

**R.C. Reddy IAS Study Circle**  
**CURRENT AFFAIRS TEST SERIES- CSE PRELIMS 2024**  
**CURRENT AFFAIRS TEST-5 - (September 2023)**

**Test Solutions**

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Q1 ANSWER (a)

Explanation:

**About ENTAZIA**

- **It is a biofungicide crop protection product formulated with *Bacillus subtilis*.**
- It was developed by FMC India.
- It will provide farmers with a powerful and sustainable tool to protect their crops from fungi while maintaining environmental integrity.

**Advantages:**

- **It leverages the natural capabilities of *Bacillus subtilis* to control bacterial leaf blight, one of the most serious diseases of rice.**
- By activating the crop's defense system against plant pathogens, it acts to prevent and control bacterial leaf blight, while staying harmless to natural predators and parasites.
- The biological product promotes natural pest defense by utilizing the naturally occurring *Bacillus subtilis* to establish a robust line of defense against bacterial leaf blight.
- By fostering a healthy plant microbiome, it bolsters plants' resilience to stress factors and contributes to overall growth and vigor.
- It can be applied in an integrated pest management program with FMC's bio-stimulants and synthetic fungicides for additional plant benefits.

Q2 ANSWER (b)

Explanation:

**About Jais:**

- **It is a bilingual Arabic-English model that has been trained on a massive dataset of text and code.**
- It can be used for a variety of tasks, such as machine translation, text summarization, and question answering.
- It was trained on the Condor Galaxy, the world's largest AI supercomputer, using 116 billion Arabic tokens and 279 billion English tokens.
- It is also open-source, which means that anyone can use it or contribute to its development.
- It is available to download on the Hugging Face machine learning platform.
- **The release of Jais is a significant step forward for the development of AI in the Arabic world.**

**What are Large Language Models?**



- **These are deep learning algorithms that can recognize, summarize, translate, predict, and generate content using very large datasets.**
- **The popular ChatGPT AI chatbot is one application of a large language model. It can be used for a myriad of natural language processing tasks.**

**The nearly infinite applications for LLMs also include:**

- **Retailers and other service providers can use large language models to provide improved customer experiences through dynamic chatbots, AI assistants and more.**
- **Search engines can use large language models to provide more direct, human-like answers.**
- **Life science researchers can train large language models to understand proteins, molecules, DNA and RNA.**

**Q3 ANSWER (c)**

**Explanation:**

**About Liquid Apogee Motor:**

- **It is a small but powerful engine going by the acronym ‘LAM’ will have a critical role to play in the Indian Space Research Organisation’s (ISRO) upcoming Aditya-L1 mission meant to study the sun. Statement 2 is correct.**
- **The successful operation of LAM is vital to ISRO’s plans to place the Aditya spacecraft in a halo orbit at Lagrange point L1.**
- **Such engines are used for orbital adjustment manoeuvres of satellites/spacecraft in orbit. Statement 1 is correct.**
- **It is developed by the Liquid Propulsion Systems Centre (LPSC), the ISRO centre for liquid and cryogenic propulsion in Thiruvananthapuram.**

**Key facts about Aditya-L1 mission**

- **It is the first space-based Indian mission to study the Sun.**
- **It will be launched by the PSLV-XL launch vehicle.**
- **The spacecraft shall be placed in a halo orbit around the Lagrange point 1 (L1) of the Sun-Earth system, which is about 1.5 million km from the Earth.**
- **A satellite placed in the halo orbit around the L1 point has the major advantage of continuously viewing the Sun without any occultation/eclipses.**
- **This will provide a greater advantage in observing solar activities and their effect on space weather in real-time.**
- **The spacecraft carries seven payloads to observe the photosphere, chromosphere and the outermost layers of the Sun (the corona) using electromagnetic and particle and magnetic field detectors.**

**Q4 ANSWER (c)**

**Explanation:**

**Context:**



**The United Nations has recognised a new guidance on children's rights with a special focus on climate change.**

### **Background**

- **The United Nations Committee on the Rights of the Child has explicitly affirmed the children's right to a clean, healthy and sustainable environment.**
- **It issued a comprehensive interpretation of Member States' obligations under the UN Convention on the Rights of the Child.**
- This Convention, created in 1989 and ratified by 196 states, outlines universal children's rights such as the right to life, survival and development, and the right to health.

### **What is a General Comment?**

- **General Comment is a document which clarifies the content of the rights set out in a treaty in question.**
- It sometimes outlines potential violations of those rights and offers advice to states parties on how best to comply with their obligations under the treaty.

### **General Comment No. 26**

- **It provides a legal framework to address the adverse effects of environmental degradation and climate change on the enjoyment of children's rights.**
- **It specifies that States are responsible not only for protecting children's rights from immediate harm, but also for foreseeable violations of their rights in the future due to States' acts — or failure to act — today.**
- Furthermore, it underlines that States can be held accountable not only for environmental harm occurring within their borders, but also for the harmful impacts of environmental damage and climate change beyond their borders.

Q5 ANSWER (c)

Explanation:





- Greece is located in the southeastern region of the European continent, on the far southern edge of the Balkan Peninsula.
- Greece lies at the juncture of the continents of Europe, Asia and Africa. It is positioned both in the Northern and Eastern hemispheres of the Earth.
- Greece is bordered by North Macedonia and Bulgaria in the north, Albania in the northwest, and Turkey in the northeast.
- It is also bounded by the Aegean Sea in the east, Ionian Sea in the west, the Cretan Sea and the Mediterranean Sea in the south.

Q6 ANSWER (b)

Explanation:

**About IPBES:**

- It is an independent intergovernmental body established in 2012.
- It provides policymakers with objective scientific assessments about the state of knowledge regarding the planet's biodiversity, ecosystems and the benefits they provide to people, as well as the tools and methods to protect and sustainably use these vital natural assets. Statement 1 is correct.
- This independent body was inspired by the Intergovernmental Panel on Climate Change (IPCC) and the Millennium Ecosystem Assessment.
- It is not a United Nations body. However, at the request of the IPBES Plenary and with the authorisation of the UNEP Governing Council in 2013, the United Nations



Environment Programme (UNEP) provides secretariat services to IPBES. **Statement 2 is incorrect.**

- **India is a member country of this organisation. Statement 3 is correct.**

#### **Organisation's structure**

- **Plenary:** The governing body of IPBES – made up of the representatives of IPBES member States – usually meets once per year.
- **Observers:** Any State not yet a member of IPBES; the Convention on Biological Diversity (CBD) and other biodiversity-related conventions; related UN bodies; as well as many other relevant organisations and agencies.
- **Bureau:** Comprising the IPBES Chair, four Vice-Chairs and five additional officers who oversee the administrative functions of IPBES.
- **Multidisciplinary Expert Panel (MEP):** Five expert participants from each of the five UN regions overseeing all IPBES scientific and technical functions.
- **Stakeholders:** All contributors to and end-users of the IPBES outputs.
- **Expert Groups & Taskforces:** Selected scientists and knowledge holders carrying out the IPBES assessments and other deliverables.
- **Secretariat (Includes Technical Support Units):** Ensures the efficient functioning of IPBES through support to the Plenary, Bureau and MEP, as well as implementing the Platform's work and administrative functions.

#### **Q7 ANSWER (c)**

Explanation:

#### **About Financial Action Task Force (FATF)**

- **FATF is an inter-governmental policy-making and standard-setting body dedicated to combating money laundering and terrorist financing. Statement 1 is correct.**
- **Objective:** To establish international standards and to develop and promote policies, both at national and international levels, to combat money laundering and the financing of terrorism.
- It makes recommendations for combating financial crime, reviews members' policies and procedures, and seeks to increase acceptance of anti-money laundering regulations across the globe.

#### **Formation:**

- **It was established in 1989 during the G7 Summit in Paris to develop policies against money laundering.**
- **In 2001, its mandate expanded to include terrorism financing. Statement 2 is correct.**
- **Headquarters:** Paris, France.

#### **Membership:**



- FATF members include 39 countries, including the United States, India, China, Saudi Arabia, Britain, Germany, France, and the EU as such.
- **India became a member of FATF in 2010. Statement 3 is correct.**
- FATF, as part of its efforts, maintains two types of lists - the greylist and the blacklist.
- **Jurisdictions under Increased Monitoring (i.e. "grey list").**
- **High-Risk Jurisdictions subject to a Call for Action (i.e. "black list"). Statement 4 is incorrect.**
- **Three countries, North Korea, Iran, and Myanmar, are currently in FATF's blacklist.**

#### **Consequences of being on the FATF blacklist:**

- No financial aid is given to them by the International Monetary Fund (IMF), the World Bank, the Asian Development Bank (ADB) and the European Union (EU).
- They also face a number of international economic and financial restrictions and sanctions.

#### **Q8 ANSWER (d)**

Explanation:

- **Bori -This is a Tani language spoken by indigenous tribal people in Arunachal Pradesh.**
- **Rengma – A Sino-Tibetan language spoken by the Rengma tribe living in Nagaland and parts of Assam.**
- **Kokborok – This is the main native language of Borok or the people of Tripura.** Spoken by approx. 918000 people in India and 122,000 people in Bangladesh. Kokborok is also a Sino-Tibetan language with Bhamraputran and Bodo. They got the name from the Twipra Kingdom, now known as Tripura.
- **Limbu – This is a Sino-Tibetan language spoken by the people of Eastern Nepal and some parts of India namely Darjeeling and Sikkim.**

#### **Q9 ANSWER (d)**

Explanation:

#### **Context:**

Recently, RAMBHA-LP payload on board Chandrayaan-3's lander Vikram has completed the first in-situ measurements of the surface-bound lunar plasma environment over the south polar region. Statement 1 is correct.

#### **About RAMBHA-LP Payload:**

- **The Radio Anatomy of Moon Bound Hypersensitive ionosphere and Atmosphere - Langmuir Probe, named after American chemist and physicist Irving Langmuir, who was awarded the Nobel Prize in Chemistry.**
- **It is a device used for characterising plasma.**



- The probe operates without interruption, aiming to explore the changes occurring in the near-surface plasma environment throughout the lunar day. Statement 2 is correct.
- The device features a 5 cm metallic spherical probe mounted on a 1-metre boom attached to the Chandrayaan-3 lander's upper deck.
- It was led by Space Physics Laboratory (SPL), Vikram Sarabhai Space Centre (VSSC), Thiruvananthapuram.

### Key findings

- The initial assessment indicates that the plasma near the lunar surface is relatively sparse.
- It is characterised by a number density ranging from approximately 5 to 30 million electrons per cubic meter.
- This evaluation specifically pertains to the early stages of the lunar daytime.



Q10 ANSWER (d)

Explanation:

### Context

The Kakrapar Nuclear Power Plant-3, biggest indigenously developed variant of the Pressurised Heavy Water Reactor (PHWR) in Gujarat has started its operations at full capacity.

About the Kakrapar Nuclear Power Plant:

- The Kakrapar Nuclear Power Plant is the nation's first 700 MWe (megawatt electric) plant.



- **It is the largest Pressurized Heavy Water Reactor (PHWR) version to be designed domestically.**
- It has advanced safety features like steel-lined inner containment to reduce any leakages, passive decay heat removal system, containment spray system, hydrogen management system etc.
- In 2020, it had attained criticality (when each fission event releases a sufficient number of neutrons to sustain an ongoing series of reactions).

### **India's 3 stage Nuclear Program**

- India's three-stage nuclear power programme was created in 1954 by Dr. Homi Bhaba. It was designed to give energy security to India.
- **The primary objective was to use India's large thorium reserves while considering its small uranium reserves.**
- **India holds 25% of the world's thorium reserves but 2% of the world's uranium reserves.**
- This Program was developed to facilitate this and eventually develop nuclear power from its thorium supplies.

### **The stages of the Program are:**

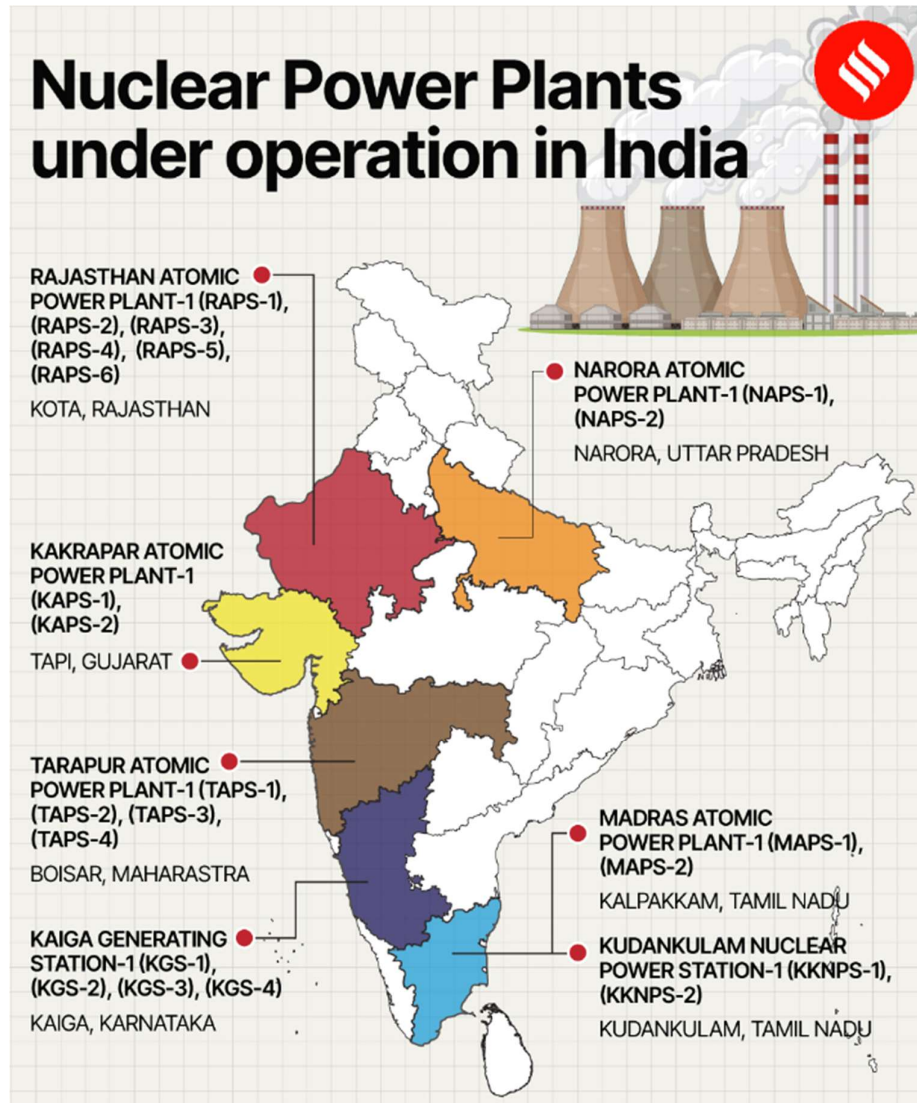
- **Natural uranium-fueled Pressurised Heavy Water Reactors (PHWRs),**
- **Fast breeder reactors (FBRs) using plutonium-based fuel,**
- **Advanced nuclear power systems using thorium.**

### **Key Facts**

- **Types of reactors: Depending on the choice of fuel, moderator and coolant, different types of reactors are built. They include Light Water Reactors (LWRs), which are also called Boiling Water Reactors (BWRs); Pressurised Heavy Water Reactors (PHWRs); Gas-Cooled, Graphite-Moderated Reactors (GCR); and Advanced Gas-Cooled Reactors (AGR).**
- **India has 15 indigenously built PHWRs operating in different parts of the country.**
- **PHWRs: It is a nuclear power reactor that burns naturally occurring uranium without enrichment. The Deuterium oxide, D<sub>2</sub>O (Heavy Water) acts as coolant and moderator.**
- In the first stage, the PHWRs use natural uranium as fuel and heavy water as moderator and coolant. In the second stage, the plutonium reprocessed from the PHWRs and uranium will be used as fuel in the breeder reactors.
- **Natural uranium: It contains two kinds of isotopes uranium-238 and uranium-235. It contains 99.3 percent of uranium-238, which is not a fissile material, and only 0.7 per cent of uranium-235, which is a fissile material.**
- **Heavy water is used as a moderator because one cannot afford to lose neutrons, and the deuterium in it has a tendency to absorb fewer neutrons.**
- **Enriched uranium: If the non-fissile U-238 is removed from natural uranium, then the U-235 concentration will go up. This is known as uranium enrichment.**
- **Reprocessing: The spent fuel, which comes out of the operation of a nuclear power reactor, will contain some U-235, which may not have undergone fission.**



# Nuclear Power Plants under operation in India



Q11 ANSWER (c)

Explanation:

**Context:**

Reserve Bank of India (RBI) Governor Shaktikanta Das has been rated 'A+' in the Central Banker Report Cards 2023.

**About:**

- The Central Banker Report Cards, published annually by Global Finance since 1994, grade the central bank governors of 101 key countries.
- Global Finance's annual Central Banker Report Cards celebrate those bank governors whose strategies outperformed their peers through originality, creativity and tenacity.



- The Bank Governors who earned an 'A+' grade in the Global Finance Central Banker Report Cards 2023 is Shaktikanta Das from India, Thomas J. Jordan (Switzerland) and Nguyen Thi Hong (Vietnam).

Q12 ANSWER (c)

Explanation:

### Context

The Technology Development Board (TDB) has introduced a project called "Development and Commercialization of Intelligent Water Body Management System (IWMS)-TAMARA.

### About the Project

- This project is in line with AMRUT 2.0 mission which has the specific goal of preserving water bodies and promoting a circular water economy, aligning with the principles of Blue Economy.
- It is a smart aeration system with sensors and IoT-based technology to manage water quality. Statement 1 is correct.
- It not only improves wastewater but also ensures that water bodies and aquaculture ponds stay clean and healthy.

This system comprises of several key elements:

- **Smart Sediment Aeration System:** It helps to bring more oxygen to the bottom of water bodies.
- **Smart Climate-Driven Water Quality Monitoring System:** It helps to control the level of nutrients in the water and how much oxygen is in it.
- **Smart Weed Harvester System (PLASHBOT):** This system removes unwanted plants from water bodies. Statement 2 is correct.
- **Communication System and Data Protection:** This system uses a special kind of technology to send and receive data between devices.



Q13 ANSWER (d)

Explanation:

**What is a Cess?**

- **Cess is a form of tax charged/levied over and above the base tax liability of a taxpayer. Statement 1 is correct.**
- **A cess is usually imposed additionally when the state or the central government looks to raise funds for specific purposes.**
- For example, the government levies an education cess to generate additional revenue for funding primary, secondary, and higher education.
- **Cess is not a permanent source of revenue for the government, and it is discontinued when the purpose of levying it is fulfilled. Statement 2 is correct.**
- **It can be levied on both indirect and direct taxes. Statement 3 is correct.**

**What is the difference between tax and cess?**

- Cess is different from taxes such as income tax, GST, and excise duty, etc., as it is charged over and above the existing taxes.
- **While all taxes go to the Consolidated Fund of India (CFI), cess may initially go to the CFI but has to be used for the purpose for which it was collected.**
- **If the cess collected in a particular year goes unspent, it cannot be allocated for other purposes. Statement 4 is correct.**
- The amount gets carried over to the next year and can only be used for the cause it was meant for.
- The central government does not need to share the cess with the state government either partially or in full, unlike some other taxes.

Q14 ANSWER (d)

Explanation:

**About Urban Infrastructure Development Fund (UIDF):**

- **UIDF is established through the use of priority sector lending shortfall. Statement 1 is correct.**
- **Purpose: The Fund will be used by public agencies to create urban infrastructure in tier-2 and tier-3 cities. Statement 2 is correct.**
- **The focus will be on basic services like sewerage and Solid Waste Management, water supply and sanitation, construction and improvement of drains/storm water drains, etc., and impact-oriented projects will be prioritized.**
- **It is managed by the National Housing Bank.**
- The initial corpus for this Fund is ₹10,000 crore.
- **It is established on the lines of the Rural Infrastructure Development Fund (RIDF).**



- States will be encouraged to leverage resources from the grants of the 15th Finance Commission, as well as existing schemes, to adopt appropriate user charges while accessing the UIDF.
- It currently covers 459 tier-2 cities and 580 tier-3 cities.

#### **UIDF Loans:**

- The interest rate on UIDF loans has been kept at Bank Rate minus 1.5 per cent.
- The loan (Principal) will be repayable in five equal annual instalments within seven years from the date of draw, including a moratorium period of two years.
- Interest will be payable on a quarterly basis.

#### **What is tier-2 and tier-3 cities?**

- **The NHB, the nodal agency for the implementation of the UIDF, defines tier-2 cities as those with a population of 50,000 to less than a lakh, and tier-3 cities as those between one lakh to less than a million as per the 2011 census.**

#### **Q15 ANSWER (a)**

Explanation:

#### **About Stem cell therapy:**

- **It is a form of regenerative medicine designed to repair damaged cells within the body by reducing inflammation and modulating the immune system. Statement 1 is correct.**
- This phenomenon makes stem cell therapy a viable treatment option for various medical conditions.

#### **Process involved:**

- **Harvesting:** The process of collecting the stem cells to be used in the transplant, either from you or a donor.
- **Conditioning:** Treatment to prepare your body for the transplant.
- **Transplanting the stem cells.**

#### **What are stem cells?**

- These are cells from which all other cells, with their respective specialised functions, are generated.
- The human body, under certain conditions, “divides” stem cells to either create new stem cells or cells with specific functions, such as blood cells, brain cells, bone cells, muscle cells, etc.

#### **There are two main categories of stem cells:**

- **Pluripotent stem cells:** With the ability to differentiate into all of the cells of the adult body. **Statement 2 is incorrect.**
- **Adult stem cells:** These are tissue or organ-specific and regenerate to form cells only of that particular organ. **Statement 3 is incorrect.**



Q16 ANSWER (d)

Explanation:

**Context:**

Recently the government has announced a 'Special Session of Parliament' which will take place from Sept 18-22.

- **The Constitution does not use the term "special session". However, Article 352 (Proclamation of Emergency) of the Constitution does refer to a "special sitting of the House".**
- **The term "special session" refers to sessions the government has convened for specific occasions, like commemorating parliamentary or national milestones.**
- **Parliament added the part relating to the special sitting through the Constitution (42th Amendment) Act, 1978.**
- Its purpose was to add safeguards to the power of proclaiming Emergency in the country.
- **It specifies that if a Proclamation of Emergency is issued and Parliament is not in session then 1/10th of Lok Sabha MPs can ask the President to convene a special meeting to disapprove the Emergency.**
- **India's Parliament has no fixed calendar of sittings. Statement I is incorrect.**
- The government determines the date and duration of parliamentary sessions.
- **Cabinet Committee on Parliamentary Affairs determines the date and duration of parliamentary sessions. Statement II is correct.**
- It currently has 10 Ministers including ministers of Defence, Home, Finance, Agriculture, Tribal Affairs, Parliamentary Affairs, and Information and Broadcasting.
- **The Law Minister and the Minister of State for External Affairs are special invitees to the Cabinet Committee on Parliamentary Affairs.**
- **The President is informed about the Committee's decision, who then summons Members of Parliament to meet for the session.**

Q17 ANSWER (b)

Explanation:





Q18 ANSWER (c)

Explanation:



Q19 ANSWER (b)

Explanation:



**Context:**

**The Ministry of Education has decided to organise a literacy week to celebrate International Literacy Day under ULLAS- Nav Bharat Saksharta Karyakram.**

**About**

- It enables mass participation to inculcate a sense of Kartavya Bodh and Janbhagidari in each and every citizen of the nation.
- It will make India fully literate and to increase the number of registrations for learners and volunteers on the ULLAS mobile app.

**ULLAS- Nav Bharat Saksharta Karyakram on Education for All**

- **It is a Centrally Sponsored Scheme (jointly funded by the Centre and states) and was implemented during FYs 2022-27 in alignment with National Education Policy (NEP) 2020. Statement 1 is incorrect.**

**The Scheme has five components, namely**

- Foundational Literacy and Numeracy
- **Critical Life Skills**
- Basic Education
- **Vocational Skills**
- Continuing Education. **Statement 2 is correct.**

**The slogan for the scheme is 'Jan Jan Sakshar'.**

**Aims:**

- **The scheme will cover non-literates of the age group of 15 years and above in all state/UTs in the country.**
- By utilizing technology, it seeks to widen access to fundamental literacy and important life skills.
- The DIKSHA Portal acts as a digital portal for students to access a variety of learning resources.

Q20 ANSWER (b)

Explanation:

**Context:**

**The Ministry of Jal Shakti released the report on the 6th census on minor irrigation schemes.**

**About**

- **So far, five censuses have been conducted with reference year 1986-87, 1993-94, 2000-01, 2006-07 and 2013-14 respectively.**
- **The 6th minor irrigation census with reference year 2017-18 was completed in 32 States/ UTs.**



- The census was conducted under the centrally sponsored scheme “Irrigation Census”.
- A sound and reliable data base for minor irrigation schemes is essential for effective planning and policy making in this sector.

### **Major Findings**

**Total MI schemes: 23.14 million minor irrigation (MI) schemes have been reported in the country, out of which 94.8% are Ground Water (GW) and 5.2% are Surface Water (SW) schemes.**

- There has been an increase of about 1.42 million in MI schemes during 6th MI census as compared to 5th Census.

**Share under the scheme:** Ground water still accounts for a major share (94.8%) of all the minor irrigation schemes in the country.

- **Dug-wells have the highest share in MI schemes followed by shallow tube-wells, medium tube-wells and deep tube-wells. Statement 1 is correct.**

**Leading States:** Uttar Pradesh possesses the largest number of MI schemes in the country followed by Maharashtra, Madhya Pradesh and Tamil Nadu. Statement 2 is correct.

**A majority of MI schemes (96.6%) are under private ownership. Statement 3 is incorrect.**

**Gender of the owner:** For the first time, the information about gender of the owner of the MI scheme was also collected in case of individual ownership.

- Out of all the individually owned schemes, 18.1% are owned by women.

**Source of Energy:** Majority of these schemes (76%) utilize electricity as a source of energy followed by diesel (22.2%). Statement 4 is incorrect.

**Water use Efficiency:** There has been an improvement in water use efficiency and decline in wastage of water through use of improved water distribution devices over the years.

### **What are Minor Irrigation Schemes?**

- **Irrigation schemes using either groundwater or surface water and having a Culturable Command Area up to 2000 hectare individually are categorized as Minor Irrigation Schemes.**
- CCA is the area which can be irrigated from a scheme and is fit for cultivation

**The schemes have been categorized broadly into six major types;**

- Dugwell
- Shallow tubewell
- Medium Tubewell
- Deep tubewell
- Surface flow schemes and
- Surface lift schemes.

Minor Irrigation plays an important role in the development of agriculture and livelihoods particularly in drought prone areas and areas outside command of Major and Medium projects.



Q21 ANSWER (b)

Explanation:

**Context:**

**The Law Ministry has outlined a term of reference to examine if a constitutional amendment to facilitate simultaneous polls would have to be ratified by the states.**

**Amending by Simple majority**

- Admission or establishment of new states.
- Formation of new states and alteration of areas, boundaries or names of existing states.
- **Abolition or creation of legislative councils in states.**
- **Second Schedule—emoluments, allowances, privileges and so on of the president, the governors, the Speakers, judges, etc.**
- Quorum in Parliament.
- **Use of official language**

**Amending by Special majority**

- Fundamental Rights;
- **Directive Principles of State Policy;** and
- All other provisions which are not covered by the first and third categories.

**By Special Majority of Parliament and Consent of States**

- The following provisions can be amended in this way:
- Election of the President and its manner.
- **Extent of the executive power of the Union and the states.**
- Supreme Court and high courts.
- Distribution of legislative powers between the Union and the states.
- Any of the lists in the Seventh Schedule.
- Representation of states in Parliament.
- Power of Parliament to amend the Constitution and its procedure (Article 368 itself).

Q22 ANSWER (a)

Explanation:

**Context**

**UNDP has developed a software, called the National Carbon Registry.**

**About National Carbon Registry:**

- **This software has recently been accredited as a digital public good (DPG).**
- **As a DPG, the registry uses open-source code, which allows countries to replicate and adapt the information to fit their own needs and contexts.**



- The registry's modules, software and technical documentation can be reused and tailored by countries, which could potentially reduce production costs and implementation timelines.
- **The registry follows national and international best practices, which include UNDP, the World Bank, the United Nations Framework Convention on Climate Change (UNFCCC) and the European Bank for Reconstruction and Development (EBRD).**

#### **Key Facts about the United Nations Development Programme**

- **It is the United Nations' lead agency on international development.**
- It works in 170 countries and territories to eradicate poverty and reduce inequality.
- **It helps countries to develop policies, leadership skills, partnering abilities, and institutional capabilities and to build resilience to achieve the Sustainable Development Goals.**
- Its work is concentrated in three focus areas: sustainable development, democratic governance and peacebuilding, and climate and disaster resilience.

Q23 ANSWER (d)

Explanation:

**Context:**

**Marut Drones recently secured type certification approvals from the Director General of Civil Aviation (DGCA) for its AG-365S kisan drone for use in agriculture.**

**About AG 365S:**

- **It is a multi-utility agricultural drone in the small category (less than 25kg).**
- It has been designed and developed by Marut Drones; an Indian drone technology company based in Hyderabad.
- **Purpose: The made-in-India kisan drone – AG 365 has been developed particularly for agricultural purposes to reduce crop loss, lower agrochemical usage, better yield and profits to the farmers. Statement 1 is correct.**
- **It is the first multi-utility agriculture small-category drone to receive the DGCA-approved type certificate in India. Statement 2 is correct.**

**Features:**

- The AG-365S drone has the highest endurance of 22 minutes.
- **It is equipped with advanced obstacle and terrain sensors, which enables safe and smooth operations even in rough and patchy terrains.**
- **It is equipped with multiple payloads, and one AG-365S can be used for spraying pesticides, granular spreader and also for running RPTO drone training academies.**



Q24 ANSWER (a)

Explanation:

PM-DAKSH Yojana:

- **The Pradhan Mantri Dakshata Aur Kushalata Sampanna Hitgrahi (PM-DAKSH) Yojana is a Central Sector Scheme. Statement 1 is correct.**
- It was launched during 2020-21.
- **The main objective of the Scheme is to enhance competency level of the target groups to make them employable both in self-employment and wage-employment for their socio-economic development. Statement 2 is correct.**
- It is a National Action Plan for skilling marginalized persons covering SCs, OBCs, EBCs, DNTs, Sanitation workers including waste pickers.

**Target Group:**

- **Artisans-** who may be able to improve their revenue generation capacities within their practicing vocations;
- **Women-** who may be able to enter into self-employment and financially empower themselves without neglecting their domestic activities; and
- **Youth-** who may acquire long-term training and specialization in employable vocations and gain a better standing in the job market. **Statement 3 is correct.**

The age criterion of scheme between 18-45 years and income criteria is no income limit for SCs, SafaiKaramcharis Including waste picker and DNT.

The annual family income should be below Rs.3 lakh for OBCs and the EBCs (Economically Backward Classes) annual family income below Rs.1 lakh.

**Nodal Ministry: Ministry of Social Justice & Empowerment (MoSJ&E). Statement 4 is incorrect.**

Q25 ANSWER (c)

Explanation:

**About GRIHA norms:**

- **GRIHA is an acronym for Green Rating for Integrated Habitat Assessment. GRIHA is a Sanskrit word meaning – ‘Abode’.**
- **It is a rating tool** that helps people assesses the performance of their building against certain nationally acceptable benchmarks.
- **It evaluates the environmental performance of a building holistically over its entire life cycle, thereby providing a definitive standard for what constitutes a ‘green building’.** Statement 1 is correct.



- The rating system, based on accepted energy and environmental principles, will seek to strike a balance between the established practices and emerging concepts, both national and international.
- **It is developed by TERI (The Energy and Resources Institute).**
- **This tool has been adopted by the Ministry of New and Renewable Energy. Statement 2 is correct.**

#### **Criteria:**

- It assesses a building out of 34 criteria and awards points on a scale of 100.
- In order to qualify for GRIHA certification, a project must achieve at least 50 points.
- Certain criteria / sub-criteria are mandatory and have to be complied for the project to be at all eligible for rating.

#### **Project scoring**

- 50-60 points is certified as a 1-star GRIHA rated building,
- 61-70 is a 2-star GRIHA rated building,
- 71-80 is a 3-star GRIHA rating building,
- 81-90 is a 4-star GRIHA rated building
- 91-100 is a 5-star GRIHA rated building.

#### **Q26 ANSWER (c)**

Explanation:

#### **About Off-Budget Borrowings:**

- **Definition:** Off-budget borrowings are debts incurred not directly by the government but by public sector units or special purpose vehicles, with principal and interest serviced from the budget. **Statement 1 is correct.**
- **Legislative Oversight:** These borrowings are not subject to legislative scrutiny and are outside the budget. **Statement 2 is correct.**
- **FRBM Act Bypass:** They allow governments to circumvent borrowing limits set under the Fiscal Responsibility and Budget Management (FRBM) Act, 2003.

#### **How are off-budget borrowings raised?**

- **Issuance of Bonds:** The government can ask an implementing agency to raise the required funds from the market through loans or by issuing bonds.
- **Utilizing savings:** For example, the food subsidy is one of the major expenditures of the Centre. In the Budget presentation for 2020-21, the government paid only half the amount budgeted for the food subsidy bill to the Food Corporation of India. The shortfall was met through a loan from the National Small Savings Fund.
- **Borrowing:** Other PSUs have also borrowed for the government. For instance, public sector oil marketing companies were asked to pay for subsidized gas cylinders for PM Ujjwala Yojana beneficiaries in the past.



- **Bank sources:** Public sector banks are also used to fund off-budget expenses. For example, loans from PSU banks were used to make up for the shortfall in the release of fertilizer subsidy.

Q27 ANSWER (b)

Explanation:

**Context:**

**Iran and Afghanistan are locked in a long-standing dispute over the sharing of water from the Helmand River.**

**About Helmand River**

- It originates near Kabul in the western Hindu Kush Mountain range and flows across Afghanistan before it branches just near the border with Iran.
- It flows in a southwesterly direction through desert areas before emptying into Lake Hamun, which straddles the Afghanistan-Iran border.

Q28 ANSWER (a)

Explanation:

**Context:**

**A 13-member technical committee was proposed by the Union government to evaluate the ‘carrying capacity’ of 13 Himalayan States, including cities and eco-sensitive zones.**

**What is carrying capacity?**

- The carrying capacity is the maximum population size that an ecosystem can sustain without getting degraded.
- The population size is limited by environmental factors like adequate food, shelter, water, and mates.
- If these needs are not met, the population will decrease until the resource rebounds.

**Himalayan states and eco-sensitive zones:**

- The Indian Himalayan Region is spread across 13 Indian States/Union Territories, namely Jammu and Kashmir, Ladakh, Uttarakhand, Himachal Pradesh, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura, Assam and West Bengal, stretching across 2500 km.
- Nearly 50 million people reside in this region, which is characterised by a diverse demographic, and versatile economic, environmental, social and political systems.



- **In order to manage and conserve biodiversity, the MoEF notified, in the year 2002, Eco-Sensitive Zones (ESZs) around the Protected Areas, and Ecologically Sensitive Areas (ESA) that have unique biological resources to protect the biodiversity in areas having ecological significance.**
- On the basis of proposals and recommendations of the State Government, the MoEF has notified the ESZs under the Environment (Protection) Act, 1986.
- **Section '3' of the ESZ Notification provides the Guidelines for preparation of the Zonal Master Plan (ZMP) by the respective State Government.**
- As far as the 13 States of Indian Himalayan Region are concerned, 2 ESAs and 92 ESZs have been already notified.

Q29 ANSWER (d)

Explanation:

**Context:**

**The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) released a report on the status of invasive alien species.**

**What are Invasive species?**

- Alien species are animals, plants and microbes that have been introduced by humans to new regions. Of these, invasive alien species have negative impacts on nature.

**The characteristics of invasive alien species are:**

- **Rapid reproduction and growth,**
- **High dispersal ability,**
- **Phenotypic plasticity (ability to adapt physiologically to new conditions), and**
- **Ability to survive on various food types and in a wide range of environmental conditions.**

**Examples of invasive alien species**

- Diseases such as malaria, Zika and West Nile Fever are spread by invasive alien mosquito species like *Aedes albopictus* and *Aedes aegypti*.
- **Spread of water hyacinth (*Pontederia crassipes*) in Lake Victoria has affected the population of tilapia fish** and affected livelihoods and nutrition of people in the area.

Q30 ANSWER (b)

Explanation:

**Context:**

**A study has quantified future harms on Human population caused by carbon emissions.**

**Findings of the study**



- The study found that if global warming reaches or exceeds two degrees Celsius by 2100, it could lead to deaths of roughly a billion people.
- Mainly richer humans would be responsible for the deaths of mainly poorer humans over the next century,
- The oil and gas industry, directly and indirectly emits more than 40 percent of carbon emissions, affecting billions of people in remote and underdeveloped communities.

#### **1,000-tonne rule**

- The study found the human mortality costs of carbon emissions converged on the “1,000-tonne rule”.
- **The rule is an estimate that a future person is killed prematurely every time 1000 tonnes of fossil fuels are burned.**

Q31 ANSWER (d)

Explanation:

#### **About Kuiper Belt:**

- **Kuiper belt, also called the Edgeworth-Kuiper belt, is a flat ring of small icy bodies that revolve around the Sun beyond the orbit of the planet Neptune. Statement 1 is correct.**
- It is named after Gerard Kuiper, a Dutch-American astronomer who hypothesized the existence of such a region in the 1950s.
- There are millions of these icy objects, collectively referred to as Kuiper Belt objects (KBOs) or trans-Neptunian objects (TNOs), in this belt.
- The Kuiper Belt is a region of leftovers from the solar system's early history.
- It is thought to be the source of most of the observed short-period comets, particularly those that orbit the Sun in less than 20 years.
- **Composition: The Kuiper Belt is primarily composed of small icy bodies, such as dwarf planets, asteroids, and comets. Statement 2 is correct.**

#### **Pluto:**

- **Pluto, once considered the ninth planet in our solar system, is one of the most well-known Kuiper Belt objects.**
- In 2006, the International Astronomical Union (IAU) reclassified Pluto as a dwarf planet, partly because of its location within the Kuiper Belt.

Q32 ANSWER (a)

Explanation:

#### **About Project Naman**

- **The Project will entail establishing facilitation and grievance redressal centres for veterans and the kin of personnel who have lost their lives.**



- **The first such centre will be established in Delhi Cantonment.**
- 'Naman' will house a Common Service Centre which will facilitate the veterans and their relatives.
- **It will offer all government-to-customer services and also facilitate the updating of pensioners' accounts on the SPARSH portal of veterans, next of kin and dependents.**

#### **What is SPARSH portal?**

- **It is being implemented by Ministry of Defence for meeting the pension sanction and disbursement requirements for Armed Forces viz. Army, Navy, Air Force and Defence Civilians.**
- The Defence Pensioner will be given a completely transparent view of his pension account through this portal which will capture and maintain a complete history of events and entitlements the pensioner right from the date of commencement of pension to the date of cessation of pension due to his/her last eligible beneficiary.
- This system will be administered by the Defence Accounts Department through the Principal Controller of Defence Accounts (Pensions).

#### **The system would cater to all activities of the pension cycle namely:**

- Initiation and Sanction
- Disbursement
- Revision
- Service and Grievance Request Management.

#### **Q33 ANSWER (b)**

Explanation:

#### **About Lunar Reconnaissance Orbiter (LRO):**

- **It is a NASA spacecraft that was launched on June 18, 2009.**
- **Primary Objective: To make a 3D map of the Moon's surface from lunar polar orbit.**
- **It has also been used to study the Moon's geology, mineralogy, and environment.**
- It orbits the Moon in an eccentric polar mapping orbit.
- LRO is equipped with 7 science instruments, the most well-known of which is a 195-millimeter (7.7-inch) telescope and camera system that can see details up to 2.5 meters across.
- LRO is equipped with a laser altimeter that produces 3D maps by shooting lasers at the surface and measuring reflection times.
- The spacecraft also carries two instruments suited to peering into dark craters to search for signs of water ice, and a temperature instrument that led to the discovery of the coldest place in the solar system.



Q34 ANSWER (c)

Explanation:

**Context:**

**Vijayawada Railway Station was awarded the 'Green Railway Station' certification with the highest rating of Platinum by the Indian Green Building Council (IGBC).**

- **The Indian Green Building Council (IGBC) is part of the Confederation of Indian Industry (CII) was formed in the year 2001. Statement 1 is correct.**
- It is India's Premier certification body.
- **The council offers a wide array of services which include developing new green building rating programmes, certification services and green building training programmes. Statement 3 is correct.**
- The council also organises Green Building Congress, its annual flagship event on green buildings.
- **It is also among the 5 countries that are in the board of World Green Building Council discussing global issues at COP and similar global platforms. Statement 2 is correct.**
- The rating is based on six environmental categories which include sustainable station facility, health, hygiene and sanitation, energy efficiency, water efficiency, smart and green initiatives and innovation and development.
- Headquarter: Hyderabad.

Q35 ANSWER (d)

Explanation:

**About Justice Amitava Roy Committee:**

- **In September 2018, the Supreme Court had formed a Committee on Prison Reforms chaired by former judge, Justice Amitava Roy.**
- **Purpose – To examine the various problems plaguing prisons in the country, from overcrowding to lack of legal advice to convicts to issues of remission and parole.**
- The decision was taken based on a letter from former Chief Justice of India R.C. Lahoti highlighting the overcrowding in prisons, unnatural deaths of prisoners, gross inadequacy of staff and the lack of trained staff.

**Objectives of the Committee –**

- Examine the extent of overcrowding in prisons and correctional homes & recommend remedial measures;
- Availability of legal aid and advice;
- Grant of remission, parole and furlough;
- Reasons for violence in prisons and correctional homes;
- Recommend measures to prevent unnatural deaths and assess the availability of medical facilities in prisons and correctional homes.



- The court asked the committee to complete the collection of data and information and submit the report in a year.

**The committee submitted the final report in December, 2022.**

**Major Findings of the Committee:**

**Crowding among Undertrials –**

- Prisons in India are teeming with people waiting for the completion of trial or investigation, also called undertrials.
- Globally, one in three prisoners are undertrials. In India, three out of four, or about 77% of the total prison population in 2021, were undertrials.

**Conditions of Female Prisoners –**

- Women prisoners face far worse conditions than men in terms of access to basic facilities.
- The report said that prisons only in Goa, Delhi and Puducherry allow female inmates to meet their children without any bars or glass separation.
- Less than 40% prisons provide sanitary napkins to female inmates.
- Only 18% of female prisoners get exclusive women's prison facilities, and functional women's prisons exist in just 15 states and union territories.

**Condition of Transgender Prisoners –**

- Prison authorities of only 13 states and two Union Territories have designated a 'complaint officer' to deal with complaints of violation of rights of transgender inmates in prisons.
- Majority of the states and Union Territories have not formulated welfare schemes for transgender prisoners.

**Number of Suicide Cases –**

- Suicide is a major cause of the 817 unnatural deaths reported in jails across the country between 2017 and 2021.
- out of the 817 unnatural deaths, 660 were suicides with Uttar Pradesh recording the highest number of suicides at 101 during this period.

Q36 ANSWER (b)

Explanation:





Q37 ANSWER (d)

Explanation:

**Context:**

The second earth-bound manoeuvre of the Aditya L-1 mission was performed successfully by the ISRO Telemetry, Tracking and Command Network (ISTRAC), Bengaluru.

**About:**

- The manoeuvre was performed by ISTRAC to attain a new orbit.
- Three more manoeuvres are scheduled, and after the final manoeuvre, Aditya-L1 will undergo a trans-Lagrangian1 insertion manoeuvre, marking the beginning of its 110-day trajectory to the destination around the L1 Lagrange point.
- Upon arrival at the L1 point, another manoeuvre will bind Aditya-L1 to an orbit around L1, a balanced gravitational location between the earth and the sun.
- The satellite spends its whole mission life orbiting around L1 in an irregularly shaped orbit in a plane roughly perpendicular to the line joining the earth and the sun.

**ISRO's Telemetry, Tracking and Command Network (ISTRAC):**

- ISTRAC is entrusted with the major responsibility to provide tracking support for all the satellite and launch vehicle missions of ISRO. Statement 1 is correct.
- It has established a network of ground stations at Bengaluru, Lucknow, Mauritius, Sriharikota, Port Blair, Thiruvananthapuram, Brunei, Biak (Indonesia) and the Deep Space Network Stations to achieve the following objectives: Statement 2 is correct.



- Carrying out mission operations of all operational remote sensing and scientific satellites, providing Telemetry, Tracking and Command (TTC) services from launch vehicle lift-off till injection of satellite into orbit;
- To estimate its preliminary orbit in space and hardware and software developmental activities that enhance the capabilities of ISTRAC for providing flawless TTC and Mission Operations services.

Q38 ANSWER (a)

Explanation:

**Association of Southeast Asian Nations (ASEAN):**

**About:**

- The ASEAN was established on 8 August 1967 in Bangkok, Thailand, with the signing of the ASEAN Declaration (Bangkok Declaration) by the Founding Fathers of ASEAN: Indonesia, Malaysia, Philippines, Singapore and Thailand.
- The organization's goal is to promote stability and economic growth across these nations.
- Its chairmanship rotates annually, based on the alphabetical order of the English names of Member States.
- The region has one of the largest economies in the world, and it is believed that by 2050, it will have the 4th-largest economy in the world.

**Members:**

- ASEAN brings together ten Southeast Asian states – Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam – into one organization.





Q39 ANSWER (d)

Explanation:

**Context:**

**The patent office of Government of India has granted a patent to Botanical Survey of India for ‘reusable straw and its manufacturing’.**

**About:**

- **The reusable straw is developed from a species of endemic bamboo plant (Schizostachyum andamanicum) which is found in the Andamans and Nicobar Islands.**
- **The Schizostachyum andamanicum was discovered on the island about three decades ago and now its economic potential has received a boost with the granting of the patent for reusable straw and its manufacture.**
- This species of bamboo is characterized by a thin large hollow erect culm (stem) with long internodes and has potential for developing into a straw.
- The morpho-anatomical structure of culm internodes of the endemic bamboo was identical to modern synthetic drinking straws which led to the idea for this novel invention.
- It is a novel way to replace plastic straws with an organic alternative. This is a future technology to enhance the economy of farmers and bamboo growers of the island, if they cultivate this endemic bamboo species at a commercial level.

Q40 ANSWER (a)

Explanation:

**Context:**

**Special Protection Group (SPG) Director Arun Kumar Sinha, a 1987-batch Kerala-cadre IPS officer, died.**

- **He was appointed as 12th Director of SPG in 2016, and was designated to serve till May 31, 2024, in the rank and pay of Director-General of Police.**

**The Special Protection Group (SPG):**

- **It was established through an act of Parliament i.e ‘Special Protection Group Act, 1988’. Statement 1 is correct.**

**Constitution and Regulations:**

**The SPG Act provides for the constitution and regulation of an armed force of the Union called the Special Protection Group for providing ‘proximate security’ to:**

- the Prime Minister and the members of his immediate family; and
- any former Prime Minister or to the members of his immediate family.



However, any former Prime Minister or any member of the immediate family of the Prime Minister or of a former Prime Minister may decline proximate security.

**Amendment in SPG Act:**

- **‘Special Protection Group Act, 1988’ was amended in 1999 by the Special Protection Group (Amendment) Act, 1999, in which the ‘proximate security’ is withdrawn from a former Prime Minister, and immediate family members of such former Prime Minister: Statement 5 is correct.**
- Provided that where the level of threat faced by any member of the immediate family of a former Prime Minister warrants proximate security or any other security, such security shall be provided to that member.

**Control and Direction:**

- The Union Government exercised the general superintendence, direction and control and the power to command and supervision are vested in an officer, as the Director of the Group, appointed by the Union Government.
- The Director, to discharge his duties under this Act, be assisted by Inspectors General, Deputy Inspectors General, Assistant Inspectors General and other officers as may be appointed by the Central Government.

**Liability for service in and outside India:**

- **Every member of the SPG shall be liable to serve in any part of India as well as outside India. Statement 2 is correct.**

**Resignation and withdrawal from the post:**

**No member of the Group can:**

- **resign his appointment during the terms of his engagement; or Statement 3 is incorrect.**
- withdraw himself from all or any of the duties of his appointment, except with the previous permission in writing of the prescribed authority.

**Tenure of service:**

**Every member of the Group holds office during the pleasure of the President. Statement 4 is incorrect.**

**Restrictions:**

**No member of the Group shall, without the previous sanction in writing of the Central Government or of the prescribed authority:**

- be a member of, or be associated in any way with, any trade union, labour union, political association; or
- be a member of, or be associated in any way with, any society, institution, association or organisation that is not of a purely social, recreational or religious nature; or
- communicate with the press or publish or cause to be published any book, letter or other document except where such communication or publication is in the bona fide



discharge of his duties or is of a purely literary, artistic or scientific character or is of a prescribed nature.

Q41 ANSWER (d)

Explanation:

**Context:**

**The second meeting of the intergovernmental negotiating committee (INC) had concluded with the member states mandating the INC secretariat to develop a zero draft to end plastic pollution including in the marine environment.**

- **It is an international legally binding instrument to end plastic pollution including in the marine environment.**
- The zero draft has 10 placeholders to discuss issues like the preamble, definitions, principles and scope, in addition to the institutional arrangements and the final provisions.
- **Member states such as Saudi Arabia, Iran, and China at INC-2 stressed the importance of defining the scope of the legally binding instrument.**
- **India had agreed with this proposal.**

Q42 ANSWER (c)

Explanation:

**Context:**

**Recently, the Union Cabinet, chaired by the Hon'ble Prime Minister of India approved the Scheme for Viability Gap Funding (VGF) for development of Battery Energy Storage Systems (BESS).**

- **The approved scheme envisages development of 4,000 MWh of BESS projects by 2030-31. Statement 1 is correct.**

**Funding:**

- **Financial support of up to 40% of the capital cost as budgetary support in the form of Viability Gap Funding (VGF) is provided by the union government. Statement 2 is correct.**
- The VGF shall be disbursed in five tranches linked with the various stages of implementation of BESS projects.
- By offering VGF support, the scheme targets achieving a Levelized Cost of Storage (LCoS) ranging from Rs. 5.50-6.60 per kilowatt-hour (kWh), making stored renewable energy a viable option for managing peak power demand across the country.
- To ensure that the benefits of the scheme reach the consumers, a minimum of 85% of the BESS project capacity will be made available to Distribution Companies (Discoms).



- The selection of BESS developers for VGF grants will be carried out through transparent competitive bidding process, promoting a level playing field for both public and private sector entities.

**Significance:**

- This will not only enhance the integration of renewable energy into the electricity grid but also minimize wastage while optimizing the utilization of transmission networks.
- This will reduce the need for costly infrastructure upgrades.
- The competitive bidding process approach will foster healthy competition and encourage the growth of a robust ecosystem for BESS, attracting significant investments and generating opportunities for associated industries.
- This scheme is designed to harness the potential of renewable energy sources such as solar and wind power, the scheme aims to provide clean, reliable, and affordable electricity to the citizens.

Q43 ANSWER (b)

Explanation:

**Context:**

**Recently, some unusual rocks containing distinctive greenish crystals were found in the Erg Chech sand sea.**

**About Erg Chech 002:**

**What is it?**

- These are the rocks containing distinctive greenish crystals that turned out to be from outer space, left over from the dawn of the Solar System.
- **They were all pieces of a meteorite known as Erg Chech 002, which is the oldest volcanic rock ever found.**
- It is known as an “ungrouped achondrite,” which means their parent bodies and family relationships are unknown.
- Achondrites are rocks formed from melted planetesimals, which are what we call solid lumps in the cloud of gas and debris that formed the Solar System.
- Erg Chech 002 contains a high abundance of lead-206 and lead-207, as well as relatively large amounts of undecayed uranium-238 and uranium-235.
- Aluminium-26 was distributed quite unevenly throughout the cloud of dust and gas which formed the solar system.

**Key facts about Erg Chech**

- **It is a sandy region of the Sahara in western Algeria and northern Mali.**
- **It consists largely of shifting dunes.**



Q44 ANSWER (d)

Explanation:

**About Malaviya Mission:**

- **It aims to provide tailored training programmes for teachers.**
- This programme will work for the capacity building of faculty members in higher educational institutions (HEI).
- It will ensure continuous professional development and help in building capacities of 15 lakh teachers of HEIs through 111 Malaviya Mission centres across India in a time-bound manner.
- It aims to improve the quality of teachers' training, build leadership skills in teachers and help realise the goals of NEP.
- The capacity building under the Mission will be mapped to the credit framework to ensure career progression pathways for educators.
- The Indian Knowledge System has been included in the modules of the Programme.
- Human Resource Development Centres to be revamped and known as Madan Mohan Malaviya Teachers Training Centres.

Q45 ANSWER (b)

Explanation:

**About National Common Mobility Card (NCMC):**

- **NCMC feature enables the Bank's customers to use their Debit Cards as travel cards for travelling in Metro Rail and Buses where this facility is enabled. Statement 1 is correct.**
- **The idea of NCMC was floated by the Nandan Nilekani committee set up by the Reserve Bank of India (RBI). Statement 2 is correct.**
- **NCMC is an initiative of the Ministry of Housing and Urban Affairs in India designed to promote cashless transactions and offer a unified payment platform for commuters. Statement 3 is incorrect.**
- It was launched on March 4, 2019.
- It offers a unified contactless transport solution through the RuPay platform, developed by the National Payments Corporation of India (NPCI).
- NCMC is an automatic fare collection system. It will turn smartphones into an interoperable transport card that commuters can use eventually to pay for Metro, bus and suburban railway services.

**About Nation First Transit Card:**

- **It aims to facilitate a seamless and convenient customer commuting experience and ensure easy digital ticketing fare payments in metro, buses, water ferries, parking, etc., through a single card.**
- In addition, individuals can also use this card for making retail and e-commerce payments.



- It is powered by RuPay and National Common Mobility Card (NCMC) technology.

Q46 ANSWER (c)

Explanation:

**Context:**

**The Central Government recently sought public comments on the draft guidelines for the prevention and regulation of “dark patterns” on the Internet.**

**About Dark Patterns:**

- **Dark patterns are deceptive and manipulative user interface (UI) design techniques employed by websites, apps, and other digital platforms to trick or manipulate users into taking actions they may not intend to take or to make decisions that are not in their best interest.**
- The term “dark patterns” was coined in 2010 by Harry Brignull, a user experience specialist.
- **These patterns are often used to encourage users to sign up for services, make purchases, or share personal information, among other things.**
- **Dark patterns exploit cognitive biases and psychological principles to influence user behaviour.**
- They can range from subtle and mildly misleading to overtly aggressive tactics.
- There are 12 kinds of dark patterns: Friend spam, forced continuity, disguised ads, confirm shaming, bait and switch, hidden costs, roach motel, privacy zuckering, misdirection, price comparison prevention, trick questions, and sneak into basket.
- **For Example: 'Confirm shaming' means using a phrase, video, audio or any other means to create a sense of fear, shame, ridicule or guilt in the mind of the user so as to nudge the user to act in a certain way.**

Q47 ANSWER (d)

Explanation:

**Context:**

**Recently, the National Payments Corporation of India (NPCI) unveiled several new products with an aim to create an inclusive, resilient, and sustainable digital payments ecosystem.**

**Key points about new products:**

**While Credit Line:** It would enable pre-sanctioned credit lines from banks via UPI.

**UPI LITE X**



- It would facilitate offline payments and UPI Tap & Pay would enhance QR Code and Near Field Communication (NFC) technology adoption for digital payment.
- In addition to the conventional Scan and Pay method, users now have the option to simply tap NFC-enabled QR codes at merchant locations to complete their payments.

### **Hello! UPI**

- Conversational Payments on UPI would enable users to make voice-enabled UPI payments via UPI Apps, telecom calls, and IoT devices in Hindi and English, and will soon be available in several other regional languages.

**BillPay Connect:** Conversational Bill Payments, payments can be made across India through a nationalised number made available by Bharat BillPay.

### **About National Payments Corporation of India:**

- **It is an umbrella organisation for operating retail payments and settlement systems in India. Statement 1 is correct.**
- **It is an initiative of the Reserve Bank of India (RBI) and the Indian Banks' Association (IBA) under the provisions of the Payment and Settlement Systems Act, 2007, to create a robust Payment & Settlement Infrastructure in India. Statement 2 is correct.**
- It has been incorporated as a "Not for Profit" Company under the provisions of Section 25 of the Companies Act 1956 (now Section 8 of the Companies Act 2013).
- It is promoted by ten major banks, including the State Bank of India, Punjab National Bank, Citibank, Bank of Baroda, and HSBC.
- The regulatory board of the NPCI, headquartered in Mumbai, includes nominees from the RBI along with nominees from ten core promoter banks.

Q48 ANSWER (a)

Explanation:

**Context:**

**China is set to launch the Wide Field Survey Telescope (WFST) in September.**

**About:**

- **It is the largest time-domain survey facility in the Northern Hemisphere.**

**Objectives:**

- The core scientific objective is to explore and monitor dynamic astronomical events and conduct time-domain astronomical observation research.
- This will enable researchers to detect faint and distant celestial signals, including those from galaxies beyond the Milky Way and galaxy clusters.
- It will also seek out planets or their moons in the Kuiper Belt and beyond.
- It has set out to find and track 10 lakh solar system objects for a comprehensive view of the solar system and its evolution.



- The telescope is located at the Lenghu astronomical observation base in northwest China's Qinghai Province.
- The base, which sits at an average altitude of about 4,000 meters, offers optimal conditions for stargazing due to its clear night skies, stable atmospheric conditions, dry climate, and minimal artificial light pollution.
- It is recognized as one of the best observatory sites on the Eurasian continent.
- The WFST project was launched in July 2019 through a collaboration between the University of Science and Technology of China and the Purple Mountain Observatory under the Chinese Academy of Sciences.

Q49 ANSWER (b)

Explanation:

**Difference between a fixed and floating interest rate:**

- **Fixed interest rates are those that do not change during the tenure of the loan.**
- On the other hand, floating interest rates are subject to market dynamics and the base rate — therefore, the risk differentiation.
- **As also contended by several lending entities, floating interest rates are generally lower than fixed interest rates. For example, if the floating interest rate for home loans is 10.5%, the fixed interest rate would be 12%. Statement 1 is incorrect.**
- It has been widely argued that preference for the floating rate-based regime is to better adjust their positions as per the evolving market dynamics.
- The advantages are transmitted onto the borrower's savings pool, but the opposite also holds true in a rising benchmark rate regime.
- **Also noteworthy is the fact that floating interest rate loans do not draw any prepayment penalty— unlike fixed rate loans. Statement 2 is correct.**
- **However, the fixed rate-based regime endows a borrower with greater certainty and security. This also helps in better planning and structuring of individual budgets. Statement 3 is correct.**

**Context:**

Recently, the Reserve Bank of India (RBI) issued guidelines enabling a borrower to transition from a floating interest rate-based loan to one with a fixed interest rate.

**What exactly has the RBI instructed?**

- **The apex banking regulator has given borrowers the option to switch over to a fixed (interest) rate mechanism for their loans from floating rates.**
- This would be based on a board-approved policy drafted by the lending entity. The policy must also specify the number of times such a switch would be allowed during the tenure.
- The lender must also transparently communicate to the borrower all relevant charges alongside service charges or administrative costs associated with the transition.
- **The borrower would now also have the option to choose between enhancement of the EMI or elongation of the tenure or a combination of both.**



- S/he might also opt to prepay the loan, either in part or full, at any point during the tenure. This would, however, still invite foreclosure charges or prepayment penalty.

Q50 ANSWER (b)

Explanation:

**About Visible Emission Line Coronagraph (VELC) on board Aditya-L1:**

- It is the largest payload that would fly on the Aditya-L1 mission. It is an internally occulted solar coronagraph capable of simultaneous imaging, spectroscopy and Spectro-polarimetry close to the solar limb. Statement 1 is incorrect.
- The VELC consists of a coronagraph, spectrograph, polarimetry module and detectors, aside from auxiliary optics.
- It is built by the Indian Institute of Astrophysics (IIA) at its CREST (Centre for Research and Education in Science and Technology) campus at Hosakote, Karnataka.

**Purpose:**

- It will observe the solar corona, which is the tenuous, outermost layer of the solar atmosphere.
- It will analyse the coronal temperature, plasma velocity, density, etc.
- It will also study Coronal Mass Ejections (CMEs) and the solar wind. Statement 2 is correct.

Q51 ANSWER (c)

Explanation:

**Context:**

Researchers studying the findings of the Solar Orbiter Aircraft, a joint mission by the European Space Agency and the U.S. space agency NASA, recently announced that they have detected picoflare jets from the sun's outer atmosphere.

**About Picoflare jets:**

- These small-scale picoflare jets were observed within emissions from the coronal hole under observation.
- They lasted only a few dozen seconds; scientists calculated that they provide enough energy to supply a considerable fraction of solar winds.
- Pico" is an order of magnitude that denotes 10<sup>-12</sup>, or one trillionth of a unit.
- These jets from the sun are named so because they carry approximately one-trillionth the energy of the largest flares the sun is capable of producing,
- **Significance:** The discovery is important because strong gusts of solar winds, while creating beautiful auroras in polar areas, are capable of disrupting the earth's magnetic field as well as damaging electronics in satellites in space and in circuits on the ground.



### Key facts about Solar Orbiter Aircraft

- It is the most complex scientific laboratory ever to have been sent to the Sun.
- It will take images of the Sun from closer than any spacecraft before.
- It contains six remote-sensing instruments and four sets of in situ instruments.

### Objectives

- To observe the Sun's 11-year cycle of rising and subsiding magnetic activity.
- To study the upper layer of its atmosphere, the corona.
- It was launched in 2020.

### Q52 ANSWER (c)

Explanation:

- **The I-CRR was introduced on August 10, 2023, by the RBI to absorb the surplus liquidity generated by various factors, including the return of Rs 2,000 notes to the banking system. Statement 1 is correct.**
- The level of surplus liquidity in the system surged because of the return of Rs 2,000 banknotes to the banking system, RBI's surplus transfer to the government, pick up in government spending and capital inflows.
- Excessive liquidity can pose risks to price stability and also to financial stability.
- **The banks are mandated to maintain an I-CRR of 10% on the increase in their net demand and time liabilities (NDTL) between May 19, 2023, and July 28, 2023. Statement 2 is correct.**
- **NDTL refers to the total demand and time liabilities (deposits) of the public that are held by the banks with other banks.**
- I-CRR measure is expected to absorb above Rs 1 lakh crore of excess liquidity from the banking system.
- **The Cash Reserve Ratio (CRR) is the minimum amount of the total deposits which banks have to maintain as cash reserve with the Reserve Bank of India.**

### Q53 ANSWER (c)

Explanation:

**Context:**

**Airbus, a leading aircraft manufacturer globally, responds to the Indian Air Force's Request for Information (RFI) for a Medium Transport Aircraft (MTA) with the A400M Atlas.**

**About A400M Atlas:**

- **It is a multi-national four-engine turboprop.**
- **The aircraft is manufactured by Airbus Defence and Space, a division of the European aerospace and defence firm Airbus.**



- It was designed to meet the requirements of the Belgium, French, German, Spanish, Turkish, Luxembourg and UK air forces.
- **It is a multi-role aircraft that serves as both a tactical airlifter and a strategic airlifter.**

#### Features:

- It can carry up to 37 tons of cargo and be used for transport, air-to-air refuelling, and paratroop missions.
- The A400M's normal operating speed is 555km/h, but it can reach a maximum speed of 780km/h.
- The aircraft weighs approximately 76,500kg, and the maximum take-off weight is 141,000kg.
- It stands out for its ability to carry oversized cargo, including vehicles and helicopters.
- The A400M cockpit is fully night-vision compatible and provides accommodation for two pilots and an additional crew member for special mission equipment operations.
- It can carry 116 paratroops and airdrop them and their equipment either by parachute or gravity extraction.
- It can be converted into a tactical tanker that has the ability to refuel a range of aircraft and helicopters.

#### Q54 ANSWER (a)

##### Explanation:

- **It was set up in 2002 (reconstituted in 2008) by the Supreme Court. Statement 1 is correct.**
- **It served as a watchdog for issues pertaining to environmental conservation and compliance. Statement 2 is incorrect.**
- **Recent changes: According to the Union Environment Ministry's notification, instead of an ad hoc body, CEC should be instituted as a permanent statutory body on environmental issues.**

#### Composition of the new CEC:

- It will have a chairman with experience of 25 years in the field of environment, forests and wildlife or proven administrative experience of not less than 25 years in the central or state governments.
- He will be nominated by the central government for tenure of three years.
- Age limit 66 years and the level, not below the rank of additional secretary.
- The member secretary will be a full-time serving officer of the government not below the rank of Deputy Inspector General of forests or director in the Government of India.
- This person is required to have special knowledge in the field of environment, forests or wildlife, and experience of at least 12 years.
- The member secretary too will be appointed by the Centre.
- The three expert members will be one each from the fields of the environment, forests and wildlife with experience of at least 20 years.



- They will also be nominated by the Centre for a tenure of three years.

Q55 ANSWER (d)

Explanation:

**Context:**

**The Reserve Bank of India (RBI) Governor has called upon fintech entities to establish Self-Regulatory Organizations (SROs).**

**What are Self-Regulatory Organizations (SROs)?**

- **SRO is a non-governmental organization that sets and enforces rules and standards relating to the conduct of entities in the industry (members) with the aim of protecting the customer and promoting ethics, equality and professionalism. Statement 1 is incorrect.**
- SROs typically collaborate with all stakeholders in framing rules and regulations.
- Their self-regulatory processes are administered through impartial mechanisms such that members operate in a disciplined environment and accept penal actions by the SRO.
- **Regulations by SRO supplement but do not replace applicable laws or regulations. Statement 2 is incorrect.**

**What is the need for an SRO?**

**Firstly**, SROs could play a pivotal role in the fintech industry by promoting responsible practices and maintaining ethical standards.

- There have been many instances where a few fintech players were involved in unethical practices such as charging exorbitant higher interest rates and harassment of borrowers for recovering loans.

**Secondly**, by proactively addressing issues like market integrity, conduct, data privacy, cybersecurity, and risk management, SROs can help build trust among consumers, investors and regulators.

**What are the functions of SRO?**

- **Communication:** Acting as a link between members and regulatory bodies like the RBI.
- **Standards:** Setting industry benchmarks and promoting professional behaviour.
- **Training:** Providing training and awareness programs for members.
- **Dispute Resolution:** Establishing a uniform grievance resolution framework.

**What are the advantages of SRO?**

- **Expertise:** SROs are experts in their industries, providing valuable knowledge and insights to their members.
- **Ethical Standards:** They enforce ethical standards among their members, fostering trust in the industry.



- **Oversight:** SROs act as watchdogs, preventing unprofessional practices.

Q56 ANSWER (a)

Explanation:



Q57 ANSWER (b)

Explanation:

**About Sovereign Gold Bond (SGB) Scheme:**

- SGBs were introduced by the Government of India in 2015 under the Gold Monetization Scheme. Statement 1 is correct.
- SGBs are government securities issued by the RBI on behalf of the Government of India.
- They are substitutes for holding physical gold.

**Features:**

- SGBs are denominated in grams of gold with a basic unit of 1 gram.
- Investors have to pay the issue price in cash, and the bonds will be redeemed in cash on maturity.
- Eligible Subscribers: The Bonds will be restricted for sale to resident Indian entities, including individuals (in his capacity as an individual, or on behalf of minor child, or jointly with any other individual), HUFs, Trusts, Universities and Charitable Institutions.
- Tenor: The tenor of the Bond will be for a period of 8 years with an exit option in 5th, 6th and 7th year, to be exercised on the interest payment dates.

**Investment Limit:**



- Minimum: 1 gram of gold.
- Maximum: 4 KG for individuals, 4 Kg for HUF and 20 Kg for trusts.

Interest: 2.5% per annum, paid on a half-yearly basis.

**The interest on Gold Bonds shall be taxable as per the provisions of the Income Tax Act, 1961. Statement 2 is correct.**

**SGBs can be used as collateral for loans. Statement 3 is incorrect.**

Q58 ANSWER (c)

Explanation:

**Context:**

**Recently, Prime Minister of India announced the launch of the Global Biofuels Alliance.**

- **It is an India-led Initiative to develop an alliance of Governments, International organizations and Industry to facilitate adoption of biofuels. Statement 1 is correct.**
- A total of 19 countries and 12 international organizations have so far agreed to join the alliance, including both G20 members and non-member countries.
- **India, Brazil and the US are the founding members of the alliance. Statement 2 is correct.**
- **This Alliance will be aimed at facilitating cooperation and intensifying the use of sustainable biofuels, including in the transportation sector.**

**Significance of the alliance**

- It will place emphasis on strengthening markets, facilitating global biofuels trade, development of concrete policy lesson-sharing and provision of technical support for national biofuels programs worldwide.
- It will support worldwide development and deployment of sustainable biofuels by offering capacity-building exercises across the value chain, technical support for national programs and promoting policy lessons-sharing.
- It will facilitate mobilizing a virtual marketplace to assist industries, countries, ecosystem players and key stakeholders in mapping demand and supply, as well as connecting technology providers to end users.
- It will also facilitate development, adoption and implementation of internationally recognized standards, codes, sustainability principles and regulations to incentivize biofuels adoption and trade.

Q59 ANSWER (d)

Explanation:

**About India-Middle East-Europe Economic corridor:**



- **The project includes India, the UAE, Saudi Arabia, the European Union, France, Italy, Germany and the US. Statement 1 is correct.**
- The project will aim to enable greater trade among the involved countries, including energy products.
- **The IMEC comprises an Eastern Corridor connecting India to the Gulf region and a Northern Corridor connecting the Gulf region to Europe.**
- **It will include a railway and ship-rail transit network and road transport routes. Statement 2 is correct.**
- The corridor will include a rail link as well as an electricity cable, a hydrogen pipeline and a high-speed data cable.
- In the coming times, it will be a major medium of economic integration between India, West Asia and Europe.
- **The rail and shipping corridor is part of the Partnership for Global Infrastructure Investment (PGII). Statement 3 is correct.**

#### **Significance**

- It would increase prosperity among the countries involved through an increased flow of energy and digital communications.
- The project would help deal with the lack of infrastructure needed for growth in lower- and middle-income nations.

#### **Key facts about the PGII**

- It is a collaborative effort by G7 nations to fund infrastructure projects in developing nations.
- It is a developmental initiative aimed at narrowing the infrastructure gap in developing countries as well as help towards accelerating progress on SDGs globally.
- The infrastructure plan was first announced in June 2021 during the G7 Summit in the UK.
- Collectively it aims to mobilise nearly \$600 billion from the G7 by 2027 to invest in critical infrastructure that improves lives and delivers real gains for all of our people.”

#### **Q60 ANSWER (c)**

Explanation:

#### **About WTO Dispute Settlement Mechanism:**

- The Dispute Settlement Understanding (DSU) is the main WTO agreement on settling disputes.
- **The General Council of WTO convenes as the Dispute Settlement Body (DSB) to deal with disputes between WTO members. Statement 1 is correct.**

#### **The DSB has authority to:**

- establish dispute settlement panels;
- refer matters to arbitration, adopt panel, Appellate Body and arbitration reports;



- **maintain surveillance over the implementation of recommendations and rulings contained in such reports; Statement 2 is correct.**
- authorize suspension of concessions in the event of non-compliance with those recommendations and rulings;

**Process:**

- Ideally disputes are resolved through negotiations.
- If this is not possible, WTO Members can request the establishment of a panel to settle the dispute.
- The panel will issue a report, which can subsequently be appealed before the WTO's Appellate Body on questions of law.

**The Appellate Body:**

- **Appeals are handled by the permanent seven-member Appellate Body which is set up by the DSB and broadly represents the range of WTO membership. It hears appeals from reports issued by panels in disputes brought by WTO members. Statement 3 is correct.**
- The Appellate Body can uphold, modify or reverse the legal findings and conclusions of a panel.
- If a WTO member does not comply with recommendations from dispute settlement, then trade compensation or sanctions, for example in the form of increases in customs duties, may follow.

**Q61 ANSWER (c)**

**Explanation:**

**About Grand Ethiopian Renaissance Dam (GERD):**

**Location:**

- **The GERD, formerly known as the Millennium Dam, is situated in the Benishangul-Gumuz region of Ethiopia, near the border with Sudan.**
- **It is located on the Blue Nile, one of the main tributaries of the Nile River.**
- Capacity: At 6.45 Gigawatts, the dam will be the largest hydroelectric power plant in Africa when completed.

**Features:**

- It is a roller-compacted concrete (RCC) gravity-type dam comprising of two power stations, three spillways and a saddle dam.
- The main dam is 145m high and 1,780m long.
- It will create a reservoir covering 1,875 square kilometres and contain 74 billion cubic metres of water.
- **Dispute: Egypt and Sudan fear the massive \$4.2bn GERD will severely reduce the share of Nile water they receive and have repeatedly asked Ethiopia to stop filling it until they have all reached agreement on how it should work.**



Q62 ANSWER (d)

Explanation:

**Context:**

**The Phanigiri artefacts belonging to 200 BCE-400 CE and discovered in 1942, are on display at New York Metropolitan Museum of Art.**

- The Phanigiri Buddhist site is considered one of the most important finds in Buddhist iconography in this millennium.
- **Phanigiri (meaning hillock of snake hood) is a small village in the state of Telangana.**

**Key findings**

- The thoranas discovered at Phanigiri are very important as they are among the first found south of Sanchi.
- The same thorana has a panel that shows both Mahayana and Hinayana school of thought.
- There is evidence from Phanigiri that shows the deification of Buddha, and we can date this change. From a historical and spiritual identity there is a transition to canonisation and ritual.
- The monograph of the event has the image of the Buddha, wearing what looks like a Roman toga with folds, carved in limestone.

Q63 ANSWER (b)

Explanation:

**Gene Drive Technology is primarily developed to control the spread of infectious diseases such as malaria, dengue fever, and Zika virus.**

**It works by manipulating the genes of organisms like mosquitoes to disrupt their ability to transmit diseases, potentially leading to the suppression or eradication of these diseases in targeted populations.**



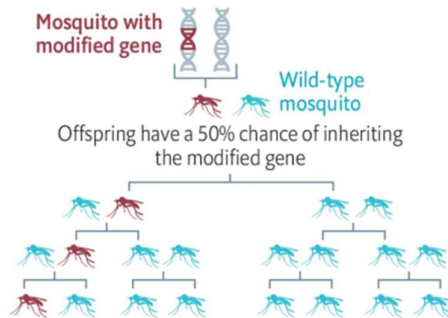
## The Gene Drive Technology

### Drive-by killing

How gene drives can quickly change whole populations

#### Normal genetic modification

A gene added to only one chromosome gets into half of offspring

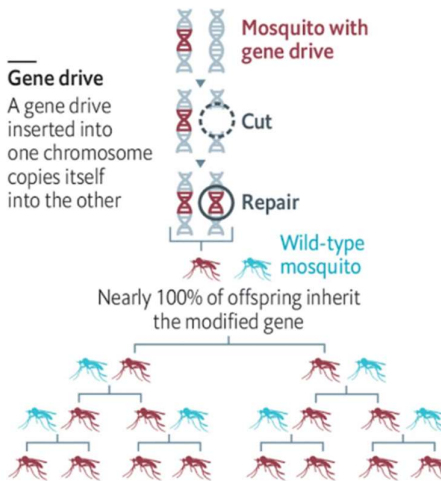


Source: Nature

The Economist

#### Gene drive

A gene drive inserted into one chromosome copies itself into the other



Q64 ANSWER (d)

Explanation:

**Context:**

**Himachal Pradesh government is taking steps to legalize cannabis (hemp) cultivation in the State.**

**What is Hemp?**

- Hemp is a botanical class of Cannabis sativa cultivars grown specifically for industrial or medicinal use.
- It is produced in parts of Himachal Pradesh though it is illegal under the Narcotic Drugs and Psychotropic Substances (NDPS) Act, 1985.

**What does the NDPS act say on Cannabis Cultivation?**

- Narcotic Drugs and Psychotropic Substances Act, 1985 prohibits the sale and production of cannabis resin and flowers.
- But Section 10 of the Act empowers the States to make rules regarding the cultivation of any cannabis plant, production, possession, transport, consumption, use and purchase and sale, and consumption of cannabis (except charas). Statement 1 is correct.
- The States are empowered to permit, by general or special order, the cultivation of hemp only for obtaining fibre or seeds or for horticultural purposes. Statement 2 is correct.
- In 2017, Uttarakhand became the first State in the country to legalize cannabis cultivation. Statement 3 is correct.



Q65 ANSWER (b)

Explanation:

**About International Tribunal for the Law of the Sea**

- **It is an independent judicial body established by the 1982 United Nations Convention on the Law of the Sea. Statement 1 is correct.**

**Composition**

- The Tribunal is composed of 21 independent members.
- Members elected by secret ballot by the States Parties to the Convention.
- Each State Party may nominate up to two candidates.

**Jurisdiction**

- It has jurisdiction over any dispute concerning the interpretation or application of the Convention, and over all matters specifically provided for in any other agreement which confers jurisdiction on the Tribunal.
- Disputes relating to the Convention may concern the delimitation of maritime zones, navigation, conservation and management of the living resources of the sea, protection and preservation of the marine environment and marine scientific research.
- **The Tribunal is open to States Parties to the Convention (i.e. States and international organisations which are parties to the Convention).**
- **It is also open to entities other than States Parties, i.e., States or intergovernmental organisations which are not parties to the Convention, and to state enterprises and private entities. Statement 2 is incorrect.**
- **The seat of the Tribunal is in the City of Hamburg, Germany. Statement 3 is correct.**

Q66 ANSWER (b)

Explanation:





Q67 ANSWER (a)

Explanation:

#### About FAO Food Price Index

- The Food and Agriculture Organization's (FAO) food price index is a measure of the monthly change in international prices of a basket of food commodities. Statement 1 is incorrect.
- It consists of the average of five commodity group price indices (cereal, vegetable, dairy, meat and sugar), weighted with the average export shares. Statement 2 is correct.
- Base year: 2014-16. Statement 3 is correct.

#### Key facts about FAO

- It is a specialized agency of the United Nations that leads international efforts to defeat hunger and improve nutrition and food security.
- Its goal is to achieve food security for all and make sure that people have regular access to enough high-quality food to lead active, healthy lives.
- Head Quarter: Rome (Italy).
- Member countries: With 195 members - 194 countries and the European Union, FAO works in over 130 countries worldwide.
- Its sister bodies are the World Food Programme (WFP) and the International Fund for Agricultural Development (IFAD).



- Reports published by the FAO: The State of the World's Forests (SOFO), The State of World Fisheries and Aquaculture (SOFIA), The State of Agricultural Commodity Markets (SOCO), The State of Food Security and Nutrition in the World (SOFI).

Q68 ANSWER (a)

Explanation:

**Context:**

**The RBI is likely to launch the pilot of central bank digital currency (CBDC) for transactions for interbank borrowing or call money market.**

**About Interbank Call Money Market:**

- **It is a short-term money market which allows for large financial institutions to borrow and lend money at interbank rates, the rate of interest that banks charge when they borrow funds from each other.**
- **The loans in the call money market are very short, usually lasting no longer than a week. Statement 1 is correct.**
- These loans are often used to help banks meet reserve requirements.
- **It is not exclusively used by banks. Interbank call money market customers can include other financial institutions, mutual funds, large corporations, and insurance companies. Statement 2 is incorrect.**

**What is Money Market?**

- **Money market basically refers to a section of the financial market where financial instruments with high liquidity and short-term maturities are traded.**
- It includes buying and selling of securities of short-term maturities, of one year or less, such as treasury bills and commercial papers.
- **It is used by many participants, including companies, to raise funds.**
- Money market is considered a safe place to invest due to the high liquidity of securities.

**What is Call Money?**

- **Call money is also referred to as the money at call.**
- **It is a short-term loan which is due to be paid immediately in full as and when demanded by the lender.**
- Not similar to a term loan, call money loan does not have a defined schedule of payment and maturity.
- Furthermore, the lender of the call money need not provide prior notice to the borrower about the repayment.

Q69 ANSWER (d)

Explanation:

**Context:**



**The President of India will inaugurate the first ‘Global Symposium on Farmers’ Rights’ (GSFR) at the ICAR Convention Centre, National Agricultural Science Centre Complex in New Delhi.**

**What is the Global Symposium on Farmers’ Rights’(GSFR)?**

- **India is hosting the first 'Global Symposium on Farmers' Rights' (GSFR) at the ICAR Convention Centre, National Agricultural Science Centre in New Delhi from September 12 to 15, 2023. Statement 1 is correct.**
- **Organized by: Secretariat of the International Treaty on Plant Genetic Resources for Food and Agriculture (International Treaty) of the Food and Agriculture Organization (FAO), Rome. Statement 2 is correct.**
- Hosted by: Ministry of Agriculture and Farmers Welfare in collaboration with Protection of Plant Varieties and Farmers’ Rights (PPVFR) Authority, Indian Council of Agricultural Research (ICAR) among others.
- Aim: To contribute to the understanding of the challenges and opportunities of implementing farmers’ rights by the signatory countries and other stakeholders.
- **Note: India has been the first country in the world to include Farmers’ Rights in the context of Plant Variety Registration through its Protection of Plant Varieties and Farmers’ Rights (PPVFR) Act, 2001.**

Q70 ANSWER (a)

Explanation:

**Context:**

**Recently, the European Commission has designated six technology giants – Alphabet, Amazon, Apple, ByteDance, Meta, and Microsoft – as gatekeepers under the Digital Markets Act (DMA).**

- **It is a groundbreaking European law aiming to prevent large online platforms that connect consumers with content, goods, and services from abusing their market power.**
- The European Commission believes that keeping the big internet companies in check can lead to more competition and choice, greater innovation, better quality, and lower prices.

**Key Measures**

- Tighter restrictions on how digital gatekeepers can use people’s data—users must give their explicit consent for their activities to be tracked for advertising purposes.
- Messaging services and social media platforms teaming up and sharing users. This could mean, for example, Meta-owned WhatsApp users being able to send messages directly to a completely different messaging service, such as Telegram.
- Presenting users with the option to uninstall preloaded applications on devices.



- Gatekeepers are banned from ranking their own products or services higher than others in online searches.
- According to the rules, any service offered by the company that meets two criteria are gatekeeper designated. These are:
- They have a market value of at least EUR 75 billion (approximately \$82 billion), and
- Either own a social platform or app that is used by at least 45 million people every month or have at least 10,000 active business users.
- The bulk of the DMA will become enforceable during 2023.

Q71 ANSWER (d)

Explanation:

**Context:**

**Indian shipping Minister recently said India and Russia seek to begin operations on the Eastern Maritime Corridor (EMC).**

**About Eastern Maritime Corridor (EMC)**

- **The EMC is a proposed sea route between the Indian port of Chennai and the Russian port of Vladivostok.**
- **The corridor is estimated to bring down transportation time between Indian and Russian ports of the Far East Region by up to 40 per cent (24 days from the current 40 days).**
- Present trade route between Mumbai in India and St. Petersburg in Russia covers a distance of 8,675 nautical miles.
- The EMC will cover a distance of about 5,600 nautical miles, which is significantly shorter than the current route via the Suez Canal.
- Once complete, EMC will take 24 days, down from presently over 40 days, to transport goods from India to Far East Russia.
- **For India, it will provide a shorter and more efficient route to access the markets of the Far East, such as China and Japan.**

Q72 ANSWER (c)

Explanation:

**Context:**

**Recently, NASA's Lucy spacecraft has captured its first images of the main belt asteroid Dinkinesh, marking the beginning of a 12-year voyage.**

**Lucy Mission**

- It was launched by NASA from the Cape Canaveral Space Force Station in Florida in 2021.



- It is a 12-year mission which will take close observations of nine of Jupiter's Trojans and two main belt asteroids along with that.
- It is the first spacecraft sent to study the Trojan asteroids, which orbit the Sun in the same path that the planet Jupiter takes.
- It has recently captured the images of Eurybates, Polymele, Leucus and Orus asteroids.

#### **About Dinkinesh asteroid:**

- It was discovered in 1999 by the LINEAR survey.
- Dinkinesh is a slow rotator with moderately large light-curve amplitude.
- It is an S-type asteroid means it is composed mainly of silicates and some metal.
- It will be the first fly-by target of the Lucy mission on 2023 November 1, during its cruise to the Trojan clouds.
- The observations were made by Lucy's high-resolution camera, the Lucy Long Range Reconnaissance Imager ( L'LORRI instrument ).

#### **Q73 ANSWER (c)**

Explanation:

#### **Context:**

Recently, Indian overnight index swap (OIS) rates rose to their highest levels in 10 months due to offshore paying and triggering of stop losses.

#### **About Overnight Index Swap:**

- It is a derivative instrument where returns under a fixed rate asset are swapped against a pre-determined published index of a daily overnight reference rate for an agreed period of time. Statement 1 is correct.
- The primary purpose of an OIS is to manage interest rate risk, particularly the risk associated with fluctuations in the overnight lending rate. Statement 2 is correct.
- An overnight index swap rate is calculated each day.
- This rate is based on the average interest rate institutions with loans based on the overnight rate have paid for that day.

#### **How does an OIS work?**

- These are instruments that allow financial institutions to swap the interest rates they are paying without having to refinance or change the terms of their existing loan.
- When two financial institutions create an overnight index swap, one of the institutions is swapping an overnight (floating) interest rate and the other institution is swapping a fixed short-term interest rate.
- To get the swap rolling, both the firms would agree to continue servicing their loans, but at the end of a specified time period whoever ends up paying less interest will make up the difference to the other firm.



Q74 ANSWER (c)

Explanation:

**Context:**

**The epicentre of the recent devastating earthquake in Morocco was in the High Atlas Mountains, about 71 km southwest of Marrakesh.**

**About High Atlas Mountains**

- The High Atlas Mountains, often referred to simply as the High Atlas, is a prominent mountain range in North Africa, primarily located in Morocco.

**Location:**

- **The High Atlas Mountains are part of the Atlas Mountain range, which stretches across Morocco, Algeria, and Tunisia.**
- It extends north-eastward for 1000km from the Atlantic Coast to the Moroccan-Algerian border.

**Geography:**

- **They are characterized by their rugged and steep terrain.**
- They are known for their **high peaks, deep valleys, and extensive plateaus.**
- The range includes several peaks over 4,000 meters (13,000 feet) in elevation, with Mount Toubkal being the highest at approximately 4,167 meters (13,671 feet).

**Cultural Significance:** They have cultural significance in Morocco. The region is inhabited by Berber communities, and traditional Berber villages can be found throughout the mountains.

**Climate Divide:** Its saw-toothed Jurassic peaks act as a weather barrier between the mild, Mediterranean climate to the north and the encroaching Sahara to the south.

Q75 ANSWER (b)

Explanation:

**Context:**

**India and Saudi Arabia recently agreed to speed up the implementation of the \$50 billion West Coast refinery project.**

**About West Coast Refinery Project**

- **First conceptualized in 2014, the West Coast refinery project, also known as the Ratnagiri Refinery and Petrochemicals Ltd (RRPCL), was envisioned as India's largest greenfield refinery with a capacity of 60 million tonnes per annum, and is touted to become the largest integrated refinery and petrochemical facility in the world.**



- **Location:** As the name implies, the project is supposed to be set up on India's western coast, specifically in Ratnagiri, Maharashtra.
- The refinery is expected to produce around 1.2 million barrels of oil a day when completed alongside the various petroleum products that will be produced by attached petrochemical plants.
- Three of India's leading government-owned public sector undertakings in the oil and gas sector came together in a joint venture partnership called RRPCL.
- RRPCL is a 50:25:25 joint venture formed in 2017 by India's three national oil companies, Indian Oil Corporation Limited (IOCL), Bharat Petroleum Corporation Limited (BPCL), and Hindustan Petroleum Corporation Limited (HPCL).
- **In 2019, Saudi Aramco and the Abu Dhabi National Oil Company (ADNOC) decided to get involved as well, collectively acquiring a 50 per cent stake in the project which is estimated to be worth around Rs 3 lakh crore purely in set-up costs.**

Q76 ANSWER (b)

Explanation:

- **Longpi Pottery:** Named after the village of Longpi in Manipur, the Tangkhul Naga tribes practice this exceptional pottery style. **Pair 1 is incorrect.**
- **Unlike most pottery, Longpi does not resort to the potter's wheel. All shaping is done with the hand and with the help of moulds.**
- The characteristic gray- black cooking pots, the stout kettles, quaint bowls, mugs and nut trays, at times with a handle of fine cane are trademarks of Longpi but now fresh design elements are being introduced both to extend the product range as well as to embellish the existing pottery.
- ✓ **Chhattisgarh Wind Flutes:** Curated by the Gond Tribe of Bastar in Chhattisgarh, the 'Sulur' bamboo wind flute stands out as a unique musical creation. **Pair 2 is correct.**
- ✓ Unlike traditional flutes, it produces melodies through a simple one-handed twirl. Craftsmanship involves meticulous bamboo selection, hole drilling, and surface etching with fish emblems, geometric lines, and triangles.
- ✓ Beyond music, the 'Sulur' serves utilitarian purposes, helping tribal men ward off animals and guide cattle through jungles. It's a harmonious blend of artistry and functionality, showcasing the Gond Tribe's ingenious craftsmanship.

**Rajasthan Artistry Unveiled: Mosaic Lamps, Ambabari Metalwork, and Meenakari Crafts**

- **Meenakari is an art of decorating metal surfaces with vibrant mineral substances, a technique introduced by the Mughals. This Rajasthan tradition demands exceptional skill.** Delicate designs are etched onto metal, creating grooves for colors to nestle in. Each hue is fired individually, creating intricate, enamel-adorned pieces. **Pair 3 is correct.**



- **Metal Ambabari Craft** curated by the Meena Tribe, also embraces enameling, a meticulous process that elevates metal decoration. Today, it extends beyond gold to metals like silver and copper. Each piece reflects Rajasthan's rich cultural legacy and craftsmanship. Pair 4 is incorrect.

Q77 ANSWER (d)

Explanation:

**Context:**

**Devastating floods occurred in Derna, Libya due to the collision of Dams and flash floods caused by a Mediterranean storm named Daniel.**

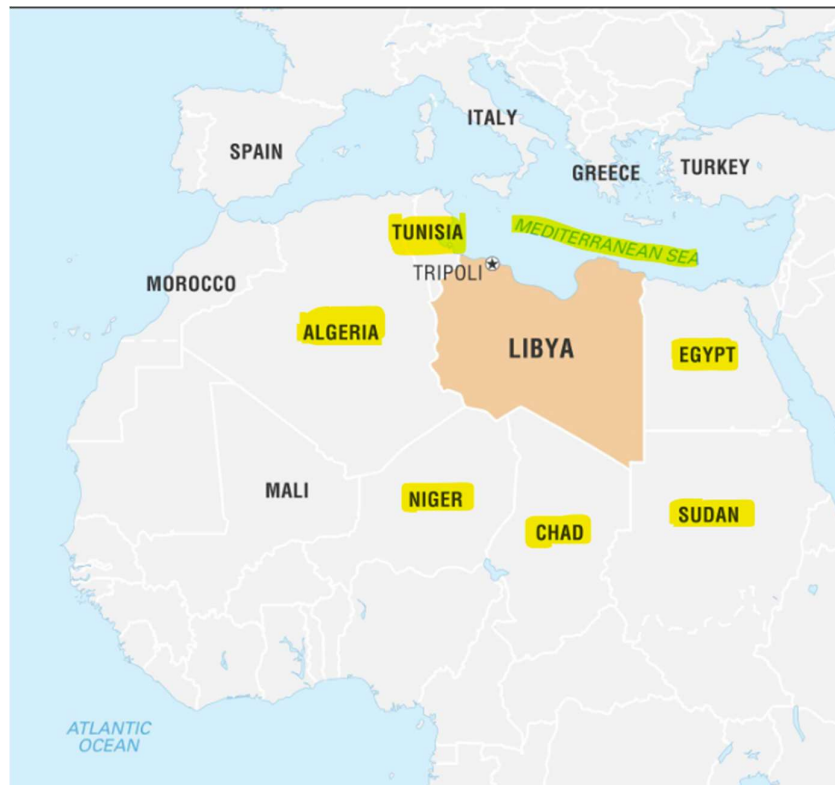
**About Derna**

- Derna (Darnah) is a port city in eastern Libya.
- The city is bisected by the Wadi Derna, a seasonal river that flows from highlands to the south, and normally protected from flooding by dams.
- The city was once a hub for extremist groups in the years of chaos that followed the NATO.

**Key Facts: Libya**

- **Capital:** Tripoli
- **Geographical Boundaries:** It is a country in the Maghreb region in North Africa.
- **North:** Mediterranean Sea
- **East:** Egypt
- **Southeast:** Sudan
- **South:** Chad
- **Southwest:** Niger
- **West:** Algeria
- **Northwest:** Tunisia





Q78 ANSWER (c)

Explanation:

- **Sovereign wealth fund – It is a state-owned investment fund comprised of money generated by the government, often derived from a country's surplus reserves. Statement 1 is correct.**
- An SWF is used to invest in capital assets such as real estate, metals, stocks, and bonds.
- **SWFs also invest in alternative investments such as private equity funds and hedge funds. Statement 2 is correct.**
- The main objective of the SWFs is to allocate funds for the betterment of the country's economy.
- **India's SWF - The National Infrastructure and Investment Fund (NIIF) is India's first-ever sovereign wealth fund (SWF). Statement 3 is correct.**

The funding for a SWF can come from a variety of sources.

Sources:

- **Balance of payments surpluses**
- **Official foreign currency operations**
- **The proceeds of privatizations**
- **Governmental transfer payments**
- **Fiscal surpluses**
- **Receipts resulting from resource exports**



**Recent trends – The total assets of 6 of the top 10 SWFs investing into Indian equities rose by more than 50% in the year to June.**

- The Singapore government was the largest SWF followed by Norway's Norges and Kuwait Investment Authority.
- Investment from Abu Dhabi Investment Authority rose to 400%, the most in percentage terms among the top 10 SWFs.
- India has also overtaken China as the most attractive emerging market for investing in emerging market debt.
- Saudi Arabia is now considering setting up an office for its SWF at GIFT City in Gandhinagar.

**Reasons - Since 2020, SWFs have been granted tax exemptions under the Indian tax laws when they invest in specified infrastructure companies directly.**

**Such exemption has also been extended to investments in units of Invits and AIFs which invest in infrastructure companies.**

**The exemption has not only increased the net return in the hands of SWFs, but has also acted as a catalyst for increasing SWF investments in the infra sector.**

Q 79 ANSWER (b)

Explanation:

**Context:**

**The Indian Army unveiled the Multi-Utility Legged Equipment (MULE) at the North Tech Symposium 2023 held recently in Jammu.**

**About Multi-Utility Legged Equipment (MULE):**

- **It is an autonomous load-bearing robot developed for the Indian Army.**
- **It has been manufactured for human-less intervention to locate and eliminate terrorists.**

**Features:**

- **It is embodied with 360-degree cameras and radars that would help the operator to detect any threat and use the firing platform to shoot it down.**
- It is an analog-faced machine, built with four legs and with a payload capacity of 12 kg.
- The equipment can be either operated on Wi-Fi or Long-Term Evolution (LTE), making it workable for distances up to 10 km from the location.
- It is controlled by an easy-to-operate remoter control.
- A firing platform can also be integrated into it.
- It is capable of taking up projects with pre-fed missions and is viable to be used in all terrains; it can be easily operated in snows and mountains as well.
- It can climb mountains hassle-free at upto 45 degrees and climb steps as high as 18 cm.



Q80 ANSWER (d)

Explanation:

**Context:**

**The Ministry of Skill Development recently launched the Skill India Digital (SID) platform.**

**About Skill India Digital (SID) Platform:**

- **SID serves as India's Digital Public Infrastructure (DPI) for the skill development, education, employment and entrepreneurship ecosystem.**
- SID Platform aims to bring all skilling initiatives under a single umbrella and provide skill development and entrepreneurial support to people.
- **Built by the National Skill Development Corporation (NSDC) in collaboration with multiple industry players, the platform is part of the World Bank-assisted Skill Acquisition and Knowledge Awareness for Livelihood Promotion (SANKALP) programme. Statements 1 and 2 are correct.**
- The platform aligns with the vision articulated in the G20 framework for building Digital Public Infrastructure (DPI) and the digital economy.

**Features:**

- More than 264 skilling courses from 42,623 centres across the country will be available under the platform.
- SID Platform application can be downloaded on the App Store and Google Play Store.
- It supports multiple Indian languages for inclusivity and uses Aadhaar-based eKYC for secure access.
- It is committed to being user-friendly, with an easy-to-use interface adaptable to various devices for accessibility.
- **The platform incorporates Aadhar-enabled facial recognition technology as well as artificial intelligence and machine learning algorithms to recommend customised courses to students. Statement 3 is correct.**
- The platform also integrates government training programmes from both Central and State governments, creating a unified hub for skill development initiatives.
- **It has introduced Digitally Verified Credentials (DVCs), a secure and tamper-proof way to showcase skills and qualifications. Users can confidently present their qualifications in a digital format that is inherently authentic. Statement 4 is correct.**
- Additionally, SID offers Digital CVs through personalized QR Codes for easy access to an individual's skills and experiences.

Q81 ANSWER (a)

Explanation:



About Cirrus Clouds:

- **They are delicate, feathery clouds that are made mostly of ice crystals.**
- They are thin and wispy in appearance, often appearing as delicate, high-altitude filaments or strands.
- **Their wispy shape comes from wind currents, which twist and spread the ice crystals into strands.**
- They are usually white or have a light Gray colour. In the daytime, they are whiter than any other cloud in the sky.
- **They are commonly known as "mare's tails" because they are shaped like the tail of a horse.**
- **Typically found at heights greater than 20,000 feet (6,000 meters), cirrus clouds are composed of ice crystals that originate from the freezing of supercooled water droplets.**
- They generally occur in fair weather and point in the direction of air movement at their elevation.

**Other Main Cloud Types:**

**Cumulus clouds:**

- They are puffy clouds that look like puffs of cotton with a distinct white or light gray appearance.
- They have a relatively short lifecycle. They form, grow, and dissipate relatively quickly under stable atmospheric conditions.
- Cumulus clouds that do not get very tall are indicators of fair weather. If they do grow tall, they can turn into thunderstorms.
- The bottom of cumulus clouds is fairly close to the ground.

**Stratus clouds:**

- They are low-level cloud formations that are characterized by their uniform and featureless appearance.
- They look like flat sheets of clouds.
- They typically cover the sky like a continuous, grayish or whitish blanket and are often associated with overcast or cloudy weather conditions.
- They may stay in one place for several days.
- They form at altitudes below 6,500 feet (2,000 meters) above sea level.

Q82 ANSWER (c)

Explanation:

**Context:**

**A recent study alarmed that six of nine planetary boundaries have been breached by the world because of human activities.**

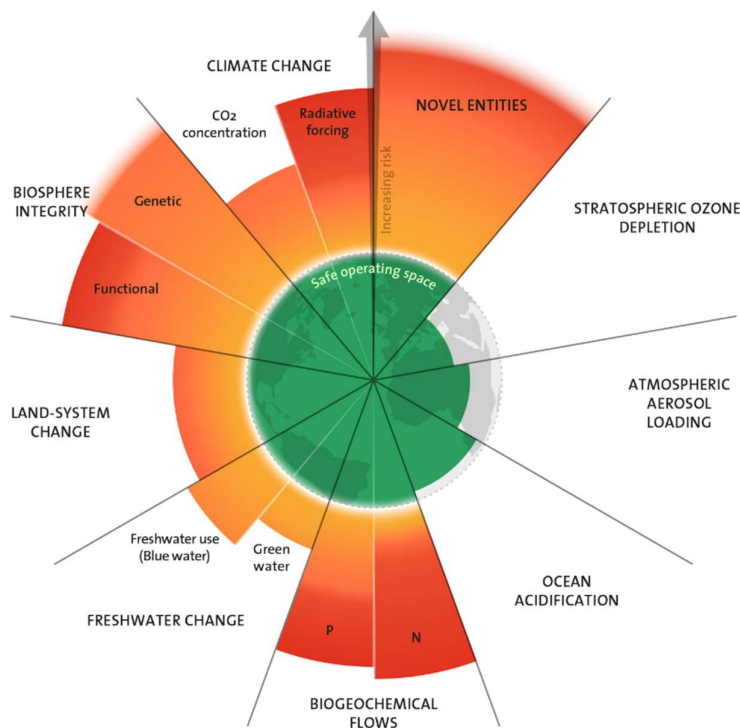
**Planetary Boundaries:**



- **The planetary boundaries concept presents a set of 9 planetary boundaries within which humanity can continue to develop and thrive for generations to come.**
- It was first proposed by former centre director Johan Rockström and a group of 28 internationally renowned scientists in 2009.

**The 6 boundaries that has been transgressed include**

1. Climate change
2. Biosphere integrity (genetic diversity and energy available to ecosystems)
3. Land system change
4. Freshwater change (changes across the entire water cycle over land)
5. Biogeochemical flows (nutrient cycles)
6. Novel entities (micro plastics, endocrine disruptors, and organic pollutants).



Q83 ANSWER (d)

Explanation:

**New Collective Quantified Goal on Climate Finance (NCQG):**

- **New Collective Quantified Goal on Climate Finance was set up under the Article 9 of the 2015 Paris Climate Agreement. Statement 2 is correct.**
- **It aims to strengthen the global response to the threat of climate change in the context of sustainable development and efforts to eradicate poverty. Statement 1 is correct.**



- It will make the finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.

**The NCQG is to be set up around the following elements:**

- Ad hoc work programme,
- Submissions by Parties and non-Party stakeholders,
- High-level ministerial dialogues and
- Stock-takes and guidance by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA).

Q84 ANSWER (b)

Explanation:

**Context:**

**The recent unprecedented weather upheavals in New England have prompted emergency services and residents to remain on high alert.**

- **Hurricane Lee along with tornadoes and catastrophic flooding has caused widespread damage and evacuations in New England in the United States. Pair 1 is correctly matched.**
- **Typhoon Khanun was a deadly storm that moved slowly up the Korean Peninsula bringing torrential rain and winds after striking southern Japan. Pair 2 is incorrectly matched**
- **The onset of the annual tropical storm season in China commenced with Typhoon ‘Talim’ which reached the shores of Zhanjiang city within Guangdong province. This event-initiated disaster preparedness measures in Hong Kong, Vietnam, and Southern China. Pair 3 is correctly matched.**

Q85 ANSWER (b)

Explanation:

About Storm Shadow Missile:

- **Storm Shadow/SCALP is a long-range cruise missile with stealth capabilities, jointly developed by the UK and France.**
- The missile is intended to strike high-valued stationary assets such as airbases, radar installations, communications hubs and port facilities.
- Able to be operated in extreme conditions, the weapon offers operators a highly flexible, deep-strike capability based on a sophisticated mission planning system.
- The Storm Shadow is also in service with the air forces of Egypt, India, Italy, Greece, Saudi Arabia, Qatar and the United Arab Emirates (UAE).

**Features:**

- It is typically launched from the air.



- It carries a 450kg conventional warhead to a range of up to 200 miles (300km).
- It is equipped with fire-and-forget technology and fully autonomous guidance.
- The missile is fitted with a passive imaging infrared seeker.
- Once launched, the missile drops to a low altitude to avoid detection by enemy radar before latching onto its target with the infrared seeker.

Q86 ANSWER (b)

Explanation:

**Context:**

**The Chennai bench of the Income Tax Appellate Tribunal (ITAT) recently ruled against Cognizant Technology Solutions India, stating that the company is liable to pay Dividend Distribution Tax (DDT) on a buyback of shares worth Rs 19,000 crore under a scheme of arrangement.**

**About Dividend Distribution Tax (DDT)**

- It was a tax imposed by the Indian government on companies that distributed dividends to their shareholders.
- It was introduced to tax the dividend income received by shareholders indirectly through the company, rather than taxing the dividend income at the individual level.
- Companies that pay dividends to their shareholders in India were required to pay the DDT.
- **DDT has been repealed and abolished by the Government for Indian corporations under the Finance Act 2020. Statement 3 is correct.**
- With this modification, Indian corporations are no longer obligated to pay DDT on dividends paid to shareholders. Instead, shareholders will be forced to pay tax on dividends based on their tax bracket.
- For example, if a shareholder is in the 30% tax bracket, the dividend received will be subject to 30% taxation.
- The dividend income is taxed in the hands of the shareholders only if dividend is distributed on or after 01-04-2020.

**What is Dividend?**

- **A dividend is a return given by a company to its shareholders out of the profits earned by the company in a particular year. Statement 1 is correct.**
- Dividends can be issued in various forms, such as cash payment, stocks or any other form.
- A company's dividend is decided by its board of directors and it requires the shareholders' approval.
- **It is not obligatory for a company to pay dividend. Many companies do not pay dividends and instead retain earnings to be invested back into the company. Statement 2 is incorrect.**

**Dividend Yield:**



- It is a measure of the annual dividend income an investor can expect to receive from an investment in a particular stock.
- It is calculated by dividing the annual dividend per share by the stock's current market price.
- This percentage helps investors assess the income potential of a stock.

Q87 ANSWER (b)

Explanation:

**Context:**

**Recently, the United Nations Development Programme (UNDP) and the National Bank for Agriculture and Rural Development (NABARD) have signed a Memorandum of Understanding (MoU) to co-create data-driven digital public good which includes DiCRA.**

- **Data in Climate Resilient Agriculture (DiCRA) is a collaborative digital public good which provides open access to key geospatial datasets pertinent to climate resilient agriculture. Statement 1 is correct.**
- **It is curated by UNDP and partner organizations to inform public investments in agriculture, already provides intelligence on climate resilience for 50 million hectares of farmland across India. Statement 2 is incorrect.**
- It is guided by the digital public good principles of open access, open software, open code and open APIs.
- It uses cutting edge data science and machine learning to identify farms that are resilient to climate change and those that are highly vulnerable.

**Advantages**

- By partnering for enhancing and scaling its use, NABARD will host and maintain the DiCRA platform and use its key geospatial datasets for policy making, research and development activities, with UNDP's technical support.
- This five-year technical cooperation is envisaged to foster collective climate action, create innovative platforms and new product offerings to enhance economic empowerment in rural India.
- Such open data innovations can highlight best practices, optimize agriculture investments and shelter populations from risk.

Q88 ANSWER (a)

Explanation:

**Context:**

**15 countries join UN convention to promote legal certainty in judicial sale of ships.**

**Beijing convention on the judicial sale of ships:**



- **Developed by - The Beijing Convention on the Judicial Sale of Ships, as it is now known, was developed by the United Nations Commission on International Trade Law (UNCITRAL). Statement 1 is correct.**
  - **Aim - It addresses the problem of new owners and those financing the purchase of vessels who, for instance, find themselves dealing with previous creditors laying claim to the ship as security for a loan.**
  - **It is an international agreement aimed at standardizing procedures for the sale of ships through judicial processes, ensuring transparency and fairness in maritime transactions. Statement 2 is correct.**
  - The UN General Assembly has called on all states wishing to strengthen the international legal framework for shipping and navigation to consider becoming a party to the convention.
- UNCITRAL is a subsidiary body of the U.N. General Assembly responsible for helping to facilitate international trade and investment.
  - IMO - The International Maritime Organisation (IMO) was supporting the establishment of the convention by acting as the repository for these notices and certificates of judicial sale.
  - GISIS - Information on pending and completed judicial sales of ships will be accessible online on IMO's Global Integrated Shipping Information System (GISIS) platform.
    - Article 21 - Article 21 of the convention provides that it will enter into force 180 days after the date of deposit of the third instrument of ratification, acceptance, approval or accession.
    - As of now, 15 States signed the Convention recently.
    - **15 countries, including China, Saudi Arabia, Singapore and Switzerland, signed the UN Convention on the International Effects of Judicial Sales of Ships and the convention is not signed by India yet. Statement 3 is incorrect.**

Q89 ANSWER (d)

Explanation:

**Context:**

**India recently reached out to Australia seeking to restock monoclonal antibody doses to combat the Nipah virus.**

**About Monoclonal Antibodies**

- Monoclonal antibodies (also called moAbs or mAbs) are proteins made in laboratories that act like proteins called antibodies in our bodies.
- Antibodies are parts of our immune system. They seek out the antigens (foreign materials) and stick to them in order to destroy them.
- The word “monoclonal” refers to the fact that the antibodies created in the laboratory are clones. **They are exact copies of one antibody.**

**Production:**



- They are produced by cloning a single type of immune cell, known as a B cell, to generate large quantities of identical antibodies. Statement II is correct.
- This process creates highly specific antibodies that target a particular antigen, which could be a virus, bacteria, cancer cell, or other disease-related molecule. Statement I is incorrect.

**Specificity:** They can be designed to recognize and bind to a particular target molecule with great precision. This specificity reduces the risk of unintended side effects.

They are used in a variety of medical applications, including the treatment of cancer, autoimmune diseases, and infectious diseases.

**Monoclonal antibodies vs. Polyclonal antibodies:**

- Monoclonal antibodies are clones of just one antibody, and they bind to one antigen only.
- Polyclonal antibodies come from several different types of immune cells and will bind to more than one antigen.

Q90 ANSWER (a)

Explanation:

**Bagmati River**

- It is a transboundary river between Nepal and India.
- **Origin:** It rises in the Shivapuri Hills to the north of Kathmandu and flows southward through the city.
- It passes across the Kathmandu Valley which is situated in Nepal.
- It gets divided from Kathmandu through Patan passing via Province No. 2 of the Southern region of Nepal that eventually seeps into the Bihar state of India.
- This river is assumed to be sacred by a pair of religions, Hindus as well as Buddhists.
- **Major tributaries** – Bishnumati, Hanumante, Dhobikhola and Tukucha.
- The river ultimately joins the Narayani River, located in southern Nepal.
- The merged waters of the Bagmati and Narayani eventually make their way southward and into the Ganges.

Q91 ANSWER (d)

Explanation:

**Context:**

India has become the 13th internationally accepted authority for issuing International Organisation of Legal Metrology (OIML) certificates. Statement 2 is correct.

**What is Legal Metrology?**



- **Legal Metrology is the application of legal requirements to measurements and measuring instruments.**
- The objective of Legal Metrology is to ensure public guarantee from the point of view of security and accuracy of the weighments and measurements.
- **The specifications for weighing and measuring instruments have been prescribed in the Legal Metrology (General) Rules, 2011.**

What is the OIML certificate?

- **An OIML certificate is issued for selling weights & measures anywhere in the world.**
- **To sell a weight or measure in the international market an OIML Pattern Approval certificate is mandatory, which will be issued by the Department of Consumer Affairs. Statement 1 is correct.**
- India follows OIML recommendations and procedures of testing and calibration of weights and measures.
- The domestic manufacturers of weighing and measuring equipment, like BP meters, oximeters and cloth scales, can now get the instruments tested in India itself before selling them in the international market.

**What is the International Organisation of Legal Metrology (OIML)?**

- **It is an intergovernmental treaty organization, established in 1955 in order to promote the global harmonization of legal metrology procedures that underpin and facilitate international trade.**
- It plays a crucial role in harmonising national laws and regulations on performance of measuring instruments like clinical thermometers, alcohol breath analysers, radar speed measuring instruments, ship tanks found at ports, and petrol dispensing units.
- **India became a member of the OIML in 1956. In the same year, India signed the metric convention with the standards of Weights and Measures Act.**
- Other Countries that can issue this certificate are Australia, Switzerland, China, Czech Republic, Germany, Denmark, France, United Kingdom, Japan, Netherlands, Sweden, and Slovakia.

Q92 ANSWER (b)

Explanation:

**Context:**

**Researchers at the University of Princeton have developed a String technique that can drastically reduce the amount of land and time needed for production.**

**Lithium Production using String Technique:**

- Lithium is a key element for new technologies and finds its use in modern batteries, ceramics, glass, grease, metallurgical powders, telecommunication and aerospace industries.



- **Current method** - A large majority of the lithium produced in the world is extracted from brine reservoirs located in salt flats which is an extremely resource intensive and time-consuming process.
- It is commercially viable only in a few locations around the world.

#### **String Technique:**

- **Working** - A set of porous fibres twisted into strings and engineered to have a water-loving (hydrophilic) core and water-repelling surface.
- When one end is dipped in a salt-water solution, the water travels up the string because of capillary action.
- The water then evaporates quickly from the string's surface which leaves behind salt ions such as sodium and lithium.
- Continued evaporation makes the salts increasingly concentrated, eventually forming sodium chloride and lithium chloride crystals.
- Sodium having low solubility, crystallises on the lower part, while the highly soluble lithium salts crystallise near the top.

#### **Significance:**

- Reduces the production time
- Reduces the land requirement by 90%
- Allows automatic recovery of lithium without the use of additional chemicals
- Allows to access new areas and new conditions like humid climates such as defunct oil and gas wells.

#### **Q93 ANSWER (a)**

#### **Explanation:**

#### **Context:**

**A hefty supply of the anorthosite soil from Sittampoondi and Kunnamalai villages ensured the Chandrayaan-3 mission's success.**

#### **Anorthosite:**

- **Anorthosite, type of intrusive igneous rock composed predominantly of calcium-rich plagioclase feldspar. Statement 1 is incorrect.**
- It contains Aluminium, Silicon and Calcium, minerals that are high in demand.
- Plagioclase – It is a member of the feldspar group (like orthoclase) and is a framework silicate.
- Plagioclase consists of a solid solution between the albite and anorthite end-members, and together with quartz is the most common of the rock forming minerals.
- **All anorthosites found on Earth consist of coarse crystals, but some samples of the rock taken from the Moon are finely crystalline. Statement 3 is correct.**
- Most anorthosites formed during Precambrian times.



- **In India, this soil is available in abundance in places like Sithampoondi and Kunnamalai villages surrounding Namakkal, and also in some areas in Andhra Pradesh and northern parts of the country. Statement 2 is incorrect.**

Q94 ANSWER (b)

Explanation:

- **The List of World Heritage in Danger is compiled by the United Nations Educational, Scientific and Cultural Organization (UNESCO) through the World Heritage Committee according to Article 11.4 of the World Heritage Convention, which was established in 1972 to designate and manage World Heritage Sites.**
- The list is intended to increase international awareness of the threats and to encourage counteractive measures.
- Threats to a site can be either proven imminent threats or potential dangers that could have adverse effects on a site.
- Armed conflict and war, earthquakes and other natural disasters, pollution, poaching, uncontrolled urbanization and unchecked tourist development pose major problems to World Heritage sites.
- Dangers can be 'ascertained', referring to specific and proven imminent threats, or 'potential', when a property is faced with threats which could have negative effects on its World Heritage values.
- **Note: No Heritage Site in India is listed in the Endangered List.**
- **Previously listed sites from India: Group of Monuments at Hampi listed from 1999–2006 and Manas Wildlife Sanctuary from 1992–2011.**
- **52 properties in 26 countries which the World Heritage Committee has decided to include on the List of World**

**Bolivia**

- **City of Potosí (2014). Pair 2 is incorrectly matched.**

**Democratic Republic of the Congo**

- Garamba National Park (1996)
- Kahuzi-Biega National Park (1997)
- **Okapi Wildlife Reserve (1997). Pair 1 is correct.**
- Virunga National Park (1994)

**Iraq**

- Ashur (Qal'at Sherqat) (2003)
- Hatra (2015)
- **Samarra Archaeological City (2007). Pair 3 is correct.**

**Uzbekistan**

- **Historic Centre of Shakhrisayabz (2016). Pair 4 is incorrect.**



Q95 ANSWER (d)

Explanation:

**Context:**

**The Indian Coast Guard Ship (ICGS) SamudraPrahari is presently deployed on an overseas mission encompassing ASEAN nations.**

**About SamudraPrahari:**

- **It is an Indian Coast Guard Ship (ICGS) specially designed for pollution control.**
- **It is the first pollution control vessel of its kind in South East Asia.**

**Features:**

- **It is equipped with the most advanced pollution Response and Control equipment for mitigating oil spills in the Exclusive Economic Zone.**
- **It has tanks and inflatable barges for storage of oil spills.**
- The ship is capable of unhindered oil recovery operations with a storage capacity of 500 KL.
- The vessel is designed to operate a twin-engine Advanced Light Helicopter and to operate and embark Chetak helicopter.
- Special features include an integrated platform management system, power management system, high power external firefighting system and one indigenous gun mount with firefighting system.
- The ship has unmanned machinery operation capability.

Q96 ANSWER (b)

Explanation:

**About Critical Raw Materials Act (CRM Act):**

- **Critical raw materials (CRMs) are raw materials of high economic importance for the EU, with a high risk of supply disruption due to their concentration of sources and lack of good, affordable substitutes.**
- **The CRM Act identifies a list of 30 critical raw materials, including lithium, cobalt, nickel, rare earths, and magnesium.**

**Objectives of the Act:**

- Increase and diversify the EU's CRMs supply;
- Strengthen circularity, including recycling;
- Support research and innovation on resource efficiency and the development of substitutes;



**Setting benchmarks by 2030 for domestic capacities: The Act sets these benchmarks along the strategic raw materials value chain and for the diversification of EU supplies**

- at least 10% of the EU's annual consumption for extraction;
- at least 40% of the EU's annual consumption for processing;
- at least 15% of the EU's annual consumption for recycling;
- no more than 65% of the EU's annual consumption from a single third country;

**The Act will reduce the administrative burden, streamlining permitting procedures for critical raw materials projects in the EU.**

To ensure supply chain resilience, the Act creates CRMs supply chain monitoring and stress-testing, coordinates strategic stocks and sets risk preparedness obligations on large companies producing strategic technologies.

In addition to a list of CRMs for the whole EU economy, it lists strategic raw materials, which are those most crucial for strategic technologies used for green, digital, defence and space applications.

Q97 ANSWER (c)

Explanation:

**Context:**

**The National Aeronautics and Space Administration's (NASA) Juno mission completed its 53rd close flyby of Jupiter and it sped past the gas giant's volcanic Moon Io and captured the stunning frame of both of them together.**

**About Juno spacecraft:**

- **JUNO is an acronym for Jupiter Near-polar Orbiter.**
- It was launched in 2011, the Juno spacecraft initially embarked on a 5-year journey to the largest planet in our solar system.
- Towards the end of its primary mission, the spacecraft's objectives evolved, and it transitioned into a full Jupiter system explorer with flybys of Jovian moons.
- **Goal: Understand the origin and evolution of Jupiter, look for a solid planetary core, map the magnetic field, measure water and ammonia in the deep atmosphere, and observe auroras.**

Q98 ANSWER (a)

Explanation:

**Context:**

**The TrailGuard AI camera-alert system installed at the Kanha-Pench corridor in Madhya Pradesh has come in handy for wildlife officials.**

**TrailGuard AI camera:**



- **These are slim devices that can be inconspicuously set up within the foliage of trees. Statement 2 is incorrect.**

#### **Features**

- It is shaped like a pen, 13.8 cm long and 1.4 cm wide, it is wired to another 'communications' unit, the size of a notepad.
- The system has embedded software that can be instructed to take pictures of specific species of interest.
- **It is incredibly small – the head of the camera, along with the passive infrared sensor, is only about the size of a person's index finger.**
- **It can be set to specifically capture humans or species of interest — lions, tigers, cheetahs. Statement 1 is correct.**
- If the camera is located at a place within the range of cellphone towers, it can send pictures within 30 seconds.
- If it is out of this range, it can rely on a longer protocol that can take from 3-10 minutes.
- The 'AI' element, or 'embedded AI' as it is technically known, in this system is that instead of transmitting every image captured, the camera only sends pictures of interest to forest officials.

**The product was developed by RESOLVE, an international non-profit organization.**

Q99 ANSWER (c)

Explanation:

**Context:**

**European Commission President Ursula von der Leyen recently visited the Italian island of Lampedusa, which is struggling with a surge in migrant arrivals.**

**About**

- Lampedusa, which is closer to North Africa than the Italian mainland, has long been targeted by people smugglers. With Tunisia now the main launching pad for Europe, the island today is receiving around 70% of all migrants arriving in Italy.





Q100 ANSWER (d)

Explanation:

#### Definition of Fugitive Economic Offender:

- A “fugitive economic offender” is an individual against whom an arrest warrant has been issued for committing an offense listed in the Act, and the value of the offense is at least Rs. 100 crores. Statement 1 is correct.
- Offenses listed in the act include counterfeiting government stamps or currency, cheque dishonour, money laundering, and transactions defrauding creditors.

#### Declaration of a FEO:

- After considering an application, a special court (designated under the Prevention of Money Laundering Act, 2002) may declare an individual as a fugitive economic offender.
- The court may confiscate properties that are proceeds of crime, benami properties, or any other property, whether in India or abroad.
- Upon confiscation, all rights and titles of the property vest in the central government, free from encumbrances.
- The central government may appoint an administrator to manage and dispose of these properties.

#### Bar on Filing or Defending Civil Claims:

- The Act allows any civil court or tribunal to prohibit a declared fugitive economic offender from filing or defending any civil claim.



- Furthermore, any company or limited liability partnership where such an individual is a majority shareholder, promoter, or a key managerial person may also be barred from filing or defending civil claims.
- Authorities may provisionally attach properties of an accused while the application is pending before the Special Court.

#### **Powers:**

- **The authorities under the Prevention of Money Laundering Act, 2002, will exercise powers conferred upon them by the Fugitive Economic Offenders Act. Statement 2 is correct.**
- These powers are akin to those of a civil court and include the search of persons in possession of records or proceeds of crime, the search of premises upon belief that a person is a fugitive economic offender, and the seizure of documents.

#### **Other laws related to FEOs**

- The existing laws under which such fugitive economic offenders are tried include:
- Recovery of Debts Due to Banks and Financial Institutions Act (RDDBFI),
- Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002, (SARFESI) and
- Insolvency and Bankruptcy Code (IBC).

#### **Q101 ANSWER (c)**

Explanation:

1. Jogalthambi	(Nashik) Maharashtra
<b>2. Devbarnak</b>	<b>(Shahabad) Bihar</b>
3. Devarashtra	(Vishakhapatnam) Andhra Pradesh
4. Pattadakal	(Bijapur) Karnataka

#### **Q102 ANSWER (c)**

Explanation:

#### **Context:**

**Recently, earth was hit by a strong Coronal Mass Ejection (CME).**

#### **About Coronal Mass Ejections (CMEs):**

- **CMEs are large expulsions of plasma and magnetic fields from the Sun's corona that propagate outward into interplanetary space. Statement 1 is correct.**
- During a CME, the Sun releases a colossal amount of material, including electrons, protons, and heavier ions, as well as magnetic fields. This ejected material travels at high speeds into space.

#### **Causes:**



- **CMEs are typically triggered by the destabilization of the Sun's magnetic fields. Statement 2 is correct.**
- The exact mechanisms are complex, but they often involve the reconfiguration or disruption of magnetic loops on the Sun's surface.
- CMEs are distinct from solar flares, although they often occur together. Solar flares are sudden and intense bursts of energy and radiation, whereas CMEs involve the expulsion of solar material.

#### **Impact on Earth:**

- **Geomagnetic Storms:** The interaction between the CME's magnetic fields and Earth's magnetosphere can lead to geomagnetic storms. These can disrupt satellite communications, navigation systems, and even power grids.
- **Auroras:** CMEs can cause spectacular displays of the Northern and Southern Lights, also known as auroras, by energizing particles in Earth's atmosphere.
- **Radiation Hazards:** Astronauts in space or passengers on high-altitude flights can be exposed to elevated levels of radiation during a CME event.

#### **Key Facts about Solar Flare:**

- A solar flare is an intense burst of radiation coming from the release of magnetic energy associated with sunspots.
- Flares are our solar system's largest explosive events.
- They are seen as bright areas on the sun, and they can last from minutes to hours.
- In a matter of just a few minutes, they heat the material to many millions of degrees and produce a burst of radiation across the electromagnetic spectrum, including from radio waves to x-rays and gamma rays.
- Although solar flares can be visible in white light, they are often more readily noticed via their bright X-ray and ultraviolet emissions.

#### **Effect of Solar Flare on Earth:**

- The intense radiation emitted during a solar flare can affect satellite communications, disrupt radio signals, and even pose a risk to astronauts in space.
- Additionally, the increased solar radiation can lead to geomagnetic storms, which may impact power grids and cause auroras (northern and southern lights) at lower latitudes.

#### **What is a Geomagnetic Storm?**

- A geomagnetic storm is a major disturbance of Earth's magnetosphere.
- These storms result from variations in the solar wind that produces significant changes in the currents, plasmas, and fields in Earth's magnetosphere.
- The solar wind conditions that are effective for creating geomagnetic storms are sustained (for several hours) periods of the high-speed solar wind and a southward-directed solar wind magnetic field (opposite the direction of Earth's field) at the dayside of the magnetosphere.
- The largest such storms are associated with solar coronal mass ejections (CMEs), where a billion tons or so of plasma from the sun, with its embedded magnetic field, arrives at Earth.



Q103 ANSWER (d)

Explanation:

**Context:**

**Ministry of Environment, Forest and Climate Change (MoEF&CC) recently celebrated the 29th World Ozone Day.**

**About World Ozone Day:**

- World Ozone Day, or International Day for the Preservation of the Ozone layer, is observed annually on September 16.
- It is celebrated every year to spread awareness among people about the depletion of the Ozone Layer and the measures taken/ to be taken to preserve it.
- **The theme for World Ozone Day 2023 is “Montreal Protocol: fixing the ozone layer and reducing climate change”.**

**History:**

- In 1994, the UN General Assembly proclaimed 16 September the International Day for the Preservation of the Ozone Layer, commemorating the date of the signing, in 1987, of the Montreal Protocol, on substances that deplete the Ozone layer.
- The protocol was signed on September 16, 1987, in Montreal, Canada, to address the depletion of the ozone layer.

**What is the Montreal Protocol?**

- **It is an international treaty that aimed to phase out the production and consumption of ozone-depleting substances, primarily chlorofluorocarbons (CFCs), halons, carbon tetrachloride, and other chemicals. Statement 1 is correct.**
- These substances were commonly used in refrigeration, air conditioning, and aerosol propellants.

**Kigali Agreement:**

- **It is an amendment to the Montreal Protocol.**
- It was adopted on October 15, 2016, in Kigali, Rwanda, as an extension of the Montreal Protocol.
- While the original Montreal Protocol focused on phasing out ozone-depleting substances, **the Kigali Amendment addresses the phase-down of Hydrofluorocarbons (HFCs), which are used as replacements for those ozone-depleting substances. Statement 2 is correct.**
- The primary goal of the Kigali Amendment is to reduce the production and consumption of HFCs, with the aim of mitigating their contribution to global warming.