areas" use 40 to 250 litres of water per minute depending on the type of the device.

➲ Treated sewage water should not be used in the anti-smog gun.

➲ This move is inspired by the Chinese water cannons that were used by the authorities there with some success. The idea is that it reduces air pollution by binding dust and other particulate matter, and bring them down to the ground level. This could be of use in an arid place like Delhi.

How effective are anti-smog guns in combating pollution?

➲ The experts say there are no studies to determine its impact yet, while most agree it has a limited impact.

➲ If the anti-smog gun is used along the roadside, the particulate matter may settle. It may reduce particulate pollution, but it is not a permanent solution. In emergency situations, where there is a fire or construction and demolition dust, this can be applied so that the situation is not aggravated in nearby areas. For the entire city, it is not possible. Water itself is an important resource.

➲ Further, the expert emphasised that the effectiveness of the gun needs to be monitored.

➲ Experts suggest acting at the "source of pollution" as anti-smog guns are used on a smaller scale.

Smog guns in Delhi:

➲ Earlier, only large construction sites of 20,000 sqm or above were required to install anti-smog guns, butin 2022, it has been made compulsory for smaller construction sites of 5,000 sqm and more.

➲ Sites bigger than 5,000 sqm have to deploy one anti-smog gun, while those over 10,000 sqm have to install two such guns.

➲ For sites bigger than 20,000 sqm, four anti-smog guns are compulsory.

➲ Besides being used on roads, anti-smog guns have also been placed on top of 10 buildings of around seven to ten storeys in the National Capital.

➲ Notably, these guns were recently used to settle the dust after the demolition of the Supertech twin towers in Noida's Sector 93A in August.

TWO NEW INDIAN BEACHES FROM LAKSHADWEEP RECEIVE 'BLUE FLAG' CERTIFICATION

Two Beaches From Lakshadweep "Minicoy Thundi Beach" & "Kadmat Beach" Are The New Additions To This List Of 'Blue Beaches' By The Foundation for Environment Education (FEE).

Why in news?

➲ Recently, two beaches from Lakshadweep; Minicoy Thundi Beach and Kadmat Beach were added to the list of 'Blue Beaches' by the Foundation for Environment Education (FEE).

Blue Beaches in India:

➲ With the new additions, India now has 12 beaches certified under the Blue Flag Certification.

➲ Last time it was in September 2021 when Kovalam Beach in Tamil Nadu and Eden Beach in Puducherry made it to the list.

➲ Apart from these Ghoghla Beach in Diu, Golden Beach in Odisha, Kappad Beach in Kerala, Kasarkod Beach in Karnataka, Padubidri Beach in Karnataka, Radhanagar Beach in Andaman and Nicobar, Rushikonda Beach in Andhra Pradesh, Shivrajpur Beach in Gujarat are also 'Blue Beaches'.

About 'Blue Beaches':

➲ It is an eco-tourism model endeavouring to provide the tourists/beachgoers clean and hygienic bathing water, facilities, a safe and healthy environment and sustainable development of the area.

➲ It is accorded by the international jury composed of eminent members - United Nations Environment Programme (UNEP), United Nations World Tourism Organisation (UNWTO), Denmark-based NGO Foundation for Environmental Education (FEE) and International Union for Conservation of Nature (IUCN).

➲ The certification is awarded to beaches, marinas (which are small ports or harbours designed for pleasure yachts or boats) and sustainable boat tourism operators in FEE member countries after they fulfil 33 criteria related to environment, education, access and safety.

➲ A total of 5042 sites are awarded certificates across 48 countries.

➲ Spain with 729 sites tops the list of countries with Blue Flag awarded sites. It is followed by Greece and Turkey with 591 and 560 sites respectively.

➲ India is placed at 36 spots.

THERMAL INVERSION & AIR POLLUTION IN DELHI

Context:

➲ Winter in Delhi is known for bad air quality, often leading to a surge in health issues. After recording the cleanest day post-Diwali in years, the National Capital's air quality again deteriorated to "very poor".

➲ While stubble burning, vehicular emissions and dust contribute to the toxic air in Delhi, factors such as change in weather conditions, temperature inversion, and wind direction also play a major role in the surge in pollution levels during winter.

What is the temperature or thermal inversion that affects Delhi in winter?

➲ Under normal conditions, the higher the altitude the lesser the temperature. But this phenomenon can change due to changes in weather and even topography.

➲ Temperature or thermal inversion is when the temperature increases along with the higher altitude.

➲ The cap is a layer of relatively warm air aloft (above the inversion). Air parcels rising into this layer become cooler than the surrounding environment, which inhibits their ability to ascend.

➲ The phenomenon mostly occurs in winter when "mist and fog become trapped in the cooler air low down", but inversions can happen throughout the year.

How thermal inversion affects pollution?

➲ As warm air rises, the air under the inversion cannot escape as it is cooler, and thus, it traps the pollutants closer to the ground, instead of dispersing them higher in the atmosphere.

➲ With a dip in temperature, the inversion height, the layer beyond which pollutants cannot diffuse into the upper layer of the atmosphere is lowered.

➲ The layer with "higher temperature acts as a cover on the colder air that is in contact with the ground and in which pollutants concentrate. This situation gives rise to the smog or "pollution beret", visible from several kilometers around and that usually takes prepared with a descent in the levels of air quality".

➲ This temperature inversion affects the pollution levels in Delhi every year during winter.

➲ Besides temperature inversion in the National Capital, the dip in wind speed during winter also leads to the concentration of pollutants in the air.

Delhi's pollution woes:

➲ The calm wind conditions are likely to continue in the National Capital and combined with the pollutants from the burning paddy fields in Punjab and Haryana, the air quality is expected to remain "very poor" till the end of October.

➲ The weather conditions can worsen in Delhi in the coming days. Till now, Delhi was seeing good wind speed, which was controlling the pollution levels. As soon as winds become calm, local emissions are enough to cause the AQI to reach 'very poor'.

SOCIAL ISSUES

TALAQ-E-KINAYA OR TALAQ-E-BAIN

Why in news?

➲ Recently, the Supreme Court issued a notice declaring all forms of unilateral extra-judicial Talaq including Talaq-e-Kinaya and Talaq-e- Bain" as void and unconstitutional.

➲ The decision came when a bench of Justices were hearing a Public Interest Litigation (PIL) filed by a doctor from Karnataka seeking the criminalisation of all forms of Talaq.

What was the PIL before SC?

➲ The petitioner, said in her PIL that she was married to her husband as per Muslim rites on October 22, 2020, and after the marriage, she was tortured physically-mentally by the husband and his parents for dowry.

➲ After the demands were not met by her family, the husband, also a doctor, gave her Talaq-E-Kinaya/ Talaq-E-Bain through a Qazi and lawyer.

➲ Talaq-e-kinaya/Talaq-e-bain (an instantaneous and irrevocable and extra-judicial form of talaq, in a single sitting, either pronounced or in written/electronic form) was given to her by her husband, she claimed.

Constitutionality:

➲ Talaq-E-Kinaya and Talaq-E-Bain are arbitrary irrational and not only contrary to Articles 14, 15, 21, and 25 of the Constitution of India but also totally against the international conventions on civil rights and human rights.

➲ Hence, the petitioner challenged the constitutional validity of Talaq-E-Kinaya and Talaq-E-Bain and also seeking direction to the Centre to frame "gender neutral religion neutral uniform grounds of divorce and uniform procedure of divorce for all citizens".

Uniform ground of divorce:

➲ The PIL also sought direction to the Centre to frame guidelines for "gender neutral religion neutral uniform grounds of divorce and uniform procedure of divorce for all citizens".

'CHILD MARRIAGE FREE INDIA' CAMPAIGN

Why in news?

➲ Recently, the Nobel Peace Laureate and child rights activist Kailash Satyarthi launched a nationwide campaign called 'Child Marriage Free India' to end the social evil of child marriage.

➲ The Kailash Satyarthi Foundation called the drive the "world's biggest-ever grassroots campaign against child marriage."

Details:

➲ The campaign that aims to raise people's awareness against child marriage was launched at a public

gathering at Navranpura village in Rajasthan's Vrat Nagar.

- Another Nobel Peace Laureate Leymah Gbowee who is from Liberia was among the attendees.
- As a part of the campaign, women and girls led people in lighting lamps, torchlight procession in around 10,000 villages (6,015 villages by KSCF and rest by government's and other agencies) from over 500 districts in 26 states.

Child marriage in India:

- The 2011 census reported over 12 million child marriages in the country, which is also supported by a study by National Family Health Survey. Out of 12 million child marriages, 5.2 million were girls.
- According to NFHS 23.3 percent of women between the ages of 20 to 24 are married before turning 18.
- The campaign launched by the Nobel Peace Laureate aims to reduce the number of child marriages by 10 percent from 23.3 percent.

Objectives:

- The 'Child Marriage Free India' campaign has set three objectives for realising an end to the practice of child marriage:
a) First, to ensure the strict implementation of the laws on the legal age of marriage and those protecting children against abuse.
b) Second, to enhance the social and economic participation of women and children and ensure their empowerment by giving them free education till the age of 18.
c) Third, to provide safety to children against sexual exploitation.

Way Forward:

- The child marriage is a violation of human rights and dignity, which unfortunately still has social acceptance.
- Child marriage has a serious impact on the education, health, and safety of our children. Elimination of child marriage has also been given priority in the Sustainable Development Goals (SDGs).

SCIENCE & TECHNOLOGY

NOBEL PRIZE 2022 IN MEDICINE

Why in news?

- Recently, Svante Paabo was awarded the 2022 Nobel Prize in Medicine for his extraordinary discovery which proved modern humans share DNA with extinct relatives Neanderthals and Denisovans.
- He sequenced the genome of the Neanderthal, an extinct relative of present-day humans, and made the sensational discovery of a previously unknown hominin, Denisova.
- Svante Paabo is the son of Sune Bergstrom, who won the Nobel prize in medicine in 1982.

THE NOBEL PRIZE IN PHYSIOLOGY OR MEDICINE 2022

Illustration: Niklas Elmehed

Research by Svante Pääbo:

- He sequenced the genome of the Neanderthal, an extinct relative of present-day humans. He also made the sensational discovery of a previously unknown hominin, Denisova.
- He also found that gene transfer had occurred from these now extinct hominins to Homo sapiens following the migration out of Africa around 70,000 years ago.
- This ancient flow of genes to present-day humans has physiological relevance today, for example affecting how our immune system reacts to infections.

About Nobel Prize in Medicine:

- A total of 112 Nobel Prizes in Physiology or Medicine have been awarded between 1901 and 2021, of which only 12 have been women.
- The prestigious award comes with a gold medal and 10 million Swedish kronor (over $1.14 million).
- The prize money comes from a bequest left by the prize's creator, Swedish inventor Alfred Nobel, who died in 1895.
- The other prizes are for outstanding work in the fields of physics, chemistry, literature, peace, and economics, which will be announced in the coming days over the span of a week.

YUNQING TANG BAGS SASTRA RAMANUJAN PRIZE 2022

Why in news?

- The SASTRA Ramanujan Prize for 2022 will be awarded to Yunqing Tang, Assistant Professor with the University of California, Berkeley, U.S.A.

What is SASTRA Ramanujan Prize?

- The award, instituted by the Shanmugha Arts, Science, Technology & Research Academy (SASTRA) in 2005 with a cash prize of $10,000.
- It is presented annually to individuals aged 32 and below, who made outstanding contributions in the field of mathematics, influenced by Srinivasa Ramanjuan in a broad sense.

Why she has been chosen?

- Her works display a remarkable combination of sophisticated techniques, in which the arithmetic and geometry of modular curves and of Shimura varieties play a central role, and her results and methods are bound to have major impact on future research in this area.

About Yunqing Tang:

- Ms. Yunqing, born in China, completed her B.Sc in Peking University in 2011, following which she went to Harvard University.
- She completed her Ph.D in 2016 at Harvard under the supervision of Mark Kisin. After stints in Princeton University, she joined UC Berkeley in July as Assistant Professor.

What's next?

- The prize will be awarded at the International Conference on Number Theory during December 20-22, at SASTRA University.

WHO WARNS OF 'WORRYING SURGE' IN CHOLERA CASES GLOBALLY

Why in news?

- Several countries across the world are in the grips of a cholera outbreak, with at least seven deaths recorded in Haiti for the first time in three years.
- Recently, the World Health Organization (WHO) warned of a "worrying surge" in cases, with 26 countries reporting outbreaks in 2022.
- Typically, less than 20 countries record cholera cases annually.

Case of Haiti:

- Haiti is a Caribbean country that shares the island of Hispaniola with the Dominican Republic to its east. The capital is Port-au-Prince.

- The health crisis in Haiti was compounded by a gang blockade following a fuel price hike resulting in a shortage of clean drinking water and fuel for medical facilities.

Factors responsible for cholera outbreak:

- Poverty, conflict and climate change are the key triggers for a cholera outbreak.
- Extreme climate events like floods, cyclones and droughts further reduce access to clean water and create an ideal environment for cholera to thrive.
- With climate change intensifying, such outbreaks are expected to increase in the coming future, he also warned.

Remedy:

- While the outbreak is worrying, the disease is easily treatable and preventable.
- Timely and proper administration of oral rehydration and intravenous fluids can keep the fatality below 1 per cent. In the absence of these steps, cholera can become fatal within hours.

Cholera cases in India:

- In India, the disease is endemic. Cholera cases in Maharashtra surpassed the 2021 figures, resulting in 261 cases and at least six deaths till July 2022.
- In 2011-2012, a dozen people had died of cholera. In July, the Puducherry health department declared a health emergency in the Karaikal district after 14 patients were admitted and 46 were getting treated in the district's community health centres and public health centres.

About Cholera:

- Cholera is an acute, diarrheal illness caused by infection of the intestine with the bacterium Vibrio cholerae.
- The infection is often mild or without symptoms, but sometimes can be severe.

Transmission:

- A person may get cholera by drinking water or eating food contaminated with the cholera bacterium.
- The highly liquid diarrhea during cholera infection is loaded with bacteria that can spread under unsanitary conditions to infect water used by other people.
- Cholera is transmitted from person to person through ingestion of faeces-contaminated water.

NOBEL PRIZE 2022 IN PHYSICS

Why in news?

- Recently, the Royal Swedish Academy of Sciences announced the winners of the 2022 Nobel Prize in Physics. It was given to Alain Aspect, John Clauser, and Anton Zeilinger for their work in quantum physics.
- The three newly awarded laureates experimented with entangled photons, establishing the violation of

Bell inequalities and pioneered quantum information science.

The Nobel Prize in Physics 2022

Ill. Niklas Elmehed © Nobel Prize Outreach
Alain Aspect
Prize share: 1/3

Ill. Niklas Elmehed © Nobel Prize Outreach
John F. Clauser
Prize share: 1/3

Ill. Niklas Elmehed © Nobel Prize Outreach
Anton Zeilinger
Prize share: 1/3
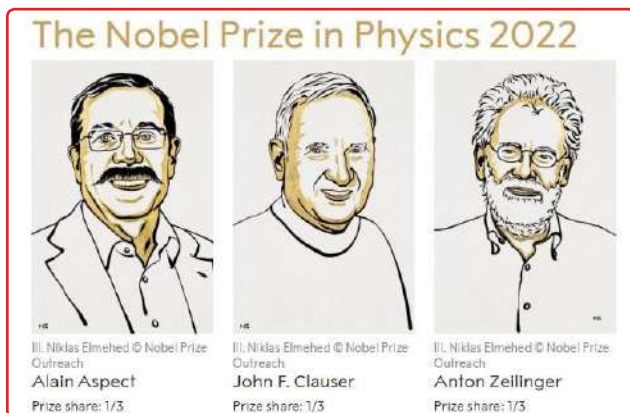
Focus area:

- At the heart of their research was quantum physics, a field of science that aims to study matter and energy at the most fundamental level.
- Each of the three winners conducted groundbreaking experiments using entangled quantum states, where two particles behave like a single unit even when they are separated.

Achievements of 2022 Winners:

- John Clauser built an apparatus that emitted two entangled photons at a time, each towards a filter that tested their polarisation. The result was a clear violation of a Bell inequality and agreed with the predictions of quantum mechanics.
- Alain Aspect developed a setup to close an important loophole. He was able to switch the measurement settings after an entangled pair had left its source, so the setting that existed when they were emitted could not affect the result.
- Anton Zeilinger researched entangled quantum states. His research group has demonstrated a phenomenon called quantum teleportation, which makes it possible to move a quantum state from one particle to one at a distance.

About Nobel Prize:

- The Nobel Prize is awarded under the will and testament of Alfred Nobel, who designated The Royal Swedish Academy of Sciences for the Nobel Prize in Physics and Chemistry, Karolinska Institutet for the Nobel Prize in Physiology or Medicine, the Swedish Academy for the Nobel Prize in Literature, and a Committee of five persons to be elected by the Norwegian Parliament (Storting) for the Nobel Peace Prize.

Nobel Prize in Physics

- In 2021 prize in Physics went jointly to Syukuro Manabe, Klaus Hasselmann, and Giorgio Parisi. While Syukuro Manabe was recognised for demonstrating how increased levels of carbon dioxide in the atmosphere lead to increased temperatures at the surface of the Earth, Klaus Hasselmann created a model that links together weather and climate.
- Meanwhile, Giorgio Parisi, a professor at Sapienza University of Rome was awarded the Nobel for discovering hidden patterns in disordered complex materials.
- So far, 115 Nobel Prizes in Physics have been awarded between 1901 and 2021, of which only four are women, which includes Marie Curie in 1903, Maria Goeppert-Mayer in 1963, Donna Strickland in 2018, and Andrea Ghez in 2020.
- The youngest person to win the Physics award has been Lawrence Bragg. He was 25 when he was given the 1915 Physics Nobel.

2022 NOBEL PRIZE IN CHEMISTRY

Illustrations: Niklas Elmehed

THE NOBEL PRIZE IN CHEMISTRY 2022

Carolyn R. Bertozzi   **Morten Meldal**   **K. Barry Sharpless**

"for the development of click chemistry and bioorthogonal chemistry"
THE ROYAL SWEDISH ACADEMY OF SCIENCES
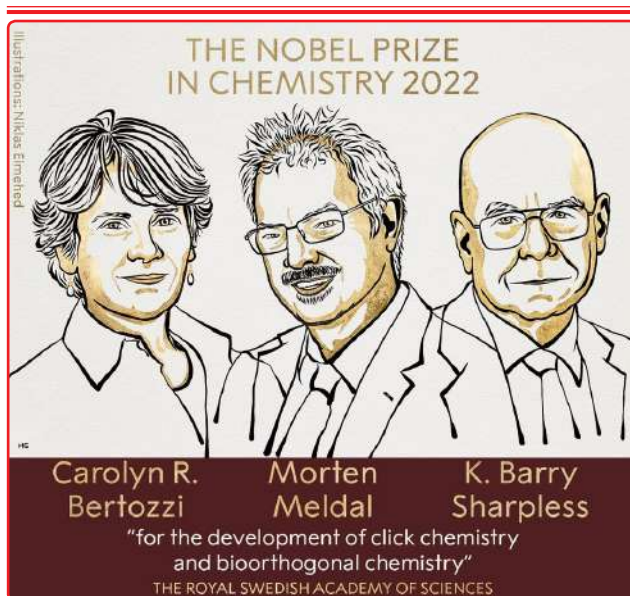
Why in news?

- Carolyn Bertozzi, Morten Meldal, and Barry Sharpless won the 2022 Nobel Prize in Chemistry for the development of click chemistry and bioorthogonal chemistry.
- While Barry Sharpless and Morten Meldal laid the foundation for a functional form of chemistry 'click chemistry' in which molecular building blocks snap together quickly and efficiently. Carolyn Bertozzi took it to a new dimension and started utilising it in living organisms.

Barry Sharpless wins the Nobel twice:

- Barry Sharpless was awarded the chemistry prize in 2001 and 2022. He last won the Nobel in 2001 for his work around chirally catalyzed oxidation reactions.
- Barry Sharpless is only the fifth person to be awarded two Nobel Prizes. He follows in the footsteps of double Nobel Prize laureates John Bardeen, Marie Skłodowska Curie, Linus Pauling and Frederick Sanger.

What is Click chemistry?

- Barry Sharpless laid the foundation for a functional form of chemistry in which molecular building blocks snap together quickly and efficiently.

- Around the year 2000, he coined the concept of click chemistry, which is a form of simple and reliable chemistry, where reactions occur quickly and unwanted by-products are avoided.

- Shortly afterwards, Meldal and Sharpless, presented the copper catalysed azide-alkyne cycloaddition.

- Azide is an organic compound with the formula N3 while an alkyne is a hydrocarbon containing at least one carbon-carbon triple bond.

- This is an elegant and efficient chemical reaction that is now in widespread use. Among many other uses, it is utilised in the development of drugs, for mapping DNA and creating materials that are more fit for purpose.

- To map important but elusive biomolecules on the surface of cells, glycans, Carolyn Bertozzi developed click reactions that work inside living organisms.

- These reactions are now used globally to explore cells and track biological processes.

- Using bioorthogonal reactions, researchers have improved the targeting of cancer drugs, which are now being tested in clinical trials.

About Nobel Prize in Chemistry:

- The Chemistry Nobel is awarded by the Royal Swedish Academy of Sciences as per the will of Alfred Nobel. So far, the committee has chosen 113 laureates in the field, of which seven have been women. Meanwhile, 25 chemistry prizes have been shared by two laureates.

- Frederick Sanger is the only person to have won the Chemistry prize twice, in 1958 and in 1980.

- The Nobel Committee in 2021 awarded the top award jointly to Benjamin List and David MacMillan for their development of a precise new tool for molecular construction: organocatalysis. The tool has had a great impact on pharmaceutical research and has made chemistry greener.

CHANDRAYAAN-2 FINDS ABUNDANCE OF SODIUM ON MOON FOR FIRST TIME

Why in news?

- The X-ray spectrometer 'CLASS' on the Chandrayaan-2 Orbiter has mapped an abundance of sodium on the moon for the first time, according to the Indian Space Research Organisation (ISRO).

Details:

- Chandrayaan-1 X-ray Fluorescence Spectrometer (C1XS) detected sodium from its characteristic line in X-rays which opened up the possibility of mapping the amount of sodium on the Moon.

- The Chandrayaan-2 mapped the abundance of sodium on the Moon for the very first time using CLASS (Chandrayaan-2 Large Area Soft X-ray Spectrometer).

- Built at the UR Rao Satellite Centre of ISRO in Bengaluru, CLASS provides clean signatures of the sodium line due to its high sensitivity and performance.

Sodium atoms on lunar surface:

- The study finds that a part of the signal could be arising from a thin veneer of sodium atoms weakly bound to the lunar grains.

- These sodium atoms can be nudged out of the surface by solar wind or ultraviolet radiation more easily than if they were part of the lunar minerals.

- Also shown is a diurnal variation of the surface sodium that would explain the continuous supply of atoms to the exosphere, sustaining it.

Exosphere:

- An interesting aspect that widens the interest in this alkali element is its presence in the wispy atmosphere of the moon, a region so thin that the atoms there rarely meet.

- This region, termed an 'exosphere', begins at the surface of the moon and extends several thousand kilometres merging into the interplanetary space.

Way Forward:

- The new findings from Chandrayaan-2, provide an avenue to study surface-exosphere interaction on the moon, which would aid development of similar models for mercury and other airless bodies in our solar system and beyond.

CHINA LAUNCHES KUAFU-1 SATELLITE TO UNRAVEL SECRETS OF THE SUN

Why in news?

- After successfully integrating its under-construction Space Station and approving the next phase of its lunar missions, China has launched a new observatory that will look into the Sun.

- The Advanced Space-based Solar Observatory (ASO-S) was launched onboard a Long March-2D rocke from the Jiuquan Satellite Launch Center in northwest China.

Key Highlights:

➲ Nicknamed Kuafu-1, after a giant in Chinese mythology who chased the sun, the observatory has been placed in an orbit about 720 kilometers above the planet, higher than the orbit of the International Space Station.

➲ With the satellite now placed into orbit, a six-month-long commissioning phase will begin, after which science operations will commence.

➲ The spacecraft will study the causality between the solar magnetic field and two major eruptive phenomena: solar flares and coronal mass ejections.

Instruments onboard:

➲ Kuafu-1 has been launched with three major instruments, which include the Lyman-alpha Solar Telescope (LST), the Hard X-ray Imager (HXI), and the Full-disk Vector MagnetoGraph (FMG).

➲ The scientific objective for the mission has been described as 1M2B, where M refers to the solar magnetic field and two Bs are for two violent bursts, the solar flares and coronal mass ejections (CMEs).

➲ The spacecraft will work for 96 per cent of the year, and since it is placed outside the planet, it will not be affected by Earth's atmosphere.

➲ ASO-S is capable of probing the Sun 24 hours daily for most of the year. Its longest daily time-out is no more than 18 minutes when briefly running through the shadow of Earth each day from May to August.

Significance:

➲ Designed to remain in service for four years, the mission will beam back about 500 gigabytes of data every day. China's new mission will reveal the secrets of the Sun and reveal new characteristics that propel solar flares and coronal mass ejections.

➲ Astronomers have long been trying to better understand these phenomena, which affect space weather and their understanding is critical to saving assets in space like the International Space Station and astronauts.

Similar missions by other nations:

➲ Kuafu is the fourth big mission exploring the Sun after Nasa Parker Solar Probe, which has been getting closer to the Sun alongside European Space Agency's Solar Orbiter and China's own Xihe probe, which was launched in 2021.

➲ India is also planning to launch a mission dedicated to the Sun, the Aditya L-1 mission will launch next year.

DENV-2

Why in news?

➲ The DENV-2 variant of dengue has been rapidly spreading in several parts of India for the past few months. The Post Graduate Institute of Medical Education and Research (PGIMER) has declared DENV-2 as a 'public health emergency'.

Average infection rate per tissue
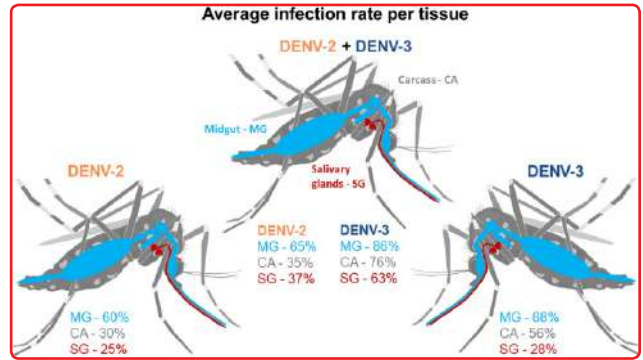
➲ The DENV-2 strain can be recognised by the early onset of severe symptoms. If the DENV-2 dengue virus is not treated on time, it can increase the chances of complications like dengue shock syndrome (DSS) and dengue haemorrhagic fever (DHF).

➲ The DENV-2 variant has caused a rapid surge in dengue fever and death cases in Panchkula, Haryana.

What is dengue?

➲ Dengue is a vector-borne disease or viral infection which is transmitted by mosquitoes caused by four serotypes of dengue viruses (DENV) -- DENV 1, DENV 2, DENV 3 and DENV 4, according to the World Health Organization (WHO).

➲ Dengue is found in tropical and sub-tropical climates worldwide, mostly in urban and semi-urban areas.

Dengue symptoms:

➲ The symptoms of dengue include high fever, vomiting, headache, rashes and muscle and joint pain.

➲ The dengue symptoms start to appear at least thirteen to fourteen days after the infection. The dengue virus causes a severe flu-like illness marked by extreme fatigue and painful joints.

➲ The disease occurs in two forms: dengue fever, a severe, flu-like illness, and Dengue Haemorrhagic Fever (DHF), a more severe form of the disease, which may cause death.

Transmission:

➲ Dengue is a viral mosquito-borne disease which is transmitted primarily by a female mosquito, Aedes Aegypti, and to some extent by A. albopictus.

➲ The human infections occur due to the bite of an infected mosquito (which is picked up while biting a dengue-infected person) and are sustained by human-mosquito-human transmission.

➲ A patient who has recovered from one serotype remains immune against it but is vulnerable to attack from the other three. Infection by other serotypes increases the risk of developing severe dengue.

Burden of Cases:

➲ A timely response is necessary for mitigating the social and economic costs of a dengue outbreak. Cases of vector-borne diseases are usually reported between July and November, but the period may stretch till mid-December.

- A person can be infected with dengue as many as four times due to the existence of different strains and subsequent infections are often more severe.
- Dengue infects about 390 million people a year globally and at least 96 million require treatment.

Tests:

- There are two kinds of tests for dengue -- direct tests, done through ELISA, to detect the presence of antibodies for dengue and a dengue PCR, which detects the genetic material of the dengue virus.

Dengue cure and treatment:

- The dengue virus requires strong management by medical professionals as there is no specific treatment for dengue or severe dengue. In fact, early detection of the disease, precautionary measu and access to proper medical care lowers the fatality rates of severe dengue to below 1 per cent.
- Dengue is a threat to almost half of the world's population and in some cases, the disease develops into dengue haemorrhagic fever, which leads to a sharp fall in blood platelets and can be life-threatening.

ROBOCAP COULD REPLACE INSULIN SHOTS

Why in news?

- Recently, researchers at the Massachusetts Institute of Technology (MIT) have developed a robotic pill.
- It could be used to orally administer large protein drugs such as insulin that consist of proteins or nucleic acids and are at the moment only injectable.
- RoboCap developed by MIT, has a robotic cap that tunnels through the mucus barrier after reaching the small intestine and allows the drugs to pass into cells lining the intestine.

Why it matters?

- Drug delivery has been one of the toughest breakthroughs in medical science, and there remain several barriers, which include surviving acidic regions in the stomach, digestive enzymes, and above all, the mucus barrier that lines the digestive tract.

How RoboCap works?

- Researchers have demonstrated that the unique pills could be used to deliver insulin as well as vancomycin, an antibiotic peptide that currently has to be injected.

- They designed the protective capsule to overcome the challenges faced inside the body by spinning and tunneling its way through.
- About the size of a multivitamin, the pill contains the drug in a small reservoir at one end and the spinning feature at the other. The capsule is coated with gelatin that can be tuned to dissolve at a specific pH.
- As the capsule dissolves, researchers said that the change in pH triggers a tiny motor inside the RoboCap capsule, which is coated with small studs to brush the mucus away, starts spinning. The spinning motion also helps to erode the compartment that carries the drug, which is gradually released into the digestive tract.

Outcome:

- They have tested the robotic pill on animals to deliver either insulin or vancomycin and found that they could deliver 20 to 40 times more drug than a similar capsule without the tunneling mechanism.
- Once the drug is released, the capsule passes through the digestive tract on its own, with no side effects noted so far.

Way Forward:

- The researchers are hopeful that it could also be used to target the stomach or colon by changing the pH at which the gelatin coating dissolves.

APPROVAL OF GM MUSTARD MAY THREATEN FOOD SECURITY

Why in news?

- Genetic Engineering Appraisal Committee (GEAC), which functions in the Union Ministry of Environment, Forest and Climate Change, might approve the commercial cultivation of modified mustard.
- This would be the first time since 2002 for such approval to grow GM mustard, a genetically modified hybrid variety of the mustard species, for consumption by the masses.

Concerns:

- Experts fear that such a move would have multiple repercussions for crop diversity and threaten food security as a whole.

➲ It could pose a threat to crop diversity, food security and increase tolerance for use of pesticides.

➲ The move might also severely affect the agrarian sector, as the seed market will be in the hands of private companies instead of farmers.

Green signal on GM Mustard:

➲ The decision on allowing GM mustard, also called DMH-11, is expected to be taken soon.

➲ The green signal for GM mustard was given by the central government in May 2017 after trials in Punjab Agricultural University (PAU) and Indian Agricultural Research Institute (IARI), New Delhi.

➲ However, it remained pending for approval from the environment ministry. The decision to approve it took a pause after activists and farmer bodies approached the Supreme Court to oppose the move.

➲ The Indian variety of GM Mustard was conceived in 2022 by Deepak Pental, the then-vice chancellor of Delhi University.

GM Mustard DMH-11

➲ Mustard is one of India's most important winter crops sown between mid-October and late November.

➲ It a self-pollinating crop difficult to hybridise naturally as it cross-pollinate.

➲ It is largest edible oil yielding crop of India.

➲ DMH (Dhara Mustard Hybrid)-11 is genetically modified variety of mustard developed by Centre for Genetic Manipulation of Crop Plants at Delhi University.

➲ It was Government sponsored project.

➲ But researchers at Delhi University have created hybridised mustard DMH-11 using "barnase / barstar" technology for genetic modification.

➲ It is Herbicide Tolerant (HT) crop.

➲ In February 2016, the Genetic Engineering Appraisal Committee (GMEC) had allowed the commercial production of another GM crop viz. Mustard DMH-11.

Issues raised by activists:

➲ The entire biosafety assessment of GM mustard has been unscientific and no guidelines have been followed. There have been irregularities and the need for certain tests has been unreasonably questioned and ignored.

➲ GM mustard is also a herbicide tolerant crop, which can become hazardous for the environment. The move will also pave the way for pesticide and insecticide tolerant companies.

Commercial cultivation:

➲ Once the GM mustard is approved, other crop varieties such as BT cotton, BT brinjal and HT cotton are in line for the nod for commercial cultivation.

➲ The move will definitely open Pandora's box for commercial use of GM seeds. Genetic modifications can have irreversible damage to the environment.

➲ Moreover, the government has been mulling over approval for genetic editing, which would not come under the purview of genetic modification.

Conclusion:

➲ Genetically modified seeds will also threaten crop biodiversity. Indigenous crop varieties may get threatened, which are crucial to fight climate change. If these varieties are lost, it would be a huge risk when the effects of climate change are worsening and food security is threatened.

➲ India is a growing economy and plays a crucial role in terms of food producers in the world. There is need to strengthen, conserve and preserve traditional seeds that would ensure food security. Bringing in GM seeds seems to be an unthoughtful and haphazard decision.

ISRO LAUNCHES 36 ONEWEB SATELLITES IN FIRST COMMERCIAL LAUNCH FOR LMV-3

Why in news?

➲ Recently, the heaviest rocket of the Indian Space Research Organisation– LVM3-M2/OneWeb India-1 blasted off from the second launch pad (SLP) of the Satish Dhawan Space Centre SHAR, Sriharikota has successfully orbited 36 satellites of U.K.-based OneWeb.

Many First's:

➲ It was also New Space India Ltd's (NSIL), the commercial arm of ISRO, first launch with the vehicle.

➲ It also became the first Indian rocket with a payload of 5,796 kg.

➲ The launch is also first for LVM3-M2 to place the satellites in the Low Earth Orbit (up to 1,200 kms above the earth) unlike Geosynchronous Transfer Orbit (GTO).

Geosynchronous Satellite Launch Vehicle (GSLV) Mark III rocket:

➲ The 36 communication satellites were placed into low-Earth orbit as part of the OneWeb India-1 mission or LVM3 (Launch Vehicle Mark III) M2 mission.

➲ This marked the maiden commercial launch of LVM3, India's heaviest launch vehicle, also known as GSLV Mark III.

- The 43.5 metre LVM3 weighing around 644 tonne carried 36 satellites weighing 5,796 kg or about 5.7 tonne.

Three stage:

- ISRO scientists have rechristened the launch vehicle its present name from GSLV-MKK III as the newest rocket is capable of launching 4,000 kilogram class of satellites into GTO and 8,000 kgs of payloads into LEO.
- LVM3-M2 is a three-stage launch vehicle consisting of two solid propellant S200 strap-ons on its sides and core stage comprising L110 liquid stage and C25 cryogenic stage.

OneWeb:

- NewSpace India Limited (NSIL), a central public sector enterprise under the Department of Space, had earlier signed two launch service contracts with the London-headquartered Network Access Associated Limited (OneWeb) for launching OneWeb LEO satellites on board ISRO's LVM3.
- OneWeb, formally known as Network Access Associates Ltd, is a joint venture between India's Bharti Enterprises and the UK government.
- OneWeb Ltd is a global communication network powered from space, enabling internet connectivity for governments and businesses.
- OneWeb Satellites are arranged in 12 orbital planes with 49 satellites in each plane at 1,200-kilometre circular orbit. The company is implementing a constellation of low earth orbit satellites and will have a total of 648 satellites.

Next missions of LVM:

- LVM's next mission will be for OneWeb only, next Chandrayaan-3 and after that Gaganyaan unmanned mission.
- The Chandrayaan-3 mission is India's third space venture targeting the moon. Though it was supposed to launch in late 2020 or early 2021, it was reportedly delayed due to the pandemic.

50 YEARS OF SAMPURNANAND TELESCOPE
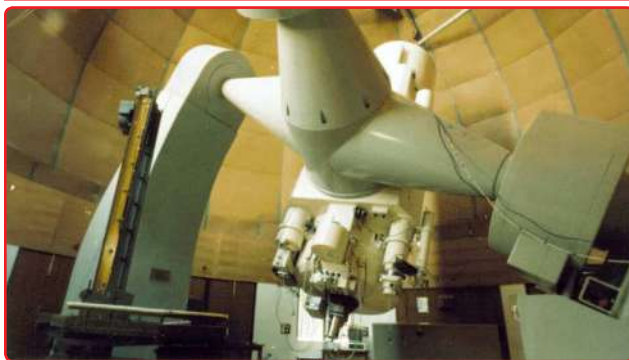
Why in news?

- Recently, 50 years of completion of 104 cm Sampurnanand Telescope (ST), a world-class telescope located near Nainital were commemorated.

About Sampurnanand Telescope:

- The telescope at Manora Peak was established in 1972 when ARIES was known as the UP State Observatory (UPSO).
- It has been extensively used for optical observations of comets, occultation by planets and asteroids, star-forming regions and star clusters, variable stars, transients, active galactic nuclei, etc.

Achievements:

- Some of the breakthrough science results contributed by the telescope include the discovery of new rings around Saturn and the rings of Uranus.
- The instrumentation and science capabilities of ST have paved the way for setting up National and International facilities by ARIES, such as the 3.6m DOT and the 4 meter International Liquid Mirror Telescope at Devasthal.

ISRO TO BOOST NavIC, WIDEN USER BASE OF LOCATION SYSTEM

Why in news?

- The Indian Space Research Organisation (ISRO) is working on a series of improvements to the NavIC, or India's equivalent of the Global Positioning System (GPS), so that more people are motivated to install it and use it.
- Plans are also afoot to make its reach global rather than circumscribe it to India and a limited territory around it.

What is NavIC?

- NavIC (Navigation with Indian Constellation), or the Indian Regional Navigation Satellite System (IRNSS), is a constellation of seven satellites that is akin to the American GPS, the European Galileo and the Russian GLONASS, and can be used to track location.
- The first of these satellites (IRNSS-1A) were launched in 2013 and the latest in 2018.
- Though available for use in mainland India as well as a range of 1,500 km around it, it isn't in wide regular use in India primarily because mobile phones haven't been made compatible to process its signals.
- The Indian government has been pressing manufacturers to add compatibility and has set a

deadline of January 2023 but media reports suggest this is unlikely before 2025.

Major changes:

➾ A major forthcoming change is to add the L1 band into NavIC. This bandwidth is part of the GPS and is the most used for civilian navigational use.

➾ Currently NavIC is only compatible with the L5 and S bands and hasn't easily penetrated into the civilian sector.

➾ The other major step would be to increase the "safety" of the signals. There's Long Code and Short Code. Currently (NavIC) only provides short code. This has to become Long Code for the use of the strategic sector. This prevents the signal from being breached. This had been part of the original scheme for NavIC but less work has gone into it so far.

Shortcomings:

➾ There are five more satellites in the offing to replace defunct NavIC satellites that would be launched in the coming months. However, to make NavIC truly "global" like GPS, more satellites would need to be placed in an orbit closer to earth than the current constellation.

➾ Currently, NavIC satellites orbit earth in a geostationary or geosynchronous (GEO) orbit, or about 36,000 km from earth. MEO orbits occupy a space between GEO and Low Earth Orbit (LEO), or about 250-2,000 km from earth.

INDIA'S FIRST INDIGENOUS OVERHAUSER MAGNETOMETER

Why in news?

➾ Indian scientists have developed an Overhauser Magnetometer, one of the most accurate magnetometers extensively used by all magnetic observatories around the world.

➾ In order to reduce dependence on imports, the Indian Institute of Geomagnetism (IIG) has developed the magnetometer as part of its technology development program.

OVH magnetometers:

➾ The sensor installed at Alibag Magnetic Observatory (MO) can absolve India's dependence on commercial OVH magnetometers for performing geomagnetic field measurements.

➾ OVH magnetometers are known for their higher accuracy, higher sensitivity, and efficient power consumption and hence find applications in all magnetic observatories worldwide as well as in international space programs. It has so far been imported for such purposes in India.

➾ They used various spectroscopic tools and theoretical simulations to understand the working of the OVH sensor.

➾ They further performed various control experiments, such as varying the sensor composition and examined the sensor's performance.

Results:

➾ Experiments with the sensor installed at the Alibag Magnetic Observatory (MO) for geomagnetic sampling found that the sensor reproduced the geomagnetic diurnal variations accurately and precisely showed the signatures of various space weather events such as geomagnetic storms, sudden impulses, etc.

➾ The performance of this indigenously made magnetometer is at par with a commercial OVH sensor that is currently installed at the magnetic observatories of IIG.

Way Forward:

➾ The sensor is currently being tested for its long-term stability. They are further excited to adapt their sensor for the outer space environment to support the existing Indian space research program.

➾ The understanding of this project, specifically the underlying mechanism of Dynamic Nuclear Polarization (DNP), would also be of potential help to develop a sensitive magnetic resonance imaging (MRI) instrument.

ISRO TO DEVELOP REUSABLE ROCKET FOR HEAVIER PAYLOADS BY 2035

Why in news?

➾ As India eyes setting up its own space station by 2035, the Indian Space Research Organisation (ISRO) has proposed to the industry to collaborate with it in developing a reusable rocket capable of carrying heavier payloads into orbit.

➲ Dubbed as the Next-Generation Launch Vehicle (NGLV), ISRO was working on the design of the rocket and would like the industry to collaborate with it in the development.

Key Highlights:

➲ The rocket is planned to carry a 10 tonne payload in the Geostationary Transfer Orbit (GTO) or 20 tonnes to the low earth orbit.

➲ The new rocket would be helpful as India plans to have its own space station by 2035 and was also eyeing deep space missions, human space flights, cargo missions and putting multiple communication satellites into orbit at the same time.

➲ The NGLV could be a three-stage rocket powered by green fuel combinations such as methane and liquid oxygen or kerosene and liquid oxygen.

➲ The NGLV could offer launch costs of USD 1900 per kg of payload in the reusable form and USD 3,000 per kg in the expendable format.

India's space economy:

➲ India's space economy was pegged at USD 9.6 billion in 2020 and is expected to touch USD 12.8 billion by 2025, according to the ISpA-E&Y report titled 'Developing the Space Ecosystem in India: Focusing on Inclusive Growth'.

➲ In dollar terms, the satellite services and applications segment would be the largest with a turnover of USD 4.6 billion by 2025, followed by ground segment at USD 4 billion, satellite manufacturing at USD 3.2 billion and launch services at USD 1 billion.

➲ India's share in the launch services segment was pegged at USD 600 million in 2020 and is projected to grow at a compound annual growth rate of 13 per cent to reach USD 1 billion by 2025.

Way Forward:

➲ The Polar Satellite Launch Vehicle (PSLV), ISRO's warhorse rocket, was based on the technology developed in the 1980's and cannot be used to launch rockets in the future.

➲ The NGLV is envisioned as a simple, robust machine designed for bulk manufacturing that will make space transportation more cost effective.

➲ ISRO plans to have the design of the NGLV ready within a year and offer it to the industry for production, with the first launch tentatively scheduled for 2030.

CULTURE

FIRST PRIME MINISTER TO ATTEND KULLU DUSSEHRA

Why in news?

➲ In the nearly 400 years of the history of the world-famous weeklong Kullu Dussehra festivities, Narendra Modi became the first Prime Minister to pay obeisance to Kullu Valley's chief deity Lord Raghunath in the festivity that begin in this Himachal Pradesh hill town.

➲ Lord Raghunath's chariot was wheeled out from the historical temple in Sultanpur on the first day of Dussehra or Vijay Dashami, the day when the festivities end in the rest of the country.

NARENDRA MODI FIRST PM TO ATTEND HISTORIC KULLU DUSSEHRA

Background:

➲ The Kullu Dussehra festival concludes with the 'Lanka Dahan' ritual on the banks of the Beas river. All the assembled deities will participate, before they are carried back to their own temples in a beautifully decorated palanquin.

➲ The festival traces its origin to 1637 when Raja Jagat Singh ruled Kullu. He had invited all local deities in Kullu to perform a ritual in honour of Lord Raghunath during Dussehra. Since then, the annual assembly of deities from hundreds of village temples has become a tradition.

➲ After the abolition of the Indian princely states, the district administration has been inviting the deities.

➲ According to a reference book compiled by the Kullu administration, there are 534 'living' gods and goddesses in the Kullu Valley, which is popularly known also as Devbhoomi or abode of gods.

New projects inaugurated:

AIIMS Bilaspur:

➲ In a bid to boost the medical infrastructure of the hilly state, the PM inaugurated the newly constructed AIIMS Bilaspur, the foundation stone of which was laid by him back in 2017.

➲ Constructed at a cost of about Rs 1,470 crore, the hospital is equipped with 18 specialities and 17 super-speciality departments along with 18 modular operation theatres.

➲ A project that was undertaken under the Pradhan Mantri Swasthya Suraksha Yojana, AIIMS Bilaspur has a capacity of 750 beds out of which 64 are Intensive Care Unit (ICU) beds.

➲ The hospital will not only increase access to affordable healthcare but is also eco-friendly. The AIIMS Bilaspur will be known as 'Green AIIMS.'

Medical Device Park:

➲ In March, the Himachal Pradesh Industries Department signed 15 Memorandum of Understanding

(MoUs) with potential investors to build a Medical Device Park (MDP) in Nalagarh in Solan district.

➲ The MDP will enable the state to manufacture its own health equipment. The park will cover an area of 265 hectares.

➲ The project, which will be built at a cost of about Rs 350 crore, will also include the setting up of a Centre of Excellence of CiBiod PGIMER.

What's next?

➲ The festival will be celebrated from 5 October to 11 October 2022.

MAWMLUH CAVE ON UNESCO'S 'FIRST 100 IUGS GEOLOGICAL SITES' LIST
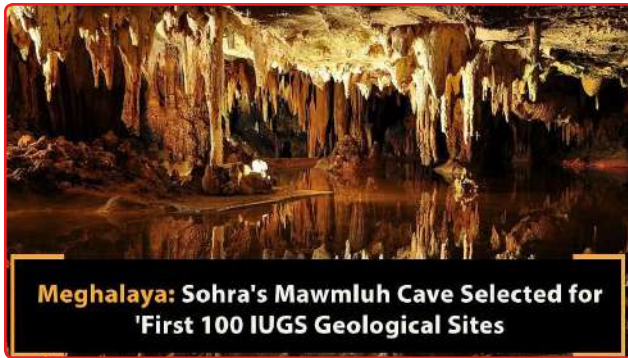
Meghalaya: Sohra's Mawmluh Cave Selected for 'First 100 IUGS Geological Sites

Why in news?

➲ Meghalaya's Mawmluh Cave is now on the United Nations Educational, Scientific and Cultural Organisation's (UNESCO) 'First 100 International Union of Geological Sciences (IUGS) Geological Sites' list.

➲ The caves, which are also called Krem Mawmluh, are the fourth longest in the Indian subcontinent.

What is IUGS?

➲ The International Union of Geological Sciences was founded in 1961 with 121 national members. The organisation is represented by over a million geoscientists and is one of the World's largest scientific organisations.

➲ The IUGS Secretariat is headquartered in Beijing.

➲ It collaborates with other organisations to work on topic-specific Commissions, Task Groups, Initiatives and Joint Programmes.

➲ This year the organisation celebrated its 60th anniversary. The celebrations were supposed to take place in 2021 but were postponed due to the pandemic.

Activities:

➲ Among its many tasks, the organisation encourages international co-operation and participation in Earth Sciences to give a boost to human welfare.

➲ With an aim to foster dialogue and communication among different parties who specialise in earth sciences, IUGS organises international projects and meetings, sponsors symposia and scientific field trips as well as produce publications.

➲ Currently, IUGS is involved in a wide range of activities like identifying the problems of terrestrial and planetary geological processes, encouraging innovations to test new geological concepts, models and methodologies, among other things.

What is an IUGS Geological Heritage Site?

➲ An IUGS Geological Heritage Site is a key place with geological elements and/or processes of scientific international relevance, used as a reference, and/or with a substantial contribution to the development of geological sciences through history.

➲ Under the list, all kinds of geological sites like tectonic, stratigraphical, sedimentological, petrological, mineralogical, hydrogeological paleontological, geomorphological and those related to the history of geological sciences, are considered.

➲ The scientific community has long demanded the establishment of a global standard for the recognition of geological sites of high international importance.

What makes Mawmluh Cave so special?

➲ Mawmluh Cave is located about 60 km away from Shillong and was first explored by a British official named Lieutenant Yule back in 1844.

➲ The cave is named after a small hamlet in Meghalaya. It is the fourth longest cave in the Indian subcontinent with a total length of seven kilometre of cave passages.

➲ Mawmluh caves contain passages, calcite formations of various kinds and huge caverns. Only one-fourth of the cave is exposed to sunlight while the rest of the cave is shrouded in complete darkness.

➲ The entrance is located at a height of 10 feet above sea level and is covered with stalagmite structures and other rock formations. There's a deep pool inside the cave which is formed by five different rivers.

➲ Researchers from the US studied the growth of stalagmite in the last 50 years. They found that it is one of the major reasons why Meghalaya is known to be the rainiest place on earth.

➲ Scientists are also studying the stalagmite deposits to help predict monsoon patterns and droughts.

What other places are on the IUGS list?

➲ IUGS saw the nomination of 181 candidates from 56 countries.

➲ Two geological sites from Greece have made it to the list: The Petrified Forest of Lesvos and Volcanic Caldera of Santorini.

➲ The Petrified Forest is a rare fossil forest ecosystem that includes large concentrations of petrified trees and animal fossils that were covered with volcanic material 18 million years ago.

➲ The shape of Volcanic Caldera was formed more than 3500 years ago, when a volcanic eruption changed the Mediterranean topography forever. The site sees thousands of tourists every year who come to witness the beauty of the place.

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MISCELLANEOUS

HYDERABAD BAGS WORLD GREEN CITY AWARD 2022

Why in news?

➲ Hyderabad has won the overall World Green City Award 2022 and another in the category Living Green for Economic Recovery and Inclusive Growth at the International Association of Horticulture Producers (AIPH) 2022.

➲ World Green City Awards 2022 held in Jeju, South Korea.

Details:

➲ Hyderabad is the only Indian City that was selected and it is a matter of pride for Telangana and India that has won not only the category award but the overall World Green City 2022 award, the best across all 6 categories.

➲ It is a matter of pride that Hyderabad is the only city from India to be selected for these international awards.

➲ The city of Hyderabad has bagged the prestigious award beating Paris, Bogota, Mexico City, Montreal, and Fortaleza in Brazil.

Here's a list of other cities that won the AIPH awards in different categories:

➲ Living Green for Biodiversity: Reverdecer Bogotá, Bogota D.C, Colombia.

➲ Living Green for Climate Change: Mexico City's Environmental and Climate Change Program, Mexico City, Mexico.

➲ Living Green for Health and Wellbeing: Transforming degraded land into Urban Micro Parks, City of Fortaleza, Brazil.

➲ Living Green for Water: The Phytotechnology Stations at the Montréal Botanical Garden / Space for Life, City of Montreal, Canada.

➲ Living Green for Social Cohesion: OASIS Schoolyard Project, City of Paris, France.

➲ Living Green for Economic Recovery and Inclusive Growth: Green Garland to the State of Telangana, City of Hyderabad.

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About AIPH World Green City Awards:

➲ The AIPH World Green City Awards are designed to champion ambitious nature-orientated approaches to city design and operation.

➲ Specifically, they seek to recognise public initiatives relying on a greater use of plants and nature to create better city environments, helping to fulfil local aspirations for improved economic, social and environmental resilience.

2022 NOBEL PRIZE FOR LITERATURE

Why in news?

➲ French author Annie Ernaux has been awarded the Nobel Prize in Literature for 2022.

➲ She is the 17th woman to win the prestigious prize, out of 119 literature laureates since the first Nobel was awarded in 1901.

About Annie Ernaux:

➲ She has written more than 20 books, most of them very short, and chronicle events in her life and of those around her. They present uncompromising portraits of sexual encounters, abortion, illness and the deaths of her parents.

➲ Her debut was Les armoires vides (1974; Cleaned Out, 1990).

➲ She is known for her deceptively simple novels drawing on personal experience of class and gender. She started out writing autobiographical novels, but soon abandoned fiction in favor of memoirs.

Nobel Prize in Literature in 2021:

➲ In 2021, the award went to Tanzanian-born novelist Abdulrazak Gurnah, whose work focuses on the plight of refugees and exile, colonialism and racism.

➲ The award was postponed in 2018 after sex abuse allegations rocked the Swedish Academy, which names the Nobel literature committee, and sparked an exodus of members.

➲ The academy revamped itself but faced more criticism for giving the 2019 literature award to Austria's Peter Handke, who has been called an apologist for Serbian war crimes.

Way Forward:

➲ Annie Ernaux will receive the Nobel from King Carl XVI Gustaf at a formal ceremony in Stockholm on

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10 December, the anniversary of the 1896 death of scientist Alfred Nobel who created the prizes in his last will and testament.

MP TO BE FIRST STATE TO HAVE MEDICAL EDUCATION IN HINDI
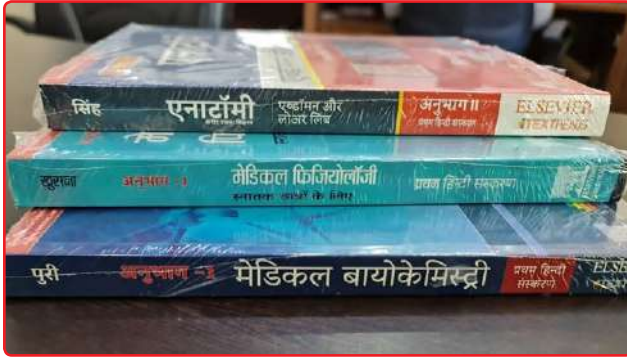
Why in news?

⮑ Recently, the Union Home Minister Amit Shah launched of first Hindi MBBS textbooks in Bhopal.

⮑ Madhya Pradesh is the first state in the country to start the MBBS course in the Hindi language.

Key Highlights:

⮑ Initially, three subjects have been selected to be studied in Hindi, which include Anatomy, Physiology and Biochemistry.

⮑ A team of 97 experts have been working on the preparation of books for the last 232 days at Gandhi Medical College, Bhopal. They have been translating the book from English to Hindi.

New editions:

⮑ The new edition of Medical Biochemistry contains the application of some new chapters which include Sodium, Potassium, Water Homeostasis, Biochemistry Techniques, Radiation, Radioisotopes and Environmental Pollutants and Toxins.

⮑ Besides, several new line diagrams, tables and text boxes have been added to make information more memorable.

⮑ Similarly in the Anatomy edition, new chapters of surface anatomy have been added in both the abdomen and lower limb sections. New line diagrams, CT and MRI diagram tables and flow charts are added to increase the retention of knowledge.

Way Forward:

⮑ Uttar Pradesh is also following suit by providing Medical and Engineering education in Hindi.

SRI LANKA'S SHEHAN KARUNATILAKA GETS BOOKER PRIZE

Why in news?

⮑ Recently, Sri Lankan novelist Shehan Karunatilaka has won the Booker prize 2022 for fiction.

Details:

⮑ He received his trophy from Queen Consort Camilla at the English language literary award's first in-person ceremony since 2019.

⮑ He also got a 50,000 pound ($56,810) prize.

Award winning book:

⮑ He won the award for his book, 'The Seven Moons of Maali Almeida'.

⮑ The Booker-winning novel tells the story of a dead war photographer on a mission in the afterlife.

⮑ Set in 1990 Sri Lanka during the country's civil war, Karunatilaka's second novel follows gay war photographer and gambler, Maali Almeida, who wakes up dead.

⮑ Time is of the essence for Maali, who has "seven moons" to reach out to loved ones and guide them to hidden photos he has taken depicting the brutality of his country's conflict.

About Booker Prize:

⮑ Founded in 1969, the Booker Prize has a reputation for transforming writers' careers.

⮑ It was originally open to British, Irish and Commonwealth writers but eligibility was expanded in 2014 to all novels in English published in the U.K.

⮑ Past winners of the Booker Prize, which was first awarded in 1969, include Margaret Atwood, Salman Rushdie and Yann Martel.

EU CONFERS THE SAKHAROV PRIZE 2022 TO 'BRAVE PEOPLE' OF UKRAINE

Why in news?

⮑ Recently, the European Parliament awarded its annual Sakharov Prize for 'Freedom of Thought',

a prestigious human rights prize to the Ukrainian people to honour their ongoing fight against the Russian invasion of their country.

⊃ European Parliament said, "This award is for those Ukrainians fighting on the ground, for those who have been forced to flee, for those who have lost relatives and friends, for all those who stand up and fight for who and what they believe in."

Other nominees:

⊃ Other nominees for 2022 award included Wikileaks founder Julian Assange who is still in jail and "Truth Commission", a body formed in Colombia, which began in 2018 and investigated atrocities committed during the country's five-decade conflict that ended in 2016.

About Sakharov Prize for Freedom of Thought:

⊃ The Sakharov Prize for Freedom of Thought is named after the Soviet dissent Andrei Sakharov.

⊃ Since 1988 has been awarded annually to individuals and organisations for defending human rights and freedom.

⊃ Notably, this prize was awarded to Kremlin critic Alexei Navalny in 2021.

⊃ Past laureates also include South African President Nelson Mandela, Pakistani education activist Malala Yousafzai and Belarus' democratic opposition.

THE 143-YEAR-OLD HISTORY OF THE MORBI BRIDGE IN GUJARAT COLLAPSED

Why in news?

⊃ Recently, the Morbi bridge (also known as Julto Pul) crowded with women and several children, snapped, plunging tourists into the water below.

⊃ Incidentally, the bridge had just reopened to the public on 26 October, Gujarati New Year Day, after nearly six months of renovation.

'Historic' hanging bridge:

⊃ The 230-metre long suspension bridge is situated on Machchhu river in Gujarat's Morbi city.

⊃ It is said that the bridge, built on same the lines of the Ram and Lakshman Jhulas on the Ganga in Uttarakhand, was constructed by Morbi's former ruler Sir Waghji Thakor 143 years ago.

⊃ He was inspired by colonial influence and decided to construct the bridge, as an "artistic and technological marvel" of that period, to connect Darbargadh Palace with Nazarbag Palace (the residences of the then royalty).

Inauguration:

⊃ The hanging bridge was first inaugurated on 20 February 1879, by then-Mumbai governor Richard Temple. All the material came from England and cost Rs 3.5 lakh at that time to construct the bridge.

⊃ The bridge had suffered severe damage in the 2001 earthquake.

⊃ The famous suspension bridge had shut down for six months for renovations.

MOU BETWEEN FIFA AND AIFF FOR IMPLEMENTING FOOTBALL4SCHOOLS INITIATIVE IN INDIA

Why in news?

⊃ Recently, the Ministry of Education signed an MoU with FIFA and All India Football Federation for the 'Football4Schools' initiative in India.

Collaboration:

⊃ FIFA, All India Football Federation and Ministry of Education, GoI through this MoU on the sidelines of U-17 WWC are collaborating together to promote football and also equip the young learners with valuable life skills.

Benefits of Football for Schools Programme:

⊃ Empower learners (boys and girls) with valuable life skills and competencies.

⊃ Empower and provide coach-educators with the training to deliver sport and life-skills activities.

⊃ Build the capacity of stakeholders (Schools, Member Associations and public authorities) to deliver training in life skills through football.

⊃ Strengthen the cooperation between governments and participating schools to enable partnerships, alliances and intersectoral collaboration.

Way Forward:

⊃ The football is an immensely popular sport and the Football4Schools program uses it as a positive tool to inspire children and ensure their holistic development.

⊃ 'Football4Schools' aims to empower 25 million young boys and girls in India through sports-integrated learning.

PRACTICE QUESTION FOR UPSC PRELIMS EXAM

1. According to a UNICEF report, the prevalence of child marriage is decreasing globally. Consider the following statement regarding the condition in Africa:
   1. Lower levels of child marriage are found in Eastern and Southern Africa.
   2. In the regions of Ethiopia, child marriage has on average more than doubled in a year as of June 2022.
   3. Incidences of child marriage was the highest in Southern and northern Africa.

   Choose the correct option from the codes given below:
   a) 1 and 1   b) 2 and 3
   c) 1 and 3   d) 1, 2 and 3

2. Consider the following statement regarding the 18th Persistent Organic Pollutants (POP) Review Committee (POPRC-18):
   1. It has included three more chemical in its agenda.
   2. The listed chemicals include a pesticide, a flame retardant and some plastic stabilising substances.
   3. POPRC-18 aims to list each of these chemicals in Annex A (elimination), B (restriction) and/ or C (unintended release) of the Stockholm Convention.

   Choose the correct option from the codes given below:
   a) 1 and 1   b) 2 and 3
   c) 1 and 3   d) 1, 2 and 3

3. Consider the following statement:
   1. United Nations marks October 1as International Day for Older Persons.
   2. By 2050, those older than 65 years will be twice as many as children under five.

   Choose the correct option from the codes given below:
   a) 1 Only   b) 2 Only
   c) 1 and 2   d) None of the above

4. Consider the following statement:
   1. Russia formally annexed five Ukrainian regions to Russia.
   2. Russia is now in control of 25 per cent of Ukraine's territory.

   Choose the correct option from the codes given below:

   a) 1 Only   b) 2 Only
   c) 1 and 2   d) None of the above

5. Consider the following statement regarding President's Bodyguard:
   1. It is the senior-most Regiment of Indian Army.
   2. The President's Bodyguard, raised by Governor-General Lord Wellesley

   Choose the correct option from the codes given below:
   a) 1 Only   b) 2 Only
   c) 1 and 2   d) None of the above

6. Recently China tried to get a resolution passed against the AUKUS pact. Consider the following statement:
   1. AUKUS is a trilateral security pact between Australia, the United Kingdom and the United States.
   2. Australia is now set to join an elite group that operate nuclear-powered submarines.
   3. Australia had a civilian nuclear power industry.

   Choose the correct option from the codes given below:
   a) 1 and 2   b) 2 and 3
   c) 1 and 3   d) 1, 2 and 3

7. India celebrated the first anniversary of SBM-Urban 2.0 recently. Consider the following statement:
   1. Indore bagged the first place for cleanest city in the population less than one lakh category.
   2. Patan from Chhattisgarh bagged the second position in the population less than one lakh category.
   3. Tirupati received the best city award in Safai Mitra Suraksha.

   Choose the correct option from the codes given below:
   a) 1 and 2   b) 2 and 3
   c) 1 and 3   d) 1, 2 and 3

8. Consider the following statement:
   1. Haridwar was ranket the cleanest Ganga town in the category of more than 1 lakh population.
   2. Bijnor was ranked the first among Ganga towns with less than one lakh population.

   Choose the correct option from the codes given below:
   a) 1 Only   b) 2 Only
   c) 1 and 2   d) None of the above

9. Recently, the Prime Minister of India launched 5G services. Consider the following statement:
   1. It is the latest upgrade in the long-term evolution (LTE) mobile broadband networks.
   2. It is a global wireless network expected to deliver ultra-low latency.
   3. Latency is the amount of time data takes to travel between its source and destination.

   Choose the correct option from the codes given below:
   a) 1 and 2   b) 2 and 3
   c) 1 and 3   d) 1, 2 and 3

10. Which among the following states is not among the main stem Ganga basin states?
    a) Odisha   b) Bihar
    c) Jharkhand   d) West Bengal

11. Consider the following statement regarding QR codes:
    1. It is a graphical representation of digital data.
    2. The data in it is a series of dots in a square grid.
    3. The American Company invented the first QR Code system in 1994.

    Choose the correct option from the codes given below:
    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

12. Consider the following statement regarding YUVA 2.0:
    1. The implementing agency of this scheme in Ministry of Skill Development and Entrepreneurship.
    2. It is an Author Mentorship programme.
    3. National Book Trust will publish the books prepared under this scheme.

    Choose the correct option from the codes given below:
    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

13. Consider the following statement regarding the objectives of India's Mangalyaan mission:
    1. To study Martian atmosphere.
    2. It aims to explore Martian surface features, mineralogy, morphology using indigenous scientific instruments.

    Choose the correct option from the codes given below:
    a) 1 Only   b) 2 Only
    c) 1 and 2   d) None of the above

14. Recently, a team of researchers identified a strong correlation between the accelerated rate of melting ice and the rate of ocean acidification. Consider the following statement:
    1. According to researchers, Arctic Sea will no longer survive after 2050.
    2. Seawater is normally alkaline.

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3. Water under the sea ice had a deficit of carbon dioxide.

Choose the correct option from the codes given below:
a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

15. Nord Stream Gas pipeline runs under which among the following Sea?
    a) Baltic Sea   b) Black Sea
    c) Caspian Sea   d) Adriatic Sea

16. Consider the following statement regarding Ujjwala 2.0:
    1. It aims to empower women and protecting their health.
    2. Objective is to reduce the number of deaths in India due to unclean cooking fuel.
    3. Migrant workers are not eligible for this scheme.

    Choose the correct option from the codes given below:
    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

17. Consider the following statement regarding Ramanujan Prize:
    1. The prize is related with the contribution in the field of Physic.
    2. For 2022, the award is presented to Yunqing Tang.
    3. Her works display a remarkable combination of sophisticated techniques, in which the arithmetic and geometry of modular curves and of Shimura varieties play a central role.

    Choose the correct option from the codes given below:
    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

18. Consider the following statement:
    1. Svante Paabo was awarded the 2022 Nobel Prize in Medicine
    2. His research proved that modern humans share DNA with extinct relatives Neanderthals and Denisovans.

    Choose the correct option from the codes given below:
    a) 1 Only   b) 2 Only
    c) 1 and 2   d) None of the above

19. Consider the following statement regarding Light Combat Helicopter (LCH):
    1. It was inducted into the IAF's newly raised 143 Helicopter Unit.
    2. It is an attack helicopter that can be deployed in various roles.
    3. The name given to the new chopper is Prachanda.

    Choose the correct option from the codes given below:
    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

20. Consider the following statement:
    1. Jharkhand, Rajasthan, Delhi, Gujarat and Goa have more than 50% of land area undergoing desertification.
    2. According to the Desertification and Land Degradation Atlas, at least 30% of India's total geographical area is under the category of "degraded land".
    3. Desertification and Land Degradation Atlas published by NITI Aayog.
    Choose the correct option from the codes given below:
    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

21. Consider the following statement regarding the Nobel Prize for Physic in 2022:
    1. John Clauser built an apparatus that emitted two entangled photons at a time.
    2. Anton Zeilinger group has demonstrated a phenomenon called quantum teleportation.
    3. Giorgio Parisi discovered hidden patterns in disordered complex materials.
    Choose the correct option from the codes given below:
    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

22. Consider the following statement:
    1. Shaliganga Nallah is a feeding channel for the Chitrangudi Bird Sanctuary.
    2. Hokersar Wetland Reserve is an internationally declared Ramsar site and home to migratory birds.
    3. Kuhls are traditional, community-managed irrigation systems in Kashmir and Himachal Pradesh.
    Choose the correct option from the codes given below:
    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

23. Several countries across the world are in the grips of a cholera outbreak. Consider the following statement regarding Cholera:
    1. The disease in India is endemic.
    2. It is caused by infection of the intestine with the bacterium Vibrio cholera.
    Choose the correct option from the codes given below:
    a) 1 Only   b) 2 Only
    c) 1 and 2   d) None of the above

24. RPF started Pan India drive under the code name "SAMSAR", which incorporated various operation. Which among the following operation is not included in it?
    a) Operation "Nanhe Fariste"
    b) Mission "Jeewan Raksha"
    c) Operation "Matrishakti"
    d) Operation Meghdoot

25. Consider the following statement:
    1. Alain Aspect, John Clauser, and Anton Zeilinger were awarded 2022 Nobel Prize in Physics.
    2. They establishing the violation of Bell inequalities and pioneered quantum information science.
    3. Anton Zeilinger is the youngest person to win the Physics award has been Lawrence Bragg.
    Choose the correct option from the codes given below:
    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

26. Consider the following statement regarding 2022 Nobel Prize in Chemistry:
    1. Carolyn Bertozzi, Morten Meldal, and Barry Sharpless were nominated for this award.
    2. They were awarded for the development of click chemistry and bioorthogonal chemistry.
    3. Morten Meldal is only the fifth person to be awarded two Nobel Prizes.
    Choose the correct option from the codes given below:
    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

27. Indian Navy Frigate INS Tarkash completed her 41-day long anti-piracy deployment in the Gulf of Guinea is situated in:
    a) Pacific Ocean   b) Atlantic Ocean
    c) Mediterranean Sea   d) Gulf of Mexico

28. Consider the following statement:
    1. India has emerged as a largest producer of sugar.
    2. India is the second largest exporter of sugar.
    Choose the correct option from the codes given below:
    a) 1 Only   b) 2 Only
    c) 1 and 2   d) None of the above

29. Consider the following statement:
    1. Barry Sharpless coined the concept of click chemistry.
    2. Azide is an organic compound.
    3. Azide is utilised in the development of drugs, for mapping DNA and creating materials.
    Choose the correct option from the codes given below:
    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

30. Consider the following statement regarding Constitution (Scheduled Castes) Order of 1950:
    1. The order provided for recognising only Hindus as SCs.
    2. Later amendment include Dalit who had converted to Sikhism or Buddhism.
    3. Amendment were aided by the reports of Khosla Commission.
    Choose the correct option from the codes given below:
    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

31. Recently, the World Health Organization (WHO) issued an alert over four cough and cold syrups, which had unacceptable amounts of diethylene glycol and ethylene glycol as contaminants. Consider the following statement:
    1. Diethylene Glycol (DEG) or ethylene glycol when consumed can prove fatal.
    2. The chemical is used in antifreeze, brake fluids, cosmetics, and lubricants.
    3. It can cause brain hemorrhage and heart attack.
    Choose the correct option from the codes given below:
    a) 1 and 2 　　　　　　 b) 2 and 3
    c) 1 and 3 　　　　　　 d) 1, 2 and 3

32. Consider the following statement regarding International Union of Geological Sciences:
    1. The IUGS Secretariat is headquartered in Tokyo.
    2. The Petrified Forest of Lesvos and Volcanic Caldera have made it to the list.
    3. The Petrified Forest is a rare fossil forest ecosystem from Greece.
    Choose the correct option from the codes given below:
    a) 1 and 2 　　　　　　 b) 2 and 3
    c) 1 and 3 　　　　　　 d) 1, 2 and 3

33. Consider the following statement:
    1. Meghalaya's Mawmluh Cave is UNESCO International Union of Geological Sciences (IUGS) Geological Sites' list.
    2. Mawmluh Cave is fourth longest in the Indian subcontinent.
    Choose the correct option from the codes given below:
    a) 1 Only 　　　　　　 b) 2 Only
    c) 1 and 2 　　　　　　 d) None of the above

34. Who among the following is awarded Nobel Prize in Literature for 2022?
    a) Louise Gluck 　　　　 b) Abdulrazak Gurnah
    c) Olga Tokarczuk 　　　 d) Annie Ernaux

35. Consider the following statement regarding the process followed by Insolvency and Bankruptcy Code (IBC):
    1. Corporate Debtor (CD) or a Company if failed to pay loan can apply for the initiation of a Corporate Insolvency Resolution Process (CIRP).
    2. Presently the minimum amount of default which the creditor or debtor could apply for insolvency is ₹1 lakh.
    Choose the correct option from the codes given below:
    a) 1 Only 　　　　　　 b) 2 Only
    c) 1 and 2 　　　　　　 d) None of the above

36. The United Nations Strategic Plan for Forests 2017–2030, explicitly recognises the role of forests in maintaining biodiversity. Consider the following statement:

    1. Forests cover 31 per cent of the world's land surface.
    2. The world's forests provide habitats for about 80 per cent of amphibian species.
    3. 60 per cent of all vascular plants occur in Deciduous forests.
    Choose the correct option from the codes given below:
    a) 1 and 2 　　　　　　 b) 2 and 3
    c) 1 and 3 　　　　　　 d) 1, 2 and 3

37. Recently, the Ministry of Environment, Forest and Climate Change has constituted a Task Force for monitoring Cheetah. Consider the following statement:
    1. National Cheetah Conservation Authority (NCCA) had been constituted to look after Cheetah.
    2. The Task force will be in force for 2 years.
    3. Eight cheetahs were brought to India from Namibia were released in Kuno National Park.
    Choose the correct option from the codes given below:
    a) 1 and 2 　　　　　　 b) 2 and 3
    c) 1 and 3 　　　　　　 d) 1, 2 and 3

38. Consider the following statement regarding Supercontinent:
    1. It is formed because of the convergence of several other existing continents.
    2. A scientist called Alfred Wegner first proposed the concept.
    Choose the correct option from the codes given below:
    a) 1 Only 　　　　　　 b) 2 Only
    c) 1 and 2 　　　　　　 d) None of the above

39. The X-ray spectrometer 'CLASS' on the Chandrayaan-2 Orbiter has mapped which among the following mineral in the moon?
    a) Monazite 　　　　　 b) Phosphorus
    c) Sulfur 　　　　　　 d) Sodium

40. Consider the following statement regarding Central Bank Digital Currency:
    1. It is a legal tender issued in a digital form by a central bank.
    2. It is a "fungible legal tender".
    3. RBI's digital currency cannot be easily converted against commercial bank money and cash.
    Choose the correct option from the codes given below:
    a) 1 and 2 　　　　　　 b) 2 and 3
    c) 1 and 3 　　　　　　 d) 1, 2 and 3

41. Consider the following statement regarding SIPRI report on Indo-Pacific in self-reliant defence production:
    1. According to the report, India stands at fourth position.
    2. China topped the list.
    3. SIPRI is an international institute function under United Nation.

Choose the correct option from the codes given below:
a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

42. Consider the following statement:
1. Duvalius Dokovici is a recently discovered frog species.
2. Duvalius Dokovici belongs to the Duvalius genus.
3. Serbian scientists have named the species after tennis great Novak Djokovic.

Choose the correct option from the codes given below:
a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

43. Consider the following statement regarding Svante Pääbo research:
1. DNA is concentrated in two different compartments within the cell.
2. Nuclear DNA stores most of the genetic information.

Choose the correct option from the codes given below:
a) 1 Only   b) 2 Only
c) 1 and 2   d) None of the above

44. Consider the following statement:
1. OPEC is a group of Organization of the Petroleum Exporting Countries.
2. The objective of the organization is to coordinate and unify the petroleum policies of its member Countries and ensure the stabilisation of oil markets.
3. Russia is one of the allied country of OPEC+.

Choose the correct option from the codes given below:
a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

45. Consider the following statement regarding Click Chemistry:
1. It has to occur in the presence of oxygen and in water.
2. Azide-alkyne cycloaddition has become almost synonymous with click chemistry.
3. Azides and alkynes are of same chemical groups.

Choose the correct option from the codes given below:
a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

46. Consider the following statement regarding Modhera:
1. It is India's first solar powered village.
2. It is associated with the Sun Temple.
3. It is situated on the bank of Rupen River.

Choose the correct option from the codes given below:
a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

47. Consider the following statement:
1. Zen Technology Limited develops 'Droni' drone.
2. The drone provides solutions for agricultural pesticide spraying, solar panel cleaning and delivery services.

Choose the correct option from the codes given below:
a) 1 Only   b) 2 Only
c) 1 and 2   d) None of the above

48. Consider the following statement regarding Adventure Tourism Competitive Index:
1. India's position was 96 in 2020.
2. India rank lower than its neighbor Bhutan and Nepal.

Choose the correct option from the codes given below:
a) 1 Only   b) 2 Only
c) 1 and 2   d) None of the above

49. Consider the following statement regarding Online Gaming in India and choose the incorrect option:
a) The revenue of the Indian mobile gaming industry is expected to exceed $1.5 billion in 2022.
b) State governments also do not have enough blocking powers like the Centre.
c) The online gaming leading to suicides in various parts of the country.
d) Online gaming is a Union subject.

50. India will assume the presidency of which among the following international institution in 2023?
a) G20
b) Shanghai Cooperation Organisation (SCO)
c) UN Security Council
d) All the above

51. Consider the following statement regarding National Tele Mental Health Programme (NTMHP):
1. It was announced in Union Budget 2022-23.
2. IIT Bengaluru and National Health Systems Resource Centre (NHRSC) will provide the technical support.
3. The Union Government aims to open at least one Tele-MANAS Cell in Delhi, Mumbai, Chennai and Kolkata.

Choose the correct option from the codes given below:
a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

52. Consider the following statement regarding 1930's Great Depression:
1. Douglas Diamond had argued that monetary policy was ineffective in such crises.
2. Milton Friedman argued that central banks could create money even when interest rates were zero.
3. Ben Bernanke argued that lack of policy stimulus prolonged this crisis.

Choose the correct option from the codes given below:

a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

53. Consider the following statement regarding SedaDNA:
   1. It is a new technique to study long-term responses of ocean ecosystems to climate change.
   2. The study can also help assess current and future changes in marine life around Antarctica.
   Choose the correct option from the codes given below:
   a) 1 Only   b) 2 Only
   c) 1 and 2   d) None of the above

54. The Nobel Prize in economics for 2022 has been awarded to
   a) Ben Bernanke   b) Douglas Diamond
   c) Philip Dybvig   d) All the above

55. Consider the following statement regarding "Talaq-e-Kinaya and Talaq-e- Bain":
   1. They were declared void and unconstitutional by Supreme Court.
   2. It is an instantaneous and irrevocable and extra-judicial form of talaq, in a single sitting.
   3. These does not violet article 21 and 25.
   Choose the correct option from the codes given below:
   a) 1 and 2   b) 2 and 3
   c) 1 and 3   d) 1, 2 and 3

56. Consider the following statement regarding Flexi-Fuel Strong Hybrid Electric Vehicles (FFVSHEV):
   1. It has a has a flex-fuel engine.
   2. Flex-fuel vehicles are available in Brazil, the USA and Canada.
   3. Flex-fuel compatible cars can run on only one type of fuel.
   Choose the correct option from the codes given below:
   a) 1 and 2   b) 2 and 3
   c) 1 and 3   d) 1, 2 and 3

57. Consider the following statement regarding Commitment to Reducing Inequality Index (CRII):
   1. IMF releases this index.
   2. The three areas for preparing this index are public services, taxation and workers' rights.
   3. Norway leads the CRII followed by Germany and Australia.
   Choose the correct option from the codes given below:
   a) 1 and 2   b) 2 and 3
   c) 1 and 3   d) 1, 2 and 3

58. Consider the following statement:
   1. China had successfully launched Kuafu-1 satellite.
   2. The satellite had two major eruptive phenomenon, solar flares and coronal mass ejections.
   Choose the correct option from the codes given below:

a) 1 Only   b) 2 Only
c) 1 and 2   d) None of the above

59. Sila Sibiri pipeline will connect
   a) Kazan to Beijing   b) Omsk to Guangzhou
   c) Sochi to Shenzhen   d) Siberia to Shanghai

60. Consider the following observation in Commitment to Reducing Inequality Index (CRII):
   1. India has moved to sixth position.
   2. Under ranking for minimum wage, India has fallen 73 places.
   3. Report shows India making major decline when it comes to reducing inequality during the COVID-19 pandemic.
   Choose the correct option from the codes given below:
   a) 1 and 2   b) 2 and 3
   c) 1 and 3   d) 1, 2 and 3

61. Consider the following statement regarding Slender Loris:
   1. They are small nocturnal mammal that spends most of its life on trees.
   2. The species has a wide range of ecological roles.
   3. India's first ever Wildlife Sanctuary for Slender Loris is located in Kerala.
   Choose the correct option from the codes given below:
   a) 1 and 2   b) 2 and 3
   c) 1 and 3   d) 1, 2 and 3

62. Consider the following:
   1. Balpakram Tiger Reserve: Agasthyamalai
   2. Kazhuveli bird sanctuary: Villupuram
   3. Nanjarayan Tank bird sanctuary: Tiruppur
   Which among the following Reserve is located in Tamil Nadu?
   a) 1 and 2   b) 2 and 3
   c) 1 and 3   d) 1, 2 and 3

63. Consider the following statement regarding Michael Kremer:
   1. He is the winner of 2019 Nobel Prize in economics.
   2. He was awarded for his experimental approach to alleviating global poverty.
   Choose the correct option from the codes given below:
   a) 1 Only   b) 2 Only
   c) 1 and 2   d) None of the above

64. Recently, the Union Cabinet has approved a new Scheme, Prime Minister's Development Initiative for North East Region (PM-DevINE). Consider the following statement regarding its objectives:
   1. Fund infrastructure convergently, in the spirit of PM Gati Shakti.
   2. Support social development projects based on felt needs of the NER.
   3. Enable livelihood activities for youth and women.
   Choose the correct option from the codes given below:

a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

65. Consider the following statement regarding Sloth Bear:
    1. World first Sloth Bear Day was observed on 12th October.
    2. It aims to generate awareness and strengthen conservation efforts around the unique bear species.
    3. It is classified as endangered species by IUCN.
    Choose the correct option from the codes given below:
    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

66. Consider the following statement regarding recently launched Living Planet Report:
    1. According to the report there has been a 69 per cent decline in the wildlife populations.
    2. The report is released by IUCN.
    Choose the correct option from the codes given below:
    a) 1 Only   b) 2 Only
    c) 1 and 2   d) None of the above

67. Consider the following statement:
    1. The forex market is regulated by the SEBI.
    2. RBI does not permit a bank to purchase dollars from the RBI.
    3. Selling these dollars in the overseas cross currency market is also prohibited by the central bank.
    Choose the correct option from the codes given below:
    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

68. Consider the following statement regarding exercise "Prasthan":
    1. It was conducted in the Krishna Godavari Basin Offshore Development Area (ODA).
    2. It aims to integrate the efforts of all maritime stakeholders involved in offshore defence.
    Choose the correct option from the codes given below:
    a) 1 Only   b) 2 Only
    c) 1 and 2   d) None of the above

69. Consider the following statement regarding RoboCap:
    1. Massachusetts Institute of Technology (MIT) develops it.
    2. It could be used to orally administer large protein drugs such as insulin.
    3. It has a robotic cap that tunnels through the mucus barrier after reaching the small intestine.
    Choose the correct option from the codes given below:
    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

70. Consider the following statement regarding recently launched Living Planet Report:
    1. Africa recorded a 66 per cent fall in its wildlife populations
    2. Freshwater species populations globally reduced by 83 per cent.
    3. The highest decline (94 per cent) was in the North America.
    Choose the correct option from the codes given below:
    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

71. Consider the following statement regarding Dengue:
    1. It is a vector-borne disease.
    2. It is found in tropical and sub-tropical climates.
    3. Only a female mosquito, Aedes Aegypti, transmits it.
    Choose the correct option from the codes given below:
    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

72. Recently, the INS Arihant carried out a successful test of a submarine-launched ballistic missile (SLBM) in the Bay of Bengal. Consider the following statement:
    1. INS Arihant is a Russian leased nuclear submarine.
    2. India is among just six countries in the world to have the capability to fire a nuclear missile from land, air and undersea.
    3. The INS Arihant is designed to carry K-5 or K-4 missiles.
    Choose the correct option from the codes given below:
    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

73. Consider the following statement:
    1. Barium is two and half times heavier than iron.
    2. Barium salts are used in fireworks to generate green lights.
    Choose the correct option from the codes given below:
    a) 1 Only   b) 2 Only
    c) 1 and 2   d) None of the above

74. Consider the following statement regarding the Global Hunger Index 2022:
    1. India is ahead of its neighbouring countries.
    2. India is the worst performing South Asian country in this index.
    Choose the correct option from the codes given below:
    a) 1 Only   b) 2 Only
    c) 1 and 2   d) None of the above

75. Which among the following is not one among the following indicator used to measure Global Hunger Index?

a) Female infanticides   b) Undernourishment

c) Child Stunting   d) Child Mortality

76. Consider the following statement regarding Indian Gaur:

    1. It is the largest wild Bovine.
    2. It is listed in Wildlife Protection Act, 1972.
    3. It is listed as critically endangered species by IUCN.

    Choose the correct option from the codes given below:

    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

77. Consider the following statement regarding "Judge Case":

    1. In the 'First Judges Case', the court held that the consultation with the CJI is not mandatory.
    2. The Second Judges case introduced the collegium system in 1993.
    3. The 'Third Judges Case', expanded the collegium to its present composition of the CJI and four of his senior-most judges.

    Choose the correct option from the codes given below:

    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

78. Consider the following statement:

    1. Hyderabad has won the World Green City Award 2022.
    2. World Green City Awards 2022 was held in South Korea.

    Choose the correct option from the codes given below:

    a) 1 Only   b) 2 Only
    c) 1 and 2   d) None of the above

79. Recently, an expert team has identified different varieties of the neelakurinji on the Kallippara hills. Which among the following belong to such varities?

    a) Strobilanthes anamallaica
    b) Strobilanthes heyneanus
    c) Strobilanthes neoasper
    d) All the above

80. Consider the following:

    1. Living Green for Climate Change: Mexico
    2. Living Green for Health and Wellbeing: Brazil
    3. Living Green for Water: France

    Which among the following is the correct match to win International Association of Horticulture Producers (AIPH) award 2022?

    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

81. Consider the following statement regarding Digital Banking Units:

    1. Finance Minister announced setting up the 75 DBUs in 75 districts in the annual budget of 2022-23.
    2. It is being set up with the objective to ensure the benefits of digital banking.

    3. The products and services will be offered to customers in digital mode only.

    Choose the correct option from the codes given below:

    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

82. Consider the following statement:

    1. Prime Minister of India started a nationwide campaign called 'Child Marriage Free India'.
    2. The 2011 census reported over 12 million child marriages in the country.
    3. According to NFHS 23.3 percent of women between the ages of 20 to 24 are married before turning 18.

    Choose the correct option from the codes given below:

    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

83. Consider the following statement:

    1. Ministry of Women and Child Development rejected the Global Hunger Index (GHI) 2022.
    2. India was placed behind Nepal and Bangladesh.

    Choose the correct option from the codes given below:

    a) 1 Only   b) 2 Only
    c) 1 and 2   d) None of the above

84. Which among the following states in India became the first States to start MBBS course in the Hindi language?

    a) Uttar Pradesh   b) Chhattisgarh
    c) Uttarakhand   d) Madhya Pradesh

85. Consider the following statement regarding Global Hunger Index Report 2022:

    1. It is jointly-produced by the Germany-based not-for-profit organisation Welthungerhilfe and Ireland-based Concern Worldwide.
    2. The inaugural report was first published in 2006.
    3. It is computed using three indicators.

    Choose the correct option from the codes given below:

    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

86. Consider the following statement regarding BF.7:

    1. It is one of the variants responsible for the spike in cases in China.
    2. The Omicron variant emerged in India.

    Choose the correct option from the codes given below:

    a) 1 Only   b) 2 Only
    c) 1 and 2   d) None of the above

87. Consider the following statement regarding Booker Prize:

    1. Margaret Atwood won the Booker prize 2022 for fiction.
    2. It was originally open to British, Irish and Commonwealth writers.
    3. The award was founded in 1969.

Choose the correct option from the codes given below:
a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

88. Consider the following statement regarding official language:
   1. In the Constituent Assembly, Hindi was voted as the official language by a single vote.
   2. English would continue to be used as an associate official language for 15 years.
   Choose the correct option from the codes given below:
   a) 1 Only   b) 2 Only
   c) 1 and 2   d) None of the above

89. NASA is planning to launch the next resupply mission to the International Space Station (ISS). Consider the following statement:
   1. NASA will launch its Bio-Fabrication Facility.
   2. NASA will also conduct a study on growing plants in space.
   3. Scientists will also shed light on climate change and global warming.
   Choose the correct option from the codes given below:
   a) 1 and 2   b) 2 and 3
   c) 1 and 3   d) 1, 2 and 3

90. Consider the following statement regarding PM Kisan Samruddhi Kendras (PM-KSK):
   1. It will act as a one-stop-shop for farmers.
   2. It will provide information regarding various government schemes.
   Choose the correct option from the codes given below:
   a) 1 Only   b) 2 Only
   c) 1 and 2   d) None of the above

91. Consider the following statement regarding International Solar Alliance:
   1. It is a joint initiative of India and France against climate change through the deployment of solar energy solutions.
   2. ISA is a coalition of solar resource rich countries lying fully or partially between the Tropic of Cancer and the Tropic of Capricorn.
   3. The Cancan Declaration establishes ISA as an alliance dedicated to the promotion of solar energy.
   Choose the correct option from the codes given below:
   a) 1 and 2   b) 2 and 3
   c) 1 and 3   d) 1, 2 and 3

92. Consider the following statement regarding Indus Water Treaty:
   1. IMF played the role of signatory to sign the treaty between India and Pakistan.
   2. According to this treaty, all the waters of the eastern rivers is allocated to India.
   3. The waters of western rivers have been assigned largely to Pakistan.
   Choose the correct option from the codes given below:
   a) 1 and 2   b) 2 and 3
   c) 1 and 3   d) 1, 2 and 3

93. Consider the following statement regarding Pinaka Rocket:
   1. India will export this indigenously manufactured rocket launcher to Armenia.
   2. It is named from the legendary bow of Shiva
   Choose the correct option from the codes given below:
   a) 1 Only   b) 2 Only
   c) 1 and 2   d) None of the above

94. Consider the following statement regarding Jumping Spider:
   1. This new species had been found from Thar Desert of Rajasthan.
   2. This spider stays among dry leaf blades.
   3. This spider lives in the moist deciduous forest.
   Choose the correct option from the codes given below:
   a) 1 and 2   b) 2 and 3
   c) 1 and 3   d) 1, 2 and 3

95. Consider the following statement:
   1. Large mammalian herbivores like the Yak and Ibex play a crucial role in stabilising the pool of soil carbon.
   2. Depending on the soil conditions, nitrogen can either stabilise or destabilise the carbon pool.
   3. Soil contains less carbon than all plants and the atmosphere combined.
   Choose the correct option from the codes given below:
   a) 1 and 2   b) 2 and 3
   c) 1 and 3   d) 1, 2 and 3

96. Consider the following statement regarding Reserve Bank Innovation Hub (RBIH):
   1. The organisation serves as a focal point to position India as a global innovation hub.
   2. It aims to promote and facilitate an environment that accelerates innovation across the financial sector.
   3. It is not a subsidiary of the Reserve Bank of India (RBI).
   Choose the correct option from the codes given below:
   a) 1 and 2   b) 2 and 3
   c) 1 and 3   d) 1, 2 and 3

97. Consider the following statement regarding the ancient Harappan city, Lothal:
   1. It was the only port city of Harappan civilisation.
   2. It is one of the southernmost sites of the Indus Valley Civilisation.
   3. The word 'Lothal' is a combination of Loth and thal, meaning the mound of the dead in Gujarati.

Choose the correct option from the codes given below:

a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

98. Consider the following statement regarding HTT-40:
1. It will be used for basic flight training, aerobatics and instrument flying.
2. It boasts of unique features like running change-over of pilots, hot-refuelling and short-turnaround time.

Choose the correct option from the codes given below:

a) 1 Only   b) 2 Only
c) 1 and 2   d) None of the above

99. Consider the following statement regarding Sakharov Prize:
1. It is awarded annually to an individuals or an organisations for defending human rights and freedom.
2. For 2022, this prestigious award is awarded to Ukrainian people.
3. Nelson Mandela, Malala Yousafzai and Alexei Navalny were the winner of this award.

Choose the correct option from the codes given below:

a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

100. Consider the following statement regarding India Post Payments Bank (IPPB):
1. It has been established under Ministry of Communication.
2. The fundamental mandate of IPPB is to remove barriers for the unbanked and under-banked and reach the last mile.
3. Government of India own only 55 percent equity of IPPB.

Choose the correct option from the codes given below:

a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

101. Consider the following statement:
1. India's domestic gas price is determined from the average of four global indices.
2. Hydraulic fracturing enhance oil and gas extraction.
3. Groningen gas field is located in Siberia.

Choose the correct option from the codes given below:

a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

102. Consider the following statement:
1. Uttar Pradesh is the leading sugar producer in the country.
2. The sucrose levels in the sugarcane produced in Uttar Pradesh continue to increase.

Choose the correct option from the codes given below:

a) 1 Only   b) 2 Only
c) 1 and 2   d) None of the above

103. Consider the following statement regarding the challenges, which impact vultures in the State:
1. Spread of invasive weeds.
2. Terminalia Arjuna trees

Choose the correct option from the codes given below:

a) 1 Only   b) 2 Only
c) 1 and 2   d) None of the above

104. Which among the following production of drugs led to the crash in vulture populations across India/

a) Diclofenac   b) Nimesulide
c) Ketoprofen   d) All the above

105. Consider the following statement:
1. Mission LiFE is designed with the objective to protect and preserve the environment for the period 2022 to 2027.
2. The concept of LiFE was introduced COP25 at Madrid (Spain).

Choose the correct option from the codes given below:

a) 1 Only   b) 2 Only
c) 1 and 2   d) None of the above

106. Consider the following:
1. Jim Corbett National Park
2. Forest Survey of India (FSI)
3. White Tiger Safari

Which among the following is located in Uttarakhand?

a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

107. Consider the following statement regarding GM Mustard DMH-11:
1. Mustard is sown in summer and winter.
2. Mustard is largest edible oil yielding crop of India.
3. It is Herbicide Tolerant (HT) crop.

Choose the correct option from the codes given below:

a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

108. Consider the following statement regarding Human sacrifice and Witchcraft death in India:
1. According to NCRB report, maximum number of witchcraft cases were reported from Chhattisgarh.
2. In India, there is no central law that exclusively deals with crimes related to witchcraft.

Choose the correct option from the codes given below:

a) 1 Only   b) 2 Only
c) 1 and 2   d) None of the above

109. Consider the following statement regarding Hepatitis B virus (HBV):
1. It is spread primarily through sexual contact and sharing of contaminated needles.
2. It causes chronic hepatitis B infection.

3. It can lead to progressive liver disease.

Choose the correct option from the codes given below:
a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

110. Consider the following statement:
1. Israel considers "complete and united" Jerusalem as its capital.
2. Most countries still have their embassies in Tel Aviv and not Jerusalem.
3. Australia gave its recognition of West Jerusalem as the capital of Israel.

Choose the correct option from the codes given below:
a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

111. Consider the following statement:
1. Pakistan is taken off from FATF Grey list.
2. Democratic Republic of Congo, Mozambique and Tanzania were added to the "grey list" of FATF.
3. Nicaragua was added to the Black list of FATF.

Choose the correct option from the codes given below:
a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

112. Consider the following statement regarding Anti-Smog gun:
1. Treated sewage water could be used in the anti-smog gun.
2. It is also known as a spray or mist gun or water cannon.
3. It spray tiny droplets of water into the atmosphere to reduce air pollution by binding dust and other particulate matter.

Choose the correct option from the codes given below:
a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

113. Consider the following statement:
1. Terai Elephant Reserve (TER) would be the new Elephant reserve of Uttar Pradesh.
2. The new elephant reserve will include the area of Dudhwa Tiger Reserve and Pilibhit Tiger Reserve.

Choose the correct option from the codes given below:
a) 1 Only   b) 2 Only
c) 1 and 2   d) None of the above

114. Consider the following statement regarding Financial Action Task Force (FATF):
1. It is a global watchdog on Anti-Money Laundering and Combating Financing Terrorism efforts.
2. It is a 39-member body that was set up in 1989.
3. India became a full member of FATF in 2010.

Choose the correct option from the codes given below:
a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

115. Recently ISRO launched its heaviest rocket LVM3-M2/OneWeb India-1. Consider the following statement:
1. It was also New Space India Ltd's (NSIL) first launch with the vehicle.
2. It also became the first Indian rocket with a payload above 5500kg.
3. The launch is also first to place the satellites in the Low Earth Orbit.

Choose the correct option from the codes given below:
a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

116. Consider the following statement:
1. The Commission for Air Quality Management had developed a framework and action plan for the effective prevention and control of stubble burning.
2. In-situ management include incorporation of paddy straw and stubble in the soil using heavily subsidised machinery.
3. Waste-to-energy (WTE) plants and in packaging materials are also included in in-situ management

Choose the correct option from the codes given below:
a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

117. Consider the following statement regarding Canola:
1. It is not the only genetically modified mustard variety that has been cleared for commercial application.
2. GM canola has been cultivated across the world including Canada, the USA, and in Australia.
3. It is a temperate species of mustard.

Choose the correct option from the codes given below:
a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

118. Consider the following statement:
1. India is a major producer of 'Brassica juncea' variety of mustard.
2. Deepak Pental and a team of scientists at University of Delhi have developed the indigenous GM mustard variety.

Choose the correct option from the codes given below:
a) 1 Only   b) 2 Only
c) 1 and 2   d) None of the above

119. Consider the following statement regarding SAMRIDDHI Scheme:
1. It is an acronym for Strengthening and Augmentation of Municipal Revenue for Infrastructure Development in Delhi.
2. Under the scheme, residential property owners can pay just the principal property tax amount of the current and of the past five years.

3. For commercial properties, owners can pay the principal amount case of the last six years and get a waiver on past pending dues.

Choose the correct option from the codes given below:

a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

120. Consider the following statement regarding Competition Commission of India (CCI):

1. It is a quasi-judicial body.
2. It was formed by the recommendation of Raghavan committee.
3. It is a constitutional body.

Choose the correct option from the codes given below:

a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

121. Consider the following statement regarding the Blue Flag Certification:

1. Minicoy Thundi Beach and Kadmat Beach of Lakshadweep were added to this list.
2. India now has 12 beaches certified under the Blue Flag Certification.
3. Greece top the list of countries with Blue Flag awarded sites.

Choose the correct option from the codes given below:

a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

122. Consider the following:

1. NavIC: France
2. Galileo: Europe
3. GLONASS: Russia

Choose the correct match:

a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

123. Consider the following statement regarding Hybridisation:

1. It involves crossing two genetically dissimilar plant varieties that can even be from the same species.
2. The first-generation (F1) offspring tend to have higher yields than what either parent can individually give.

Choose the correct option from the codes given below:

a) 1 Only   b) 2 Only
c) 1 and 2   d) None of the above

124. Blue Beach award is accorded by

a) United Nations Environment Programme (UNEP)
b) United Nations World Tourism Organisation (UNWTO)
c) International Union for Conservation of Nature (IUCN)
d) All the above

125. Consider the following statement regarding Health ATM:

1. It is a touch-screen kiosk hardware, designed for managing health-related information.
2. It will bridge the gap of quality healthcare, especially in rural areas.
3. It will not conduct electrocardiogram (ECG).

Choose the correct option from the codes given below:

a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

126. Consider the following statement regarding Endogenous retroviruses:

1. It enter a host cell and introduce their RNA, which is converted to DNA.
2. It typically infect cells that do not pass from generation to generation.
3. It makes up about 15 per cent of the human genome.

Choose the correct option from the codes given below:

a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

127. Consider the following statement regarding C-295 transport aircraft:

1. This aircraft cannot operate from short or unprepared airstrips.
2. For the first time, the Airbus C-295 aircraft will be manufactured outside of Europe.
3. It is a new-generation tactical airlifter in the light and medium segment.

Choose the correct option from the codes given below:

a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

128. Consider the following statement:

1. Heat-related deaths increased by 68 per cent worldwide.
2. Food security was affected by climate change because higher temperatures threatened crop yields.

Choose the correct option from the codes given below:

a) 1 Only   b) 2 Only
c) 1 and 2   d) None of the above

129. Consider the following statement:

1. Emissions of India are about half of the G20 average.
2. India's contribution to cumulative CO_2 emissions is three per cent.
3. The EU and US are one of the largest producer of fossil CO_2 emission.

Choose the correct option from the codes given below:

a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

130. Consider the following statement regarding issue of child nutrition in India:
    1. According to WHO and UNICEF, breastfeeding should be initiated within the first hour of birth.
    2. Infants of Chhattisgarh, Jharkhand and Madhya Pradesh are not breastfeed within the first hour of birth.
    Choose the correct option from the codes given below:
    a) 1 Only   b) 2 Only
    c) 1 and 2   d) None of the above

131. Consider the following statement regarding occurrence of cyclone in Arabian Sea:
    1. There is an increase in cyclonic storms in Arabian Sea.
    2. There is an increase in cyclonic storm during post monsoon period.
    3. Bay of Bengal witness more cyclone than Arabian Sea.
    Choose the correct option from the codes given below:
    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

132. Consider the following statement regarding the Global TB Report 2022:
    1. The report is released by UNICEF.
    2. India's TB incidence for the year 2021 is 210 per 100,000 population.
    3. India is placed at the 36th position in terms of incidence rates.
    Choose the correct option from the codes given below:
    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

133. Consider the following statement:
    1. Gilgit-Baltistan is the northernmost tip of Kashmir.
    2. It provides a land route with China.
    Choose the correct option from the codes given below:
    a) 1 Only   b) 2 Only
    c) 1 and 2   d) None of the above

134. Consider the following statement regarding SIMBEX Exercise 2022:
    1. This exercise will be hosted by India at Visakhapatnam.
    2. This exercise was initially known as Exercise Lion King.
    3. It exemplifies the high level of cooperation between India and Singapore in the maritime domain.
    Choose the correct option from the codes given below:
    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

135. Consider the following statement regarding Thermal Inversion:
    1. Thermal inversion is when the temperature increases along with the higher altitude.
    2. Air parcels rising into this layer become cooler than the surrounding environment.
    3. This phenomenon only occur in summer.
    Choose the correct option from the codes given below:
    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

136. Recently, the Ministry of Electronics & IT notified the amendments to the IT intermediary Rules 2021. Consider the following statement:
    1. The amendments impose a legal obligation on intermediaries to take reasonable efforts to prevent users from uploading unlawful content.
    2. The amendment requires intermediaries to respect the rights guaranteed to users under the Constitution.
    3. No regional Indian language is used for effective communication.
    Choose the correct option from the codes given below:
    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

137. Consider the following statement regarding the Concept of Pleasure Doctrine:
    1. It is a concept derived from American Common Law.
    2. Article 310 of the Constitution says every person in the defence or civil service of the Union holds office during the pleasure of the President.
    3. Article 311 imposes restrictions on the removal of a civil servant.
    Choose the correct option from the codes given below:
    a) 1 and 2   b) 2 and 3
    c) 1 and 3   d) 1, 2 and 3

138. Consider the following statement:
    1. The United Nations Security Council Counter-Terrorism Committee unanimously adopted the Delhi Declaration.
    2. It aims to counter the use of new and emerging technologies for terrorist purposes.
    Choose the correct option from the codes given below:
    a) 1 Only   b) 2 Only
    c) 1 and 2   d) None of the above

139. Consider the following statement regarding the objectives of India-Mozambique-Tanzania Trilateral Exercise (IMT TRILAT):
    1. Capability development to address common threats.
    2. Enhancing interoperability
    3. Strengthening maritime cooperation

Choose the correct option from the codes given below:

a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

140. Consider the following statement:
     1. Salmonella serovars increased the difficulties in curing Salmonella-induced food-borne illnesses.
     2. Salmonella typhimurium causes bloodstream infection in the malnourished and immunocompromised population of sub-Saharan Africa.

     Choose the correct option from the codes given below:

     a) 1 Only   b) 2 Only
     c) 1 and 2   d) None of the above

141. Consider the following statement regarding Morbi Bridge:
     1. It is situated in Machchhu river in Gujarat.
     2. It was constructed by Morbi's former ruler Sir Waghji Thakor.
     3. The hanging bridge was first inaugurated William Bentinck.

     Choose the correct option from the codes given below:

     a) 1 and 2   b) 2 and 3
     c) 1 and 3   d) 1, 2 and 3

142. Consider the following statement regarding health impact of glyphosate:
     1. Government had ban the use of this product in any form.
     2. Health impacts of glyphosate range from cancer, reproductive and developmental toxicity to neurotoxicity.
     3. Burning of the skin, oral and nasal discomfort are some of it symptoms.

Choose the correct option from the codes given below:

a) 1 and 2   b) 2 and 3
c) 1 and 3   d) 1, 2 and 3

143. Consider the following statement:
     1. Next-Generation Launch Vehicle planned to carry a 10 tonne payload in the Geostationary Transfer Orbit (GTO).
     2. India's share in the launch services is projected to grow at a compound annual growth rate of 13 per cent by 2025.

     Choose the correct option from the codes given below:

     a) 1 Only   b) 2 Only
     c) 1 and 2   d) None of the above

144. Consider the following statement regarding the power of Governor:
     1. Article 163(1) says that the Council of Ministers must aid and advise the Governor
     2. The function of the appointed Governor is always subject to the policies of the elected government.
     3. Governor is generally bound by the Cabinet decision except when he has a legitimate right to invoke his discretion.

     Choose the correct option from the codes given below:

     a) 1 and 2   b) 2 and 3
     c) 1 and 3   d) 1, 2 and 3

145. Post of Governor was created by which among the following Act?
     a) Government of India Act, 1858
     b) Government of India Act, 1909
     c) Government of India Act, 1919
     d) Government of India Act, 1935

PRACTICE QUESTION FOR UPSC MAINS EXAM

1. What is the OneWeb satellite constellation? Discuss how the partnership between OneWeb and NewSpace India Limited will pave the way for a greater participation of private space players, resulting a boost to the Indian space economy?

2. How the recent Supreme Court verdict has significantly expanded scope of abortion rights in India? Discuss how India's abortion laws are moving in a progressive manner?

3. 'It is always advisable to surrender a child rather than abandon him if the conditions to retain the child are beyond the control of parents or guardian'. What is the legal framework avaible under Juvenile Justice (Care and Protection of Children) Act, 2015 to reduce rising cases of child abandonment in India? Also discuss the challenges and a suitable way forward.

4. The decision of Live-streaming of Indian Supreme Court will go down in the annals of Indian legal and constitutional history as one of the most important and influential decisions. Comment.

5. 'The Australia-India-Indonesia trilateral can prove to be a really effective one in the Indian Ocean Region and the wider Indo-Pacific'. Elaborate

6. Give a brief note on provisions under Indian Constitution regulating the Governor's assent to Bills. Discuss whether the government of a State can challenge the refusal of assent by the Governor in a court of law or not?

7. What is moonlighting and how is it affecting the companies in India? Is it a punishable offence under the law?

8. As online/online-facilitated consumption becomes common, why must India remain dependent on time- & resource-heavy offline resolution? What are the challenges and way forward for consumer dispute resolution in India?

9. Given the incredibly high value of space objects and the amount of debris that can be generated by an anti-satellite (ASAT) test, the resulting damages could be incredibly high. Discuss the need for potential norms against ASAT tests can be used to hold states liable for possible damages.

10. How does the Graded Response Action Plan work? How are the planned measures different in 2022?

11. Securing access to key minerals is critical for building resilient and indigenous supply chains for clean energy technologies. What are the challenges and ways to ensure resilient supply chains of key minerals?

12. What is the Buddhist Conversion Day and how is Dr. B.R. Ambedkar linked to the event? What is Navayana Buddhism? What are the rituals followed and what do they signify?

13. 'Calls for developing and transferring technologies to support action on climate change have become louder worldwide. Technology, at best, can assist us, not lead us, on the pathway to a sustainable, regenerative and equitable world'. Elaborate.

14. 'Mission Karmayogi is about creating a civil service with domain, technological competencies and empathy'. Elaborate the given statement with various related case studies.

15. 'Investing in deep, critical technology is the first step in making India a developed nation.' Comment.

16. The phenomenon of urban floods reveals a commonality of causes that combine matters of urban planning and urban governance across India's cities. Elaborate the rising challenge of urban floods in India and a suitable mitigation strategy.

17. 'India can lead the global discourse on food and nutrition security by showcasing home-grown solutions and best practices, and championing the principle of leaving no one behind'. Comment.

18. 'The non-state actors are engaging in hybrid warfare and distorting day-to-day practices while states lack the necessary resilience to face a variety of multi-vector threats'. In the light of above statement, discuss various threats and challenges to cyber-security in India.

19. Recently, the International Monetary Fund (IMF) lauded India's Direct Benefit Transfer (DBT) Scheme as a "logistical marvel". Discuss how the Direct Benefit Transfer has transformed the welfare aspect of the governance in India.

20. Why does China keep blocking the names India suggests for listing under the United Nations Security Council's list of terrorists who are affiliated to the Al Qaeda and ISIS? What is the mandate of the 1267 Committee that was set up in 1999 by the United Nations?

21. Give a brief note on Official Language Committee. What are the major recommendations of the 11th volume of the Report of the Official Language Committee submitted to the President of India recently?

22. 'India needs an appropriate strategy to fight the production, the spread and the sharing of online Child Sexual Abusive Material (CSAM)'. What are the various initiatives taken by Indian Government in this front and what needs to be done?

23. What is the task of the Financial Action Task Force (FATF)? How does FATF work and what do 'grey lists' and 'black lists' refer to?

24. 'The recently inaugurated bio-energy plant to use of paddy straw to produce compressed bio gas in Punjab is one that is replicable across India, and can transform the rural economy.' Elaborate.

25. What is the transgenic hybrid mustard DMH-11 that has been cleared by the Genetic Engineering Appraisal Committee for field trials? Why did the clearance take so long, and what happens here onward?

26. Mission LiFE launched by Indian Prime Minister is the mantra to reverse historical and cultural wrongs wreaked upon the environment. Discuss how it is the call to action for citizens and governments to save the planet?

27. Discuss why the upcoming COP27 in Egypt, should focus on the economic benefits of decarbonisation?

Also discuss how the upcoming COP27 is a chance for India to strongly back environmentally sustainable development in its national interest?

28. Why are issues such as food security, energy and biodiversity on top of the agenda at the upcoming COP27 summit in Egypt? What are world leaders expected to do? What will be India's contribution at the summit?

29. Give a brief note the agenda of Biden administration's recently launched National Security Strategy (NSS). What does the NSS holds for India in terms of both bilateral and multilateral partnership?

PRACTICE QUESTION FOR UPSC PRELIMS EXAM

ANSWER KEY

1.	(a)	2.	(b)	3.	(c)	4.	(d)	5.	(a)	6.	(a)	7.	(b)	8.	(c)	9.	(d)	10.	(a)
11.	(a)	12.	(b)	13.	(c)	14.	(d)	15.	(a)	16.	(a)	17.	(b)	18.	(c)	19.	(d)	20.	(a)
21.	(a)	22.	(b)	23.	(c)	24.	(d)	25.	(a)	26.	(a)	27.	(b)	28.	(c)	29.	(d)	30.	(a)
31.	(a)	32.	(b)	33.	(c)	34.	(d)	35.	(a)	36.	(a)	37.	(b)	38.	(c)	39.	(d)	40.	(a)
41.	(a)	42.	(b)	43.	(c)	44.	(d)	45.	(a)	46.	(a)	47.	(b)	48.	(c)	49.	(d)	50.	(d)
51.	(a)	52.	(b)	53.	(c)	54.	(d)	55.	(a)	56.	(a)	57.	(b)	58.	(c)	59.	(d)	60.	(a)
61.	(a)	62.	(b)	63.	(c)	64.	(d)	65.	(a)	66.	(a)	67.	(b)	68.	(c)	69.	(d)	70.	(a)
71.	(a)	72.	(b)	73.	(c)	74.	(d)	75.	(a)	76.	(a)	77.	(b)	78.	(c)	79.	(d)	80.	(a)
81.	(a)	82.	(b)	83.	(c)	84.	(d)	85.	(a)	86.	(a)	87.	(b)	88.	(c)	89.	(d)	90.	(c)
91.	(a)	92.	(b)	93.	(c)	94.	(d)	95.	(a)	96.	(a)	97.	(b)	98.	(c)	99.	(d)	100.	(a)
101.	(a)	102.	(b)	103.	(c)	104.	(d)	105.	(a)	106.	(a)	107.	(b)	108.	(c)	109.	(d)	110.	(a)
111.	(a)	112.	(b)	113.	(c)	114.	(d)	115.	(d)	116.	(a)	117.	(b)	118.	(c)	119.	(d)	120.	(a)
121.	(a)	122.	(b)	123.	(c)	124.	(d)	125.	(a)	126.	(a)	127.	(b)	128.	(c)	129.	(d)	130.	(a)
131.	(a)	132.	(b)	133.	(c)	134.	(d)	135.	(a)	136.	(a)	137.	(b)	138.	(c)	139.	(d)	140.	(c)
141.	(a)	142.	(b)	143.	(c)	144.	(d)	145.	(a)										

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