R.C. Reddy IAS Study Circle

CURRENT AFFAIRS TEST SERIES- CSE PRELIMS 2024

CURRENT AFFAIRS TEST-12 - (April 2023,2024)

Key with Explanation

Q1 ANSWER (c)

Explanation:

- **The Saffir-Simpson (SS) hurricane wind scale is the most widely used metric for warning the public about the dangers of tropical cyclones introduced in 1970.**
- **The SS hurricane wind scales are categorised by the maximum sustained wind speed at a height of 10 metres.**

Categories

- 74-95 mph: Very dangerous winds will produce some damage
- 96-110 mph: Extremely dangerous winds will cause extensive damage
- 111-129 mph: Devastating damage will occur
- 130-156 mph: Catastrophic damage will occur
- 157 mph or higher: Catastrophic damage will occur

This scale does not take into account other potentially deadly hazards such as storm surge, rainfall flooding, and tornadoes.

Q2 ANSWER (d)

Explanation:

What are EC's guidelines for carrying cash during MCC?

- All movement of Indian currency or foreign exchange should be effected by the person(s) authorised who should carry the supporting documents while moving the cash. The movement should be on the basis of requisition made by the receiver and to the address of the destination.
- The poll body advised people not to carry cash of Rs 50,000 and more without supporting documents.
- Unexplained cash over Rs 50,000 will be confiscated by the authority
- Seizures over Rs 10 lakh will be referred to the Income Tax Department (IT).
- If the cash is being moved from the office/branch of the Authorised Person (AP); it should leave the place only after it has been recorded in the books of accounts of the AP.
- Similarly, if the destination point of movement of the currency is the office/branch of the AP, it should be recorded in the books of accounts of the AP, on the same day or on the date of receipt.
- Transfer of foreign currency between branches of the same AP should be accounted as stock transfer and not as sale so that double counting is avoided.

- The movement of cash should be in sync with the documents.
- **According to the Election Commission of India (ECI), any individual found carrying cash exceeding Rs 50,000 or new items worth over Rs 10,000 will be seized.** This measure has been put in place to prevent the misuse of cash for electoral influence**. Statement 1 is correct.**
- **If the individual can provide valid documents and declare that the seized items are not related to the elections, they will be returned. Statement 2 is correct.**
- **However, if the seized cash amount exceeds Rs 10 lakh, it will be forwarded to the Income Tax Department for further investigation. Statement 3 is correct.**

Q3 ANSWER (c)

Explanation:

Context:

Researchers at Northwestern University recently outlined a new strategy to fabricate high-density and mechanically flexible Organic Electrochemical Transistor (OECTs).

About Organic Electrochemical Transistor:

- **It is an emerging class of transistor based on organic superconducting materials known for their ability to modulate electrical current in response to small changes in the voltage applied to their gate electrode.**
- **It is a device capable of simultaneously controlling the flow of electronic and ionic currents. Statement 1 is correct.**
- Advantages: They have various notable advantages, including promising amplification and sensing capabilities, low power consumption, low driving voltages and a versatile structure.
- **Applications: They can be used to create biosensors, wearable devices, and neuromorphic systems. Statement 2 is correct.**

What is a transistor?

- It is a semiconductor device for amplifying, controlling, and generating electrical signals.
- It is the active components of integrated circuits, or "microchips," which often contain billions of these minuscule devices etched into their shiny surfaces.

There are three terminals for transistor as mentioned below:

1. Base: To activate the transistor
2. Collector: It is a positive lead of transistor
3. Emitter: It is a negative lead of transistor

Types of Transistors

- Bipolar Junction Transistor: It is considered one of the most common types of transistors and it can be either NPN or PNP.
    - It can able to amplify the electrical signal by joining all three layers into one. In current flow, there are two types of electrical charges involved i.e., electrons and holes.

- Field effect transistor: It is a three-terminal semiconductor device. Its operation is based on a controlled input voltage.
    - It uses an electric field to control the field of electric current in a semiconductor.
    - They are also known as unipolar transistors since they contain single-carrier-type operations.

Q4 ANSWER (b)

Explanation:

Context:

Punnett squares are a way to predict the possible genetic outcomes of the offspring when two individuals with known genotypes are crossed.

About:

- The Punnett Square is named after British geneticist Reginald Punnett.
- Along the top and side of the grid, the possible genetic traits of one parent on one side and the other parent on the other side are listed. Then these squares are filled by combining the traits from each parent.
- Each square effectively represents a possible combination of traits that their offspring could inherit. It's a simple way to visualise the probabilities of different traits showing up in the offspring.
- **A Punnett Square is a useful tool that helps predict the variations and probabilities resulting from cross-breeding.**

Q5 ANSWER (b)

Explanation:

Context:

There is only enough water to fill 23% of the holding capacity in all of South India's reservoirs, Central Water Commission data.

Central Water Commission (CWC)

- CWC was earlier known as Central Waterways, Irrigation and Navigation Commission (CWINC).
- It was established in 1945 by the Government on the advice of Dr. B.R. Ambedkar, Member in Viceroy's Executive Council.
- The organization currently functions as an office attached to the Ministry of Jal Shakti, under the Department of Water Resources, River Development, and Ganga Rejuvenation.

The work of the Commission is divided among 3 wings namely:

- Designs and Research (D&R) Wing
- River Management (RM) Wing

- Water Planning and Projects (WP&P) Wing

Role – Initiate and Coordinate the schemes introduced by the Ministry of Jal Shakti. Statement 3 is correct.

Functions –

- Technical Appraisal of Irrigation Projects.
- Management and Control of Floods.
- Checking Financial Feasibility and Economic Viability of Different Irrigation Projects.

Central Groundwater Board (CGWB)

- Central Ground Water Board (CGWB) is the National Apex Agency, a subordinate office of the Ministry of Water Resources, Government of India.
- **It is entrusted with the responsibilities of providing scientific inputs for management, exploration, monitoring, assessment, augmentation and regulation of ground water resources of the country. Statement 1 is incorrect.**
- Central Ground Water Board was established in 1970 by renaming the Exploratory Tube wells Organization under the Ministry of Agriculture, Government of India.
- It was merged with the Ground Water Wing of the Geological Survey of India during 1972.
- Central Ground Water Board is a multi-disciplinary scientific organization consisting of Hydrogeologists, Geophysicists, Chemists, Hydrologists, Hydro meteorologists and Engineers.
- Headquarters – Haryana.

Central Ground Water Authority (CGWA)

- Central Ground Water Authority has been constituted under Section 3 (3) of the Environment (Protection) Act, 1986.
- **CGWA aims to regulate and control development and management of ground water resources in the country. Statement 2 is incorrect.**

Activities –

- Macro/micro level groundwater management studies.
- Exploratory drilling programme.
- Monitoring of groundwater levels and water quality through.
- Implementation of demonstrative schemes for artificial recharge and rainwater harvesting for recharge augmentation.

Q6 ANSWER (b)

Explanation:

Context:

Recently, swell waves inundated coastal areas in central and southern districts of Kerala.

About Swell Waves

- **A swell is the formation of long wavelength waves on the surface of the seas.** These are composed of a series of surface gravity waves. **Statement 1 is correct.**

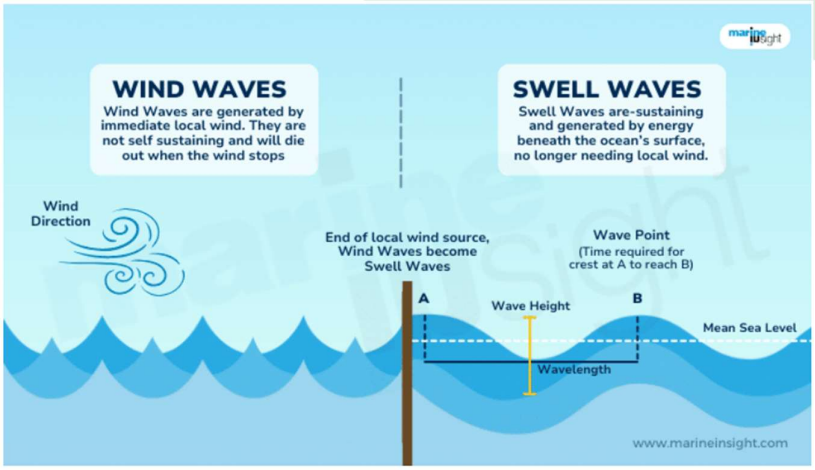
Formation:

- **They occur not due to the local winds, but rather due to distant storms like hurricanes, or even long periods of fierce gale winds. Statement 2 is incorrect.**
- During such storms, huge energy transfer takes place from the air into the water, leading to the formation of very high waves. Such waves can travel thousands of kilometres from the storm centre until they strike shore.

Features

- **Swells have a narrower range of frequencies and directions than locally generated wind waves, because swell waves have dispersed from their generation area, have dissipated and therefore lost an amount of randomness, taking on a more defined shape and direction.**
- **These waves can propagate in directions that differ from the direction of the wind, in contrast to a wind sea.**
- Their wavelengths may rarely exceed more than 150 m. Swell wavelength, also, varies from event to event. Occasionally, swells which are longer than 700 m occur as a result of the most severe storms.
- It occurs without precursors or any kind of local wind activity and as a result.

In India early warning systems like the Swell Surge Forecast System launched by the Indian National Centre for Ocean Information Services (INCOIS) in 2020. Statement 3 is correct.



Q7 ANSWER (d)

Explanation:

Context:

On Monday, the Supreme Court refused to give Kerala relief in its case against the Centre over net borrowing limits.

- **Article 293 mentions how a state can borrow money from the Consolidated Fund of India. Statement 1 is correct.**
- **The executive power of a State extends to borrowing within the territory of India upon the security of the Consolidated Fund of the State within such limits and to the giving of guarantees within such limits, if any, as may be so fixed." Statement 2 is correct.**
- **Article 293(3) of the Constitution requires states to obtain the Centre's consent to borrow if the state is indebted to the Centre over a previous loan. Statement 3 is correct.**
- In practice, the Centre has been exercising this power in accordance with the recommendations of the Finance Commission. **Every state is currently indebted to the Centre, and thus, all require the Centre's consent to borrow. Statement 4 is correct.**

Q8 ANSWER (a)

Explanation:

Context:

Recently, the International Energy Agency (IEA) launched the Clean Energy Transitions Programme annual report 2023.

Clean Energy Transitions Programme

- **It is the IEA's flagship initiative launched in 2017 for accelerating progress toward a global net zero energy system.**
- It leverages the insights and influence of the world's leading energy authority to accelerate clean energy transitions, particularly in emerging and developing economies.
- Its goals are in line with the objectives of the 2015 Paris Agreement and the Sustainable Development Goals established by the United Nations.

International Energy Agency (IEA)

- It is an autonomous inter-governmental organisation within the OECD framework.
- It works with governments and industry to shape a secure and sustainable energy future for all.
- It was founded in 1974 to ensure the security of oil supplies.
- It was created in response to the 1973-1974 oil crisis when an oil embargo by major producers pushed prices to historic levels and exposed the vulnerability of industrialised countries to dependency on oil imports.
- It consists of 31 member countries and eleven association countries.
- A candidate country to the IEA must be a member country of the Organisation for Economic Co-operation and Development (OECD).

Q9 ANSWER (c)

Explanation:

Context:

Recently, a New York-based research lab and technology company Hume, has introduced what can be called the 'first conversational AI with emotional intelligence'.

About Hume AI:

- **It is the world's first emotionally intelligent voice AI. It accepts live audio input and returns both generated audio and transcripts augmented with measures of vocal expression.**
- It is essentially an API that is powered by its proprietary empathic large language model (e-LLM). This e-LLM reportedly understands and emulates tones of voices and word emphasis to optimise human-AI conversations.
- It is trained on human reactions to optimize for positive expressions like happiness and satisfaction. EVI will continue to learn from users' reactions.
- By processing the tune, rhythm and timbre of speech, EVI unlocks a variety of new capabilities, like knowing when to speak and generating more empathic language with the right tone of voice.

Q10 ANSWER (b)

Explanation:

Context:

Over 60 products from across India earn GI tags. This is the first time such a large number of Geographical Indication (GI) Tags have been given at a go.

Sarthebari metal craft: Assam. Pair 1 is incorrect.

- Sarthebari is home to the bell metal industry, the second largest handicraft of Assam.
- Bell metal is an alloy of copper and tin and utensils made from it are used for domestic and religious purposes.

Pani Meteka craft: Assam. Pair 4 is correct.

- It is crafted from Water Hyacinth.
- Water hyacinth is a free-floating perennial aquatic plant (hydrophyte).

GI Tags from Tripura:

- Pachra-Rignai; **Matabari Peda. Pair 2 is correct.**

GI Tags from Meghalaya

- Meghalaya Garo Textile; Meghalaya Chubitchi; **Meghalaya Larnai Black Pottery. Pair 3 is incorrect.**

Q11 ANSWER (b)

Explanation:

Perennial Rivers	
West-flowing	**East-flowing**
Ghaggar- Hakra	Subarnarekha
Luni	Damodar
Sabarmati	Brahmani
Mahi	Mahanadi
Narmada	Godavari
Tapti	Krishna
Mandovi	**Pennar**
Kali	**Palar**
Sharavati	**Ponnaiyar**
Periyar	Kaveri
Pampa	Vaigai
	Thamirabarani

Q12 ANSWER (d)

Explanation:

National Information System for Climate and Environment Studies (NICES) programme

- **Aim – It envisages realisation of national level climate database generation. Statement 1 is correct.**
- The data base will be derived from Indian and other Earth Observation satellites from polar and geostationary missions for climate change impact assessment and mitigation.
- Incepted in – 2012, developed and made accessible over 70 geophysical variables related to Terrestrial, Ocean, and Atmospheric conditions.
- **Operated by - Indian Space Research Organisation (ISRO) and the Department of Space along with other ministries and institutions. Statement 2 is correct.**
- **It works under the framework of the National Action Plan on Climate Change to invite Indian researchers to join in combating climate change. Statement 3 is correct.**

Q13 ANSWER (d)

Explanation:

Context:

Natural gas has been called a 'bridge fuel' for countries looking to transition away from coal and oil dependency, and as they pursue a pathway towards renewables and electrification.

About Bridge Fuel

- **Bridge fuel is a commonly-used term for a fuel that will power society with the least environmental cost while we deploy non-polluting, renewable energy.**
- **The goal of using a bridge fuel is to replace the bulk of today's fossil-fuel-dependent energy sources as we transition to a cleaner and more renewable energy economy that is free of greenhouse gas emissions.**
- The length of the bridge and the energy source used to build the bridge are both topics of debate.
- Many people consider natural gas a bridge fuel because it produces less greenhouse gas during the combustion process.
- However, additional considerations for a bridge fuel include whether it increases national energy independence while reducing pollution-related costs.

Key Facts about Natural Gas:

- Natural gas is a fossil fuel. Like all fossil fuels, it is a non-renewable resource.
- It is a mixture of gases which are rich in hydrocarbons.
- It is a colourless and odourless gas composed of 70-90% methane (CH4). Its other ingredients include ethane (C2 H6) and propane (C3 H8).
- Possible impurities include carbon dioxide (CO2), hydrogen sulphide (H2S), and nitrogen (N).

Q14 ANSWER (c)

Explanation:

Context:

A recent study highlighted that due to factors like climate change and geological shifts, Earth's changing rotation may prompt clocks to skip a second, potentially necessitating a "negative leap second" around 2029.

About Leap Second

- **It is used as a measure to combat the long-term slowdown in the Earth's rotation which is caused by the constant melting and refreezing of ice caps.**
- **It is added every now and then to Coordinated Universal Time (UTC) in order to synchronize a clock worldwide with the Earth's ever slowing rotation.**
- The system of leap seconds was introduced in the early 1970s. **So far, 27 positive leap seconds have been added.**

- UTC consists of a time scale that combines the output of more than 300 highly precise atomic clocks worldwide. Atomic clocks are very accurate and are stable within 1 second over a period of millions of years.
- On the other hand, the Astronomical Time known as Universal Time (UT1) refers to the Earth's rotation around its own axis and determines the length of a day.
- Reason for addition: The Earth's rotation around its own axis is not regular, as sometimes it speeds up and sometimes it slows down, due to various factors including the moon's gravitational Earth-braking forces that often results in ocean tides.
- As a result, Astronomical Time (UT1) gradually falls out of synch with atomic time (UTC), and as and when the difference between UTC and UT1 approaches 0.9 seconds, a "Leap Second" is added to UTC through Atomic clocks worldwide.
- A leap second is normally inserted either on June 30 or December 31.

What is Negative Leap second?

- **It is a second that is subtracted from our clocks to keep them in sync with the Earth's rotation. Statement 1 is correct.**
- **Till date no negative leap second was introduced because, in the last few decades the Earth's rotation has generally been a bit slow. Statement 2 is correct.**
- The International Earth Rotation and Reference Systems Service (IERS) monitors the Earth's rotation, and takes decisions on when to add or subtract a leap second.
- Since Earth is spinning faster than usual recently, timekeepers had thought of using negative leap seconds for the first time.

Q15 ANSWER (b)

Explanation:

Context:

The Supreme Court recently sought responses from the Election Commission of India (ECI) and the Centre on a plea seeking a comprehensive count of Voter Verifiable Paper Audit Trail (VVPAT) slips in elections.

About Voter Verifiable Paper Audit Trail (VVPAT)

- **It was first introduced in India in the 2014 Lok Sabha elections. Statement 1 is correct.**
- It is an independent system that consists of two parts, namely, a VVPAT Printer and VVPAT Status Display Unit (VSDU) attached to the Electronic Voting Machines (EVMs), that allow the voters to verify that their votes are cast as intended.
- **When a vote is cast, a slip is printed containing the serial number, name, and symbol of the candidate and remains exposed through a transparent window for 7 seconds.**
- Thereafter, this printed slip automatically gets cut and falls into the sealed drop box of the VVPAT.

How is VVPAT used for verification?

- The results of EVMs can be verified using the slips kept in the drop boxes of VVPAT machines.
- **VVPAT can be accessed by the polling officials, but not by the voters. Statement 2 is correct.**
- The paper slips are deemed to be more authoritative than EVM tallies in cases where VVPAT slips are utilised to verify votes.
- Voter verification, however, is only done in extreme circumstances, such as when there are accusations of fraud or miscalculation.
- The ECI has the authority to request that votes be verified using VVPAT slips in response to such complaints.
- **At the moment, the VVPAT slips are counted in a randomly-selected polling station in each Assembly constituency or Parliamentary constituency, depending upon the nature of the elections being held. Statement 3 is incorrect.**

Q16 ANSWER (a)

Explanation:

Context:

Recently, police registered a zero FIR case against a former minister of Telangana for allegedly making objectionable comments against the Telangana Chief Minister.

About Zero FIR

- **It refers to a First Investigation Report (FIR) that is registered irrespective of the area where the offense is committed.**
- **The police in such a case can no longer claim that they have no jurisdiction.**
- **It is later transferred to the police station that has the actual jurisdiction so that the investigation can begin.**
- It was introduced on the recommendation of the Justice Verma Committee formed at the backdrop of the brutal Nirbhaya gang rape in Delhi in 2012.
- This puts a legal obligation on the police to begin an investigation and take quick action without the excuse of the absence of jurisdiction.
- **Objective:** It is to ensure the victim doesn't have to run from pillar to post to get a police complaint registered. The provision is meant to provide speedy redressal to the victim so that timely action can be taken after the filing of the FIR.

What is an FIR?

- It is information recorded by a police officer on duty given either by the aggrieved person or any other person to the commission of an alleged offence.
- **It is not defined in the Indian Penal Code (IPC), Code of Criminal Procedure (CrPC), 1973, or in any other law.**
- In police regulations or rules, information recorded under Section 154 of CrPC is known as First Information Report (FIR).

Q17 ANSWER: (d)

Explanation:

Context:

The Reserve Bank of India is considering establishing a Digital India Trust Agency (DIGITA) to combat cyber fraud and illegal lending apps.

About Digital India Trust Agency:

- **It will be responsible for stopping illegal lending apps from popping up. It will enable the verification of these digital lending apps and will maintain a public register of these verified applications.**
- Any app which will not carry the "verified" tag of DIGITA, will be considered unauthorised.
- **Significance: This will create an important and much-needed checkpoint in the fight against online financial fraud.**

What is digital lending?

- It is a remote and automated lending process, largely by use of seamless digital technologies. It generally involves three parties – a lender, a lending service provider (including a digital lending platform) and a borrower.
- It involves lending through web platforms or mobile apps, utilising technology in customer acquisition, credit assessment, loan approval, disbursement, recovery and associated customer service.
- It includes products like Buy Now, Pay Later (BNPL), which is a financing option (or simply a short-term loan product). It allows one to buy a product or avail a service without having to worry about paying for it immediately.

Q18 ANSWER (c)

Explanation:

Context:

Recently, a deadly tornado struck the Mainaguri area of Jalpaiguri district of West Bengal for 10 minutes and killed five people and injured over a 100.

About Tornado

- **It is a land-based vertical column of violently rotating air that forms from a thunderstorm to the ground. It can have wind speeds in the range of 105-322 kilometres per hour.**
- The rotating column is physically connected to the cloud base or wall cloud and is often visible as a cloud-filled "condensation funnel". If the air is dry enough, the tornado may only appear as a swirl of dirt on the ground without a visible connection to the cloud above.
- **The tornado over the sea is called waterspouts.**
- **Formation: Any collision of warm, moist air with dry, cool air in the presence of a low-pressure system like a trough causes thunderstorms and tornadoes. Statement 1 is correct.**

Geographical distribution:

- **It occurs most commonly on continents in the mid-latitudes (between 20 and 60 degrees north and south), where they are frequently associated with thunderstorms that develop in regions where cold polar air meets warm tropical air. Statement 2 is correct.**
- **Tornadoes are the most common in the United States, Argentina and Bangladesh. Statement 3 is correct.**

The Enhanced Fujita scale is used to measure tornado strength. It is used to assign a tornado a 'rating' based on estimated wind speeds and related damage.

Q19 ANSWER (a)

Explanation:

Context:

Recently, an international team of astronomers and astrophysicists has confirmed the first known observance of a tidally locked super-Earth exoplanet.

About Tidally locked Planet:

- A tidally-locked planet in its orbit around a star keeps the same face towards the star. **This happens when the rotation period of the planet around its own axis becomes equal to its revolution period around the star. Statement II is correct and is also the correct explanation of Statement I.**
- **On a tidally locked planet, one side is always facing a star while the other is cloaked in perpetual darkness.** The dark side could be so cold that water and would-be atmospheric components (e.g., carbon dioxide, nitrogen, or methane) are frozen, certainly an inhospitable environment for life. **Statement I is correct.**

Examples of Tidal Locking:

- **The Moon is tidally locked to the Earth** because it rotates in exactly the same time as it takes to orbit the Earth. That is why we only see one side of the Moon.
- **Pluto-Charon system:** Here both bodies are of comparable size and are close together, both bodies can be tidally locked to each other

Tidal locking does influence how a planet moves, because tidal locking slows down its spin.

This phenomenon of tidal locking can happen with other bodies in space too, as astronomers often say that binary stars or star systems that have two stars at their centre, are most likely tidally locked to each other.

Q20 ANSWER (a)

Explanation:

Context:

India is planning to manufacture carbon fibre for use in aerospace, civil engineering and defence as an alternative to metal which will help the country get around a proposed European Union carbon tax on steel, alloy and metal products

About Carbon Fibre

- **It is a material consisting of thin, strong crystalline filaments of carbon, essentially carbon atoms bonded together in long chains. Statement 1 is correct.**

Properties

- It has a high stiffness and stiffness-to-weight ratio.
- It has high tensile strength and strength-to-weight ratio.
- **It has high-temperature tolerance with special resins.**
- **It consists of low thermal expansion. Statement 2 is correct.**
- It also has high chemical resistance.
- The fibres are extremely stiff, strong, and light, and are used in many processes to create excellent structural materials.

Currently, India does not produce any carbon fibre, relying entirely on imports from countries such as the US, France, Japan and Germany. Statement 3 is incorrect.

Applications

- It is essential for various applications such as fighter planes' noses, civilian airplanes, drone frames, car chassis and fire-resistant building material.
- It is a critical material in technical textiles and is known for its high strength and lightweight properties.

Q21 ANSWER (b)

Explanation:

Places	Located in
1. Tepe Yahya	**Iran**
2. Umm-an-Nar	**UAE**
3. Mundigak	**Afghanistan**
4. Bampur Valley	**Iran**

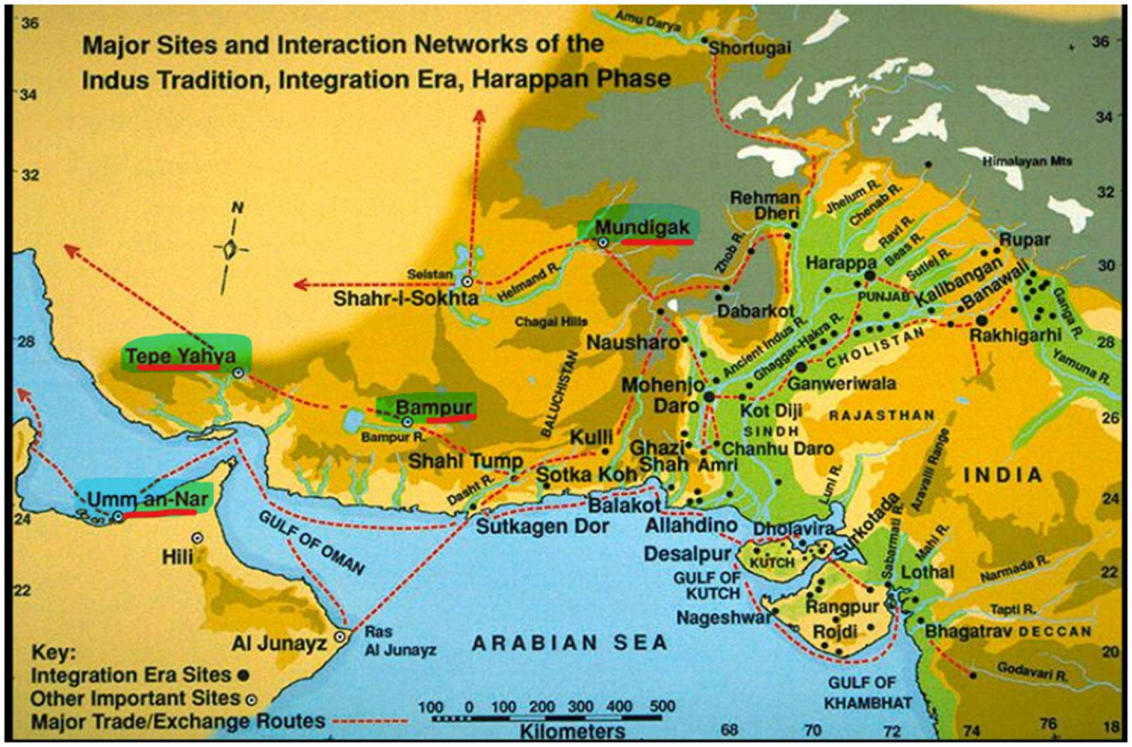
Context:

A human skeleton, along with pottery artifacts and animal bones has been found on the slope of a hillock in a Gujarat village.

About

- Archaeologists excavated a site called Padta Bet, it was 1.5 km from the mass burial ground of Juna Khatiya, an Early Harappan necropolis.

- In 2018, archeologists had unearthed a mass burial site with 500 graves on the outskirts of Khatiya village in Gujarat's Kutch district which raised the questions of whose graves are these?
- The latest find bolsters the theory that the graveyard site may have served as a common facility for a cluster of several such smaller settlements.
- The Archaeologists also found semi-precious stone beads made of carnelian and agate, terracotta spindle whorls, copper, lithic tools, cores and debitage, grinding stones and hammer stones.



Q22 ANSWER (a)

Explanation:

Context:

Restricted by surrogacy laws, Indians are going abroad to become parents.

Surrogacy (Regulation) Act, 2021

What is surrogacy?

- **The Act defines surrogacy as a practice where a woman gives birth to a child for an intending couple with the intention to hand it over to them after the birth.**
- It is permitted only for altruistic purposes or for couples who suffer proven infertility or disease.
- Surrogacy is prohibited for commercial purposes including for sale, prostitution or any other forms of exploitation.

Abortion: Abortion of such a foetus is allowed only with the consent of the surrogate mother and the authorities and must adhere to the provisions of the Medical Termination of Pregnancy Act.

Eligibility and Conditions for Couples: A couple should procure certificates of eligibility and essentiality in order to have a child via surrogacy.

- **The couple is deemed 'eligible' if they have been married for five years, the wife is aged between 23-50 years and the husband is between 26-55 years. Statement 1 is incorrect.**
- **The couple must not have any living child (biological, adopted or surrogate.)**
- A child with mental or physical disabilities, or one suffering from a life-threatening disorder has been exempted from the above criterion.
- The couple can get an 'essential' certificate if suffering from proven infertility of either partner certified by a District Medical Board.
- They must also have insurance coverage for 16 months for the surrogate mother, covering any postpartum complications.

Eligibility to be a surrogate: A surrogate mother has to be a close relative of the couple, a married woman with a child of her own, aged between 25-35 years, who has been a surrogate only once in her life. Statement 2 is incorrect.

- She must also possess a certificate of medical and psychological fitness for surrogacy.

Regulation: The Centre and State governments will constitute a National Surrogacy Board (NSB) and State Surrogacy Boards (SSB) respectively. Statement 3 is correct.

- This body is tasked with enforcing standards for surrogacy clinics, investigating breaches and recommending modifications.

Offences: Offences under the Act include commercial surrogacy, selling of embryos, exploiting, abandoning a surrogate child etc.

- These may invite up to 10 years of imprisonment and a fine of up to Rs. 10 lakhs.

Q23 ANSWER (c)

Explanation:

About PRATUSH Telescope:

- **Probing ReionizATion of the Universe using Signal from Hydrogen (PRATUSH) is a radio telescope to be sited on the moon's far side.**
- It is being built by the Raman Research Institute (RRI) in Bengaluru with active collaboration from the Indian Space Research Organisation (ISRO).
- Initially, ISRO will place PRATUSH into orbit around the earth. After some fine-tuning, the space agency will launch it moon wards.
- **Main roles: It will be to detect signals from the first stars and galaxies, reveal the cosmic dawn of the universe, answering the question when the first stars formed, the nature of the first stars and what was the light from the first stars.**

- It will carry a wideband frequency-independent antenna, a self-calibrating analog receiver and a digital correlator to catch radio noise in the all-important signal from the Dark Ages.
- The target instrument sensitivity is at the level of a few millikelvin without being limited by any systematic features.

Q24 ANSWER (a)

Explanation:

Context:

Recently, researchers have discovered nitrogen-fixing symbiotic organisms exhibiting behaviours similar to organelles.

About Nitrogen-Fixing Bacteria

- These are prokaryotic microorganisms that are capable of transforming nitrogen gas from the atmosphere into "fixed nitrogen" compounds, such as ammonia, that are usable by plants.

Types: There are two main types of nitrogen-fixing bacteria.

1. **Symbiotic or mutualistic:** These species live in root nodules of certain plants. Plants of the pea family, known as legumes which are some of the most important hosts for nitrogen-fixing bacteria.
   - Examples: Rhizobium, which is associated with plants in the pea family and various Azospirillum species, which are associated with cereal grasses.
2. **Other nitrogen-fixing bacteria are free-living and do not require a host. They are commonly found in soil or in aquatic environments.**
   - **Examples: Cyanobacteria Anabaena and Nostoc and genera such as Azotobacter, Beijerinckia, and Clostridium.**

Significance

- Nitrogen is a component of proteins and nucleic acids and is essential to life on Earth. Although nitrogen is abundant in the atmosphere, most organisms cannot use it in that form.
- Nitrogen-fixing bacteria accomplish more than 90 percent of all nitrogen fixation and thus play an important role in the nitrogen cycle.

Q25 ANSWER (c)

Explanation:

About OptiDrop Platform:

- **It is an innovative microfluidic chip-based platform that simplifies and reduces the cost of studying single cells. Statement 1 is correct.**

- It employs a novel approach that enables precise and cost-effective analysis of single cells encapsulated in droplets.
- The platform's unique features include live data visualisation, a smaller data footprint, and a 'closed' system design that prevents external contamination.
- This research was supported by the Biotechnology Industry Research Council (BIRAC), the Department of Science and Technology (DST), and the Ministry of Human Resource Development (MHRD).

Applications:

- **This cutting-edge technology has potential applications in diagnostics, therapeutics, agriculture, and animal health. Statement 2 is correct.**
- **It helps in studying the impact on individual cells during a drug screen, environment control (water contamination counter), detection and sorting of CAR-T cells in immuno-onco therapeutics, selection of CRISPR-modified single cells and selection of high-efficiency clones in single-cell genomics**

What is C-CAMP?

- **It is an initiative supported by the Department of Biotechnology, Govt of India is a catalyst of cutting-edge research and innovation in the life sciences since 2009.**
- It is mandated to promote entrepreneurship and innovation. It has created and fostered an entrepreneur-friendly culture in and around the Academic/Research environment through its involvement in Seed Funding Schemes for Startups.

What is a Microfluidic chip?

- **It is referred to as lab-on-a-chip devices, which are miniature platforms that manipulate and analyse small volumes of fluids.**
- These chips integrate various functions, such as mixing, pumping, and sensing, onto a compact substrate, enabling precise control over minute amounts of liquids.

Q26 ANSWER (b)

Explanation:

Context:

According to a study conducted by IIM-A, nuclear energy makes up only 1.6% of India's energy mix.

- **Unlike fossil fuel-fired power plants, nuclear reactors do not produce air pollution or carbon dioxide while operating. Statement 1 is incorrect.**
- Some radioactive wastes are produced such as uranium mill tailings, spent (used) reactor fuel, and other radioactive wastes which are removed during refuelling or maintenance.
- **Reactors cooled and moderated by water generate more liquid waste than those cooled by gas.**
- **Hence, the volumes of liquid waste generated at boiling-water reactors (BWRs) are significantly higher than at pressurised water reactors (PWRs). Statement 2 is correct.**

- **The most frequently applied methods for treating the liquid waste generated by nuclear reactors are cementation, bituminization, or incorporation into polymers.**
- **Bituminization is a hot process which allows the wet stream to be dried off before being immobilized and packaged. Statement 3 is correct.**
- This technique is widely used for conditioning of radioactive waste at nuclear power plants in the USA, Japan, Sweden, USSR, Switzerland, and other countries.

Q27 ANSWER (b)

Explanation:

- Taiwan is an archipelago of small islands featuring Taiwan Island as the dominate landmass
- Located off the East coast of China and administrated by the Chinese government
- Surrounding bodies of water include the Taiwan Strait off the West, the East China Sea off the North, the Philippine Sea off the East and the South China Sea off the South
- The plains and lowlands of the Western half house most of the population
- Mountains abound in the Eastern half.

Q28 ANSWER (b)

Explanation:

Context:

A unique conservation agricultural practice, Paira cropping system has dwindled in recent years due to climate change.

About Paira cropping system:

- The utera/paira is a type of cropping which is commonly practiced in Bihar, Eastern Uttar Pradesh, West Bengal Chhattisgarh and Odisha.
- **It is a kind of relay method of sowing in which lentil/ lathyrus/ urdbean/ mungbean seeds are broadcast in the standing crop of rice about 2 weeks before its harvest.**
- **This system does not allow agronomic intervention such as tillage, weeding, irrigation and fertilizer However, rice variety decides the productivity of pulses in this system.**

Advantages:

- This practice enables us to use better soil moisture available at the time of harvesting of rice crops, which could otherwise be lost quickly.
- Experimental evidence showed that paira cropping produced more yield of lentil than planting with tillage after harvesting of the rice crop.
- This is an efficient way of utilising resources for sustainable crop intensification and boosting land productivity.

What is the Relay cropping method?

- **It is a method of multiple cropping where one crop is seeded into standing second crop well before harvesting of second crop.**
- It can solve a number of conflicts such as inefficient use of available resources, controversies in sowing time, fertilizer application and soil degradation.

Q29 ANSWER (c)

Explanation:

- **The Election Commission can identify political parties and assign symbols according to the Election Symbols (Reservation and Allotment) Order, 1968. A political party is assigned a standard emblem known as an electoral or election symbol.**
- It was suggested in the 1960s that the Symbol Order, a statute of Parliament, be used to regulate, reserve, and allot election emblems.
- In response to this suggestion, the ECI declared that the allotment of symbols and the recognition of political parties are subject to the terms of the Election Symbols (Reservation and Allotment) Order, 1968.
- **If a party is recognised as a `National Party', it is entitled to exclusive allotment of its reserved symbol to the candidates set up throughout India. Statement 1 is correct.**
- **The Election Symbols (Reservation and Allotment) Order, 1968 prohibits parties from using emblems with religious or community implications. Statement 2 is correct.**
- **Rule 10B of the Symbols Order provides that the concession of a common free symbol shall be available to a 'registered unrecognised party' for two general elections. Statement 3 is correct.**
- Furthermore, a party shall be eligible for a common symbol in any subsequent general election if it had secured at least 1% of votes polled in the State on the previous occasion when the party availed of this facility.

Q30 ANSWER (c)

Explanation:

Project Akashteer

- **It is a cutting-edge initiative designed to automate air defence control and reporting processes by digitising the entire process.**
- The project aimed at enhancing the operational efficiency and integration of the Army's air defence mechanisms.
- **Developed by - Bharat Electronics Limited (BEL) as part of the 'Atmanirbhar Bharat' initiative.**
- **Indian Army has declared the year 2024 as the "Year of Tech Absorption'.**

Q31 ANSWER (c)

Explanation:

Context:

World Health Organization unveils a digital health promoter prototype S.A.R.A.H harnessing generative Artificial Intelligence (AI) for public health.

About S.A.R.A.H.:

- **Smart AI Resource Assistant for Health (S.A.R.A.H.) is a digital health promoter prototype with enhanced empathetic response powered by generative artificial intelligence (AI).**
- **It is launched by the World Health Organisation (WHO). It aims to provide an additional tool for people to realize their rights to health, wherever they are.**

Features:

- It is trained to provide information across major health topics, including healthy habits and mental health
- It has the ability to support people in developing better understanding of risk factors for some of the leading causes of death in the world, including cancer, heart disease
- It can help people access up-to-date information on quitting tobacco, being active, eating a healthy diet and de-stressing among other things.
- It can engage users 24 hours a day in 8 languages on multiple health topics, on any device. It is now powered by generative AI rather than a pre-set algorithm or script helping her to provide more accurate responses in real-time.

Q32 ANSWER (c)

Explanation:

Context:

RBI defers Exchange Traded Currency Derivatives (ETCDs) norms.

- **ETCD is a standardized financial contract that is traded in stock exchanges in a regulated manner. Statement 1 is correct.**
- **They are subject to the rules framed by market regulators such as Securities and Exchange Board of India (SEBI) in India. Statement 2 is correct.**
- ETCD are essentially contracts, deriving values from the price fluctuation of their underlying assets.

Types of Derivatives – They are two types of derivatives:

- One that is subject to standardized terms and conditions, and hence being traded in the stock exchanges.
- Second type being traded between private counter-parties, in the absence of a formal intermediary.
- The first type is known as Exchange Traded Derivatives (ETDs), the second is known as Over the Counter (OTC) derivatives.
- Types of ETDs – Stock ETDs, Index ETDs, Currency ETDs, Commodity ETDs, and Bond ETDs.

Working – Exchange-traded currency contracts work on the same principle of buying at a low price and selling at a higher price.

However, exchange-traded currency contracts are always bought in pairs:

1. Indian Rupee vs United States Dollar (USD-INR)
2. Indian Rupee vs Euro (EUR-INR)
3. Indian Rupee vs Great Britain Pound (GBP-INR)
4. Indian Rupee vs Japan's Yen (JPY-INR)

Q33 ANSWER (d)

Explanation:

Context:

Delhi High Court declared Haldiram and its oval-shaped logo as well-known trademark for food items, restaurants, and eateries under the Trade Marks Act, 1999.

- **The Trade Marks Act, 1999, provides protection to well-known trademarks to prevent misuse and obligates the Registrar to safeguard them against similar trademarks. Statement 1 is incorrect.**
- Once a mark is declared well-known, the owner can prevent others from registering or using identical or similar marks for different goods and services.
- A well-known mark adds value to a brand and increases its reputation in the market.
- **License – A well-known mark can be licensed or franchised to others. Statement 2 is incorrect.**

Criteria – The Indian Trademarks Act provides several factors that can be considered when determining whether a trademark is well-known, including:

- The degree of knowledge or recognition of the mark in the relevant section of the public in India.
- The duration, extent, and geographical area of any use of the mark in India.
- The duration, extent, and geographical area of any promotion of the mark in India.
- The degree of inherent or acquired distinctiveness of the mark.
- The extent to which the mark has been registered in India or in other countries.

Registrar of Trade Marks – The Registrar of Trade Marks maintains a list of famous trademarks in India. This list includes both Indian and foreign trademarks. Statement 3 is incorrect.

Some of the well-known marks in India include, Amul, Coca-Cola, Bisleri, Google, Pepsi, Nestle, McDonald's, Samsung, LG, Nike, BMW, Mercedes-Benz, Sony, Nokia, and Adidas.

Q34 ANSWER (d)

Explanation:

Context:

The National Pharmaceutical Pricing Authority (NPPA) has hiked the price of essential medicines including painkillers, antibiotics and anti-infectives.

- **NPPA was set up under the Department of Pharmaceuticals is an independent regulatory agency that controls the prices of pharmaceutical drugs in India.**

About

- **Essential medicines are those that satisfy the priority healthcare needs of the majority of the population. Statement 1 is correct.**
- The essential medicines list needs to be country specific addressing the disease burden of the nation and the commonly used medicines at primary, secondary and tertiary healthcare levels.
- **The first country in the world to compose its EML was Tanzania in 1970. Statement 4 is correct.**
- **In India, The Ministry of Health and Family Welfare prepared the first National List of Essential Medicines (NLEM) in 1996. Subsequently, the list has been revised. Statement 2 is correct.**
- **Drug Price Control Order, 2013 was issued by the Department of Pharmaceuticals under Ministry of Chemicals and Fertilizers for fixing the ceiling price of medicines included in NLEM. Statement 3 is correct.**

Q35 ANSWER (b)

Explanation:

Context:

Recently, the new generation ballistic missile Agni-Prime was successfully flight-tested by the Strategic Forces Command (SFC) along with the DRDO from the Dr APJ Abdul Kalam Island off the coast of Odisha. Statement 2 is correct.

About the Agni-Prime

- **It is a two-stage, surface-to-surface, canister-launched, road-mobile, and solid-fueled medium-range ballistic missile. Statement 1 is incorrect.**
- The Agni-Prime is equipped with a dual redundant navigation and guidance system.
- It has a range between 1000 to 2000 km.
- The missile is lighter than all the earlier Agni series of missiles.
- It features significant upgrades to the composite motor casing, a manoeuvrable reentry vehicle (MaRV), along with improved propellants, navigation, and guidance systems.

Strategic Forces Command (SFC)

The Strategic Forces Command (SFC), sometimes called Strategic Nuclear Command, forms part of India's Nuclear Command Authority (NCA).

- **The Nuclear Command Authority comprises a Political Council and an Executive Council. The Political Council is chaired by the Prime Minister.** It is the sole body which can authorise the use of nuclear weapons.
- **The Executive Council is chaired by the National Security Advisor.** It provides inputs for decision making by the Nuclear Command Authority and executes the directives given to it by the Political Council.
- It is responsible for the management and administration of the country's tactical and strategic nuclear weapons stockpile.

Q36 ANSWER (b)

Explanation:

Context:

Research centre in Romania has developed the world's most powerful laser.

About Romania

- It is located in the geographic centre of Europe.
- Its neighbour to the North of Ukraine, to the East on the Republic of Moldova, Ukraine, and the Black Sea, to the South on Bulgaria, to the South-West on Serbia, and to the West on Hungary.
- Bucharest, the capital city.
- The Black Sea forms the border of Romania in the south-east along 245 km.
- Geographical Features: Romania's relief is very diverse and complex. 31% of the area is covered by mountains, 36% by hills and tablelands, and the rest of 33% by plains.
    - In the centre lies the Plateau of Transylvania, surrounded by the chains of the Carpathians Mountains
    - the highest elevation in Romania being the Moldoveanu Peak.

- The Danube River travels through Romanian territory.

Q37 ANSWER (c)

Explanation:

Context:

A century after the electroencephalogram (EEG) was discovered, it remains a crucial tool for understanding the brain.

About Electroencephalogram (EEG):

- **An EEG is a recording of brain activity.**
- **It is a test that detects abnormalities in your brain waves, or in the electrical activity of your brain.**

Procedure:

- The procedure may be short, often just a 30-minute recording.
- During the procedure, electrodes consisting of small metal discs with thin wires are pasted onto your scalp.
- The electrodes detect tiny electrical charges that result from the activity of your brain cells.
- The charges are amplified and appear as a graph on a computer screen or as a recording that may be printed out on paper.
- The EEG procedure is usually carried out by a highly trained specialist, called a clinical neurophysiologist.

Applications:

The EEG is used to evaluate several types of brain disorders. Examples:

- When epilepsy is present, seizure activity will appear as rapid spiking waves on the EEG.
- People with lesions of their brain, which can result from tumours or strokes, may have unusually slow EEG waves, depending on the size and location of the lesion.
- The EEG may also be used to determine the overall electrical activity of the brain (for example, to evaluate trauma, drug intoxication, or extent of brain damage in comatose patients).
- The EEG may also be used to monitor blood flow in the brain during surgical procedures.

Q38 ANSWER (d)

Explanation:

Context:

Recently, scientists proposed a model to explain Arrokoth's ice core.

- **Arrokoth is one of thousands of 'icy worlds" in the Kuiper Belt, or the outer zone of the solar system that lies beyond Neptune.**
- **It is the farthest object in space that has been explored by a human space-craft.**

Discovery and Naming

- **Arrokoth was discovered on June 26, 2014, by astronomers using the Hubble Space Telescope as part of the New Horizons KBO Search (NHATS) program.**
- **Originally known as (486958) 2014 MU69, it was informally called Ultima Thule until its official naming.**
- **The name "Arrokoth" was chosen in November 2019.**
- It is a Native American term meaning "sky" in the Powhatan/Algonquian language.

Characteristics:

- Arrokoth is located approximately 44 astronomical units (AU) from the Sun, meaning it's about 44 times farther from the Sun than Earth.
- It is a cold, dark, and ancient relic of the early Solar System, believed to have formed over 4.5 billion years ago.
- Arrokoth is an elongated binary object composed of two lobes, informally referred to as "Ultima" and "Thule". Each lobe is roughly spherical in shape, and they are joined by a narrow neck.
- Its dimensions are approximately 36 kilometers by 20 kilometers for the larger lobe (Ultima) and 21 kilometers by 19 kilometers for the smaller lobe (Thule).
- The surface of Arrokoth is covered in reddish material, likely organic compounds that have been altered by radiation from the Sun over billions of years.

Q39 ANSWER (c)

Explanation:

Context:

Recently, the US White House officially directed the National Aeronautics and Space Administration (NASA) to create a time standard for the Moon, which different international bodies and private companies can use to coordinate their activities on the lunar surface.

About Coordinated Lunar Time (LTC)

- It will provide a time-keeping benchmark for lunar spacecraft and satellites that require extreme precision for their missions.
- It will also synchronise the communication between satellites, astronauts, bases and the Earth.
- A unified time standard would be essential for coordinating operations, ensuring the reliability of transactions and managing the logistics of lunar commerce.

Why there is need of LTC?

- **As there is less gravity on the Moon, time ticks slightly faster there relative to the time on the Earth. Statement 1 is correct.**
- **In other words, for someone on the Moon, an Earth-based clock will appear to lose on average 58.7 microseconds per Earth Day with "additional periodic variations. Statement 2 is correct.**
- It can create problems for situations such as a spacecraft seeking to dock on the Moon, data transferring at a specific time, communication, and navigation.

How does Earth's time standard work?

- Most of the clocks and time zones of the world are based on Coordinated Universal Time (UTC) which is essentially an internationally agreed upon standard for world time.
- It is set by the International Bureau of Weights and Measures in Paris, France.
- It is tracked by a weighted average of more than 400 atomic clocks placed in different parts of the globe.
    - **Atomic clocks measure time in terms of the resonant frequencies — the natural frequency of an object where it tends to vibrate at a higher amplitude — of atoms such as cesium-133.**
    - In atomic time, a second is defined as the period in which a caesium atom vibrates 9,192,631,770 times. As the vibration rates at which atoms absorb energy are highly stable and ultra-accurate, atomic clocks make for an excellent device for gauging the passage of time.
    - **To obtain their local time, countries need to subtract or add a certain number of hours from UTC depending on how many time zones they are away from 0-degree longitude meridian, also known as the Greenwich meridian.**
    - **If a country lies on the west of the Greenwich meridian, it has to subtract from the UTC, and if a country is located on the east of the meridian, it has to add.**

Q40 ANSWER (c)

Explanation:

Context:

Recently, the Chief Postmaster General Maharashtra Circle inaugurated the Bharati Branch Post Office at Bharati Station of Antarctica accompanied by the introduction of a new PIN code, MH-1718.

Brief History of Post Offices in Antarctica

- **In 1984, shortly after the inaugural expedition to Antarctica, India established its first-ever post office at Dakshin Gangotri — the pioneering scientific base. Statement 1 is correct.**
- The eventual submersion of Dakshin Gangotri under ice during the late 1980s, leading to its decommissioning.
- **On January 26, 1990, a new post office branch emerged at India's Maitri research station in Antarctica. Statement 2 is correct.**

Maitri and Bharati Post Offices:

- These are research bases of India in Antarctica spanning a distance of 3,000 kms.
- **They stand as a testament to the nation's enduring presence in the polar landscape, both falling under the purview of the Goa Postal Division. Statement 3 is correct.**
- In practical terms, letters intended for Antarctica find their way to the National Centre for Polar and Ocean Research (NCPOR) in Goa, the pivotal hub for India's polar endeavours.

India and Antarctica

- India's engagement with Antarctica, the southernmost continent and site of the South Pole, traces back to 1981.
- **It marked the initiation of the Indian Antarctic Programme, a multi-disciplinary, multi-institutional programme under the control of the NCPOR, Ministry of Earth Sciences.**
- It gained global acceptance with India's signing of the Antarctic Treaty and subsequent construction of the **Dakshin Gangotri (in 1983), Maitri (in 1989), Bharati (in 2012) were commissioned.**
- **Currently, India has two operational research stations in Antarctica: Maitri and Bharati.**

Q41 ANSWER (b)

Explanation:

Context:

With supply chain disruptions during the pandemic and recent geopolitical tensions, many countries, including India, have realised the importance of investing in chip manufacturing infrastructure.

About the Semiconductor Chip

- A semiconductor has properties between a conductor, which conducts electricity, and an insulator, which does not.
- In its purest form, a semiconductor is a very weak conductor of electricity.
- However, its electrical properties can be changed by adding small amounts of certain substances called 'dopants'.
- By taking a pure semiconductor and carefully injecting certain parts with specific dopants, complex circuits can be 'printed' on the semiconductor.

The Manufacturing Process:

It involves several critical steps like deposition, photoresist, lithography, etch, ionisation, and packaging.

Deposition: It begins with a silicon wafer. Wafers are sliced from a salami-shaped bar of 99.99% pure silicon (known as an 'ingot') and polished to extreme smoothness.

- Thin films of conducting, isolating, or semiconducting materials are deposited on the wafer to enable the first layer to be printed on it.

Photoresist Coating: The wafer is then covered with a light-sensitive coating called 'photoresist', or 'resist' for short.

- Positive Resist: The areas exposed to ultraviolet light change their structure and are made more soluble – ready for etching and deposition.

Lithography: It is a crucial step in the chipmaking process, because it determines just how small the transistors on a chip can be.

- During this stage, the chip wafer is inserted into a lithography machine where it's exposed to deep ultraviolet (DUV) or extreme ultraviolet (EUV) light.

Etching: It refers to any technology that will selectively remove material from a thin film on a substrate (with or without prior structures on its surface) and by this removal create a pattern of that material on the substrate.

Q42 ANSWER (a)

Explanation:

Context:

In ecology, 'gape limitation' stands for the idea that a predator can only eat things that fit in its mouth.

About

- Researchers pay attention to the concept because it specifies which animals can eat which other animals.
  - For example, small predators can only eat small prey, while bigger predators can eat bigger prey.
- Gape limitations also influence how animals evolve over time.

- Prey animals might get faster or grow bigger to avoid being eaten by predators with smaller mouths.
- On the other hand, predators may evolve larger mouths to eat larger prey.

- Significance: Understanding gape limitations is essential to predicting how changes in predator or prey populations, changes in habitats, and/or environmental disturbances could affect the structure and function of ecosystems.

Q43 ANSWER (b)

Explanation:

Context:

Underpriced onion export to UAE, yielding windfall profits for selected importers, has aggrieved Indian farmers and traders.

About:

- The onion is an herb that belongs to the lily family. It is an important horticultural commodity grown worldwide for their culinary purposes and medicinal values.
- **Indian onions have two crop cycles, first harvesting which starts from November to January and the second harvesting from January to May. Statement 2 is incorrect.**
- **Major varieties found in India:** Agrifound Dark Red, Agrifound Light Red, NHRDF Red, Agrifound White, Agrifound Rose and Agrifound Red, Pusa Ratnar, Pusa Red, and Pusa White Round.
- **Major Producer: India is the world's second-largest onion producer. Statement 1 is correct.**
- Maharashtra, Karnataka, Orissa, Uttar Pradesh, Gujarat, Andhra Pradesh, and Tamil Nadu are the major onion-producing states.
- **Maharashtra ranks first in Onion production with a share of 42.53% followed by Madhya Pradesh with a share of 15.16% in 2021-22 (3rd Advance Estimate). Statement 3 is incorrect.**
- **Major Export Destinations (2022-23): Bangladesh, Malaysia, United Arab Emirates, Sri Lanka, Nepal and Indonesia. Statement 4 is correct.**

What is Windfall Profit?

- Windfall profit is an unexpected gain in income which could be due to winning a lottery, unforeseen inheritance or shortage of supply.
- Windfall gains are transitory in nature.

Q44 ANSWER (a)

Explanation:

Context:

Climate activist Sonam Wangchuk and Leh Apex Body (LAB) decided to call off the Pashmina border march aimed at highlighting the plight of the Changpa nomadic tribes.

Tribes	Associated State/UT
1. Changpa Tribe	**Ladakh**
2. Jenu Kuruba Tribe	**Karnataka**
3. Siddi Tribe	**Goa**
4. Tharu Tribe	**Uttar Pradesh**

About Changpa Tribe:

- **The Changpa, or Champa, are semi-nomadic people found mainly in the Changtang plateau of southeastern Ladakh.** They share linguistic and cultural affinities with Tibetans.
- All Changpa families profess Tibetan Buddhism as their religion. They are high-altitude pastoralists, raising mainly yaks and goats.
- They can be identified by their conical yak-skin tents called reboo.
- Each reboo invariably accommodates the family deity, and a picture of their spiritual head, in most cases, the Dalai Lama.

About Jenu Kuruba Community:

- Jenu in Kannada means honey and kuruba is the caste. As the name suggest Jenu Kurubas are honey gatherers.
- **They are a traditional honey gathering tribe, and are among the original inhabitants of the forests of the Western Ghats that stretch over three states – Karnataka, Kerala and Tamil Nadu.**
- They live in small settlements called Hadi.
- Occupation: The main occupation used to be food gathering in the forests, collection of minor forest produces in the forests, collection of minor forest produce including honey
- They practice shifting cultivation, leading to a nomadic lifestyle.
- Social life: People of this community live a semi-nomadic lifestyle which is not maintained by rulers, police, centralized visible forces or religious monasteries; but by the technique of its own discipline and diffused power.

About Siddi Tribe:

- The Siddis, an ethnic group in India, are said to have descended from the Bantu peoples of the East African region.
- They are included in the list of Scheduled Tribes (ST) in Karnataka.
- **Karnataka, Gujarat and Hyderabad are the main population centres of the Siddi community in India.**

About Tharu Tribe:

- The Tharu people are an ethnic group indigenous to the Terai in southern Nepal and northern India.
- They speak Tharu languages. They are recognized as an official nationality by the Government of Nepal.

- **In the Indian Terai, they live foremost in Uttarakhand, Uttar Pradesh and Bihar. The Government of India recognizes the Tharu people as a scheduled tribe.**

Q45 ANSWER (b)

Explanation:

Context:

Recently, the US National Oceanic and Atmospheric Administration has predicted an 83% probability of the Oceanic Niño Index (ONI) transitioning to a neutral range by April-June 2024.

About Oceanic Niño Index:

- It is the National Oceanic and Atmospheric Administration's (NOAA) primary indicator for monitoring the ocean part of the seasonal climate pattern called the El Niño-Southern Oscillation, or "ENSO".
- **The ONI tracks the running 3-month average sea surface temperatures in the east-central tropical Pacific between 120°-170°W, near the International Dateline, and whether they are warmer or cooler than average. Statement 1 is incorrect.**
- **Index values of +0.5 or higher indicate El Niño and values of -0.5 or lower indicate La Niña. Statement 2 is correct.**

What are El Nino and La Nina?

- El Nino and La Nina are two opposing climate trends that deviate from the normal conditions and normally run nine to twelve months, but can often extend.
- These events occur every two to seven years on average (El Nino is more frequent than La Nina), but not on a regular basis and together are referred to as the El Nino-Southern Oscillation (ENSO) cycle by scientists.
- El Nino is typically known as the warm phase (a band of warmer water spreading from west to east in the equatorial Pacific Ocean) and La Nina is identified as the cold phase (a band of cooler water spreads east-west) of ENSO.
- Both El Nino and La Nina can have global effects on weather, wildfires, ecosystems and economics.

Q46 ANSWER (c)

Explanation:

Context:

The findings of an international study suggest that consuming low glycaemic index and low glycaemic load diets might prevent the development of type 2 diabetes.

About Glycaemic Index

- It ranks carbohydrate-containing foods based on the blood glucose response, post-prandial or after a meal. The higher the blood sugar reading, the higher will be the GI.
- **It shows how quickly each food affects your blood sugar (glucose) level when that food is eaten on its own.**
- **Foods are ranked on a scale of 0 to 100, with pure glucose (sugar) given a value of 100.**
- The lower a food's glycaemic index, the slower blood sugar rises after eating that food. In general, the more processed a food is, the higher its GI, and the more fibre or fat in a food, the lower it's GI.

What is Glycaemic load?

- It is both the quality and quantity of carbohydrate in a specific food, and is the product of the GI and the amount of carbohydrate available in a serving.

Key facts about Diabetes

- It is a chronic disease that occurs when the pancreas can no longer make insulin, or the body cannot make good use of the insulin it produces.
- Insulin is a hormone that regulates blood glucose.
- Not being able to produce or use insulin effectively leads to raised glucose levels in the blood, known as hyperglycaemia.
- Over the long-term high glucose levels are associated with damage to the body and failure of various organs and tissues.

Type of Diabetes

- **Type 1 diabetes:** It is a condition in which your immune system destroys insulin-making cells in your pancreas. These are called beta cells.
- When you have type 1 diabetes, your body produces very little or no insulin.
- It requires daily administration of insulin to maintain blood glucose levels under control. It is usually diagnosed in children and young people, so it used to be called juvenile diabetes.
- **Type 2 diabetes:** It results from the body's ineffective use of insulin that it produces. This type of diabetes is largely the result of excess body weight and physical inactivity.

Q47 ANSWER (a)

Explanation:

Context:

Recently, the Reserve Bank of India (RBI) Governor raised concerns over unauthorised forex trading platforms and asked banks to maintain vigil against such illegal activities.

About Electronic Trading Platforms:

- These are electronic systems, other than a recognised stock exchange, on which transactions in eligible instruments like securities, money market instruments, foreign exchange instruments, derivatives, etc. are contracted.

- **In India no entity shall operate an ETP without obtaining prior authorisation of RBI under The Electronic Trading Platforms (Reserve Bank) Directions, 2018. Statement 1 is incorrect.**
- Resident persons operating ETPs without authorisation from RBI, collecting and effecting/remitting payments directly/indirectly outside India shall render themselves liable for penal action, including the Foreign Exchange Management Act, 1999 and the Prevention of Money Laundering Act, 2002.
- **ETPs authorised by the Reserve Bank shall host transactions only in instruments approved by the Reserve Bank. Statement 2 is correct.**

Criteria for authorization of ETPs

- The entity shall be a company incorporated in India.
- **An entity seeking authorisation as an ETP operator shall maintain a minimum net-worth of Rs.5 crore (Rupees five crore only) and shall continue to maintain the minimum net-worth prescribed herein at all times. Statement 3 is correct.**
- The existing entities operating ETPs with a net-worth lower than the prescribed net-worth requirement shall achieve the minimum net-worth of Rs.5 crores within one year from the date of authorisation by the Reserve Bank.
- Banks seeking authorisation to operate ETP shall earmark a minimum capital of Rs.5 crore for the purpose.

Q48 ANSWER (b)

Explanation:

Context:

Recently, the atmospheric scientists have noticed the development of the polar vortex and characterised it as one of the biggest events in the last four decades.

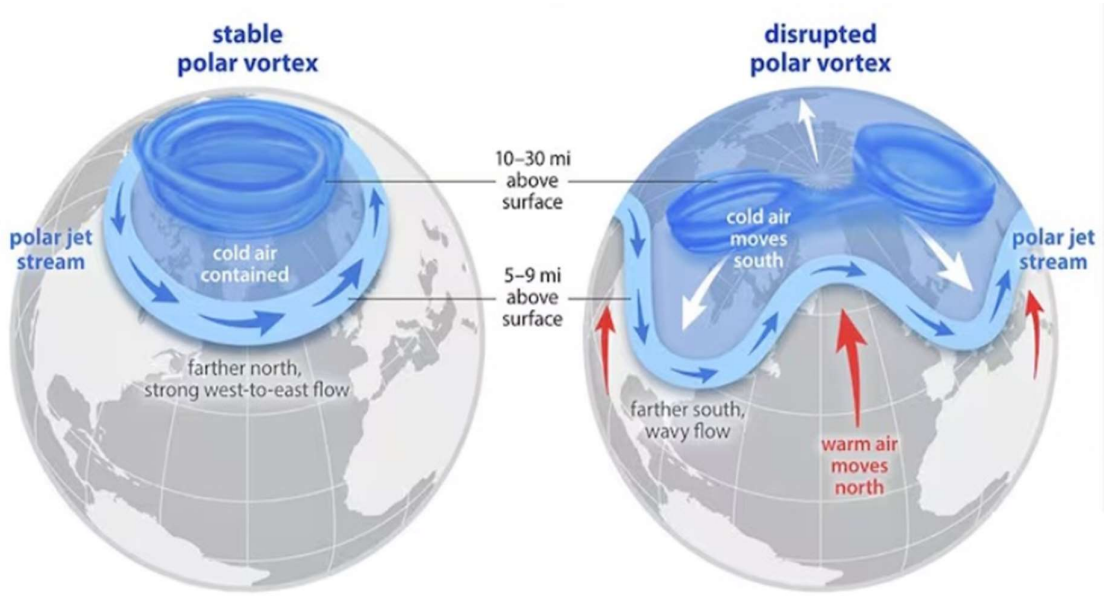
About the Earth's Polar Vortex:

- **It is a large area of low pressure and cold air that surrounds both of the Earth's poles.**
- **It exists near the poles throughout the year, but it weakens in summer and strengthens in winter.**
- It is located in the polar stratosphere, above the layer of the atmosphere (the troposphere) where most weather, including the jet stream, occurs.
- The Stratospheric Polar Vortex forms in the winter hemisphere when the Earth's pole is pointed away from the sun.
- The term 'vortex' refers to the counterclockwise flow of air that helps keep the colder air near the Poles.

Impact on Weather Patterns

- It significantly influences winter weather.
- **When the Polar Vortex is especially strong, the polar jet stream tends to stay farther north and exhibits a more zonal flow, with less meandering. Statement 1 is incorrect.**

- At the surface, it is often associated with an even colder than usual Arctic, and milder-than-usual weather in the mid-latitudes.
- **Conversely, when the Polar Vortex weakens, shifts, or splits, the polar jet stream often becomes extremely wavy, allowing warm air to flood into the Arctic and polar air to sink down into the mid-latitudes. Statement 3 is correct.**
- **It can result in extreme cold snaps, snowstorms, and other winter weather events in areas like North America, Europe, and Asia. Statement 2 is incorrect.**



Q49 ANSWER (c)

Explanation:

Context:

India has invoked the peace clause at the World Trade Organization (WTO) for the fifth consecutive time for the marketing year 2022-23 (October-September) due to breaching the prescribed subsidy limit for rice offered to its farmers.

- While India's rice production was valued at $52.8 billion in 2022-23, farmers received a subsidy worth $6.39 billion during the year.
- Thus, the rice subsidy was 12 percent of the value of production, thereby breaching the 10 per cent domestic support ceiling, which is in accordance with global trade rules.
- **It was established in 2013 under the Bali Agreement. Statement I is correct.**
- **It permits developing nations to exceed the 10 per cent ceiling without facing legal action by other members temporarily. Statement II is incorrect.**

bout Peace Clause

- Under the Peace Clause, WTO members refrain from challenging any breach in the prescribed subsidy ceiling given by a developing nation at the dispute settlement forum of the WTO.
- Subsidies over and above the prescribed ceiling are seen as trade-distorting.
- **Subsidy ceiling: Under the global trade norms, a WTO member country's food subsidy bill should not breach the limit of 10 percent of the value of production based on the reference price of 1986-88.**
- India has been seeking amendments to the formula for calculating this food subsidy cap.
- As an interim measure, the WTO members at the Bali ministerial meeting in December 2013 agreed to put in place a mechanism popularly called the Peace Clause and committed to negotiating an agreement for a permanent solution.
- This clause will be there till a permanent solution is found to the food stockpiling issue.
- **While the 'peace clause' allows developing countries to breach the 10% ceiling without invoking legal action by members, it is subject to onerous notification requirements and numerous conditions such as not distorting global trade and not affecting food security of other members.**

Q50 ANSWER (c)

Explanation:

Context:

UN Security Council refers Palestinian application to become full UN member to committee.

- **Open to – UN full membership is open to all peace-loving States that accept the obligations contained in the United Nations Charter and are able to carry out these obligations.**
- States are admitted to membership in the United Nations by a decision of the General Assembly upon the recommendation of the Security Council.

The procedure –

- The State submits an application to the Secretary-General and a letter formally stating that it accepts the obligations under the Charter.
- The Security Council considers the application.
- **Any recommendation for admission must receive the affirmative votes of 9 of the 15 members of the Council, provided that none of its five permanent (P5) members have voted against the application. Statement 1 is correct.**
- P5 members – China, France, the Russian Federation, the United Kingdom of Great Britain and Northern Ireland and the United States of America.
- **If the Council recommends admission, the recommendation is presented to the General Assembly for consideration. Statement 2 is correct.**
- **A two-thirds majority vote is necessary in the Assembly for admission of a new State. Statement 3 is correct.**
- Membership becomes effective the date the resolution for admission is adopted.

- It should be noted that the normal change of Governments, as through a democratic election, does not raise any issues concerning the credentials of the representative of the State concerned.

Q51 ANSWER (c)

Explanation:

Context:

Recently, the Department of Archaeology and Museums have unearthed a coin hoard at the Phanigiri in Suryapet district, Telangana.

About Phanigiri

- **It is a famous Buddhist site located 110 km away from Hyderabad.**
- This site derived its name from the shape of the hillock, which appears to be like a snake hood. The word Phani in Sanskrit means snake and Giri means hillock.
- It is believed to be one of the important Buddhist monasteries strategically located on the ancient trade route (Dakshinapatha) connecting the west and the east coast of the Deccan.

Other findings of the excavation

- Coins: Lead coins with elephant symbol on one side and Ujjain symbol on the other side are found.
- According to the archaeologists, the coins belong to the Ikshvaku period dated between 3rd century and 4th century Common Era.
- Also, stone beads, glass beads, shell bangle fragments, stucco motifs, broken limestone sculptures, a wheel of a toy cart, final nails and pottery are excavated.
- Mahastupa, apsidal Chaityagrihas, Votive stupas, pillared congregation halls, Viharas, platforms with staircases at various levels, octagonal stupa chaitya, 24-pillared mandapam, circular chaitya, and cultural materials that included terracotta beads, semi-precious beads, iron objects, Brahmi label inscriptions and holy relic casket are also excavated.
- All the cultural material is datable from the 1st century BCE to 4th century CE.

About Sannati Buddhist site:

- **It is the ancient Buddhist site on the bank of Bhima River near Kanaganahalli (forming part of Sannati site) in Kalaburagi district, Karnataka.** It is also popular among tourists for the Chandrala Parameshwari Temple.

Major findings in this site:

- It is believed to have been developed in three constructional phases – Maurya, Early Satavahana and Later Satavahana periods stretching from 3rd Century B.C. to 3rd Century A.D.
- Ranamandala area of Sannati offers a unique chronological scale from prehistoric to early historic times.
- An inscription written in the Prakrit language using the Brahmi script is also found here.

- The excavation also recovered another precious stone of historical importance – a stone sculpture portraying Mauryan Emperor Ashoka. The emperor is seen surrounded by his queens and female attendants in this rare sculpture. The sculpture had the words "Raya Asoko" etched on it in Brahmi script leaving little scope for mistaking the identity of the man featured in it.
- The recoveries included around 60 dome slabs with sculptural renderings of selected Jataka stories, main events in the life of the Master, portraits of Shatavahana monarchs and certain unique depictions of Buddhist missionaries sent by Ashoka to different parts

Sankisa, Uttar Pradesh

- **It is thought to be the location where Buddha descended from heaven after giving teachings to his mother.**
- Sankisa is famous for a Bisari Devi shrine and an unearthed Ashoka elephant pillar.
- There is a Buddha Temple, which is said to be where Lord Buddha descended from heaven.
- Temple of Maya Devi, which has Buddhist sculptures dating back to the Mahayana period on its walls; and the Shiva Linga, a massive Shiva Linga that is also a draw for Hindu worshippers.

Lalitgiri, Odisha

- **It is a large Buddhist complex in the Indian state of Odisha that includes huge stupas, 'esoteric' Buddha statues, and monasteries (viharas), and is one of the region's oldest sites.**
- Lalitgiri is part of Puspagiri University, which is located on top of the same-named hills as Ratnagiri and Udayagiri.
- The "Diamond Triangle" refers to the three complexes.
- At this location, Tantric Buddhism was practiced.

Q52 ANSWER (b)

Explanation:

Context:

Tata Advanced Systems Limited (TASL) recently announced the successful deployment in space of its sub-metre resolution optical satellite, TSAT-1A, by SpaceX's Falcon 9 rocket.

About TSAT-1A:

- **It is an optical sub-metre-resolution Earth observation satellite.**
- It was built by Tata Advanced Systems Limited (TASL) in collaboration with Latin American company Satellogic Inc, following a collaboration agreement between the two companies in late 2023.
- TSAT-1A was assembled in TASL's Assembly, Integration, and Testing (AIT) plant at its Vemagal facility in Karnataka.
- **It was launched by SpaceX's Falcon 9 rocket from the Kennedy Space Center, Florida, in the US.**

Features:

- **TSAT-1A's core strength lies in its ability to capture military grade imagery of Earth's surface with sub-meter resolution.**
- It is equipped with both multispectral and hyperspectral imaging capabilities. This technology allows TSAT-1A to collect data across a wide range of wavelengths within the electromagnetic spectrum, providing a deeper and more nuanced understanding of land, water, and various natural resources.
- TSAT-1A boasts greater collection capacity, a wider dynamic range (the ability to capture detail in both very bright and very dark areas), and low-latency delivery of data.

This satellite will be used by Indian defence forces to gather discreet information, and this information will be shared with friendly nations.

It can enable defence forces to enhance their preparedness, response capabilities, and strategic decision-making.

While India has a few military spy satellites built by ISRO, this is the first such initiative in the private sector.

Q53 ANSWER (b)

Explanation:

Context:

Israel for the first time used a seaborne missile defence system to shoot down a drone approaching from the Red Sea that had set off sirens in the port city of Eilat, the military said on Tuesday.

More on news:

- Eilat has been a frequent target for launches by Iran-backed Houthis in Yemen as a show of support for Hamas, the Palestinian group that rules Gaza and is also backed by Iran.
- Israel positioned missile boats in the Red Sea after the start of the war in Gaza, the military said. One of those missile boats shot down the drone with the new system called the C-Dome.

About C-Dome:

- **The C-Dome is a naval variant of the Iron Dome of Israel.**
- **C-Dome, according to Israeli defence contractor Rafael, uses the same interceptors as the land-based Iron Dome that counters shorter range shorter-range rockets and drones.**
- It bookends Israel's multi-tier air defence array opposite Arrow-3, which is designed to intercept ballistic missiles outside the earth's atmosphere.

Q54 ANSWER (b)

Explanation:

- **Botswana, officially the Republic of Botswana, is a landlocked country in Southern Africa.**
- Botswana is topographically flat, with approximately 70 percent of its territory being the Kalahari Desert.
- **It is bordered by South Africa to the south and southeast, Namibia to the west and north, and Zimbabwe to the northeast.**
- **It is connected by the Kazungula Bridge to Zambia, across the world's shortest border between two countries.**

Q55. Answer (c)

Explanation:

Additional information: What is the Nagorno-Karabakh Conflict?

- Nagorno-Karabakh, known as Artsakh by Armenians, is a landlocked mountainous area in the Caucasus region (the transcontinental region between the Black Sea and the Caspian Sea).
    - It is internationally recognised as part of Azerbaijan but its inhabitants are predominantly ethnic Armenians.
    - They have their own government which has enjoyed close links to Armenia's but has not been officially recognised by Armenia or any other country.
- The conflict dates back to the late 1980s when the region declared its independence from Azerbaijan as the Soviet Union collapsed.
    - The first war erupted between Armenia and Azerbaijan over the territory, which ended with a ceasefire in 1994, leaving Nagorno-Karabakh and some surrounding areas under Armenian control.
    - The ceasefire was frequently violated by both sides, and several attempts to negotiate a peaceful settlement failed.
- In 2020, Azerbaijan launched the Second Karabakh War, winning a resounding victory and retaking seven surrounding districts and about a third of Nagorno-Karabakh.
    - Russia brokered a peace deal after the Second Karabakh War in 2020 and provided for up to 1,960 Russian peacekeepers stationed in the region.

Q56. Answer (a)

Explanation:

About Akash Weapon System:-

- AKASH is a Short Range Surface Air Missile system. Hence, Statement 1 is incorrect.
- It is a Russian-made missile system.
- It was planned and developed as part of India’s Integrated Guided-Missile Development Program (IGMDP). Hence, Statement 2 is correct.

- The Defence Research and Development Organisation (DRDO) created it, and Bharat Dynamics Limited (BDL). produced it
- It can track aeroplanes up to 50–80 kilometres away and at altitudes of 18,000 metres.
- It can destroy aerial targets such as fighter jets, cruise missiles, and air-to-surface missiles, as well as ballistic
- It is to protect vulnerable areas and vulnerable points from air attacks.
- AKASH Weapon System can simultaneously engage Multiple Targets in Group Mode or Autonomous Mode. Hence, Statement 3 is correct.
- It has built-in Electronic Counter-Counter Measures (ECCM) features.
- The entire weapon system has been configured on mobile platforms.
- AKASH Weapon Systems has been inducted and is operational with the Indian Air Force (IAF) as well as the Indian Army (IA).

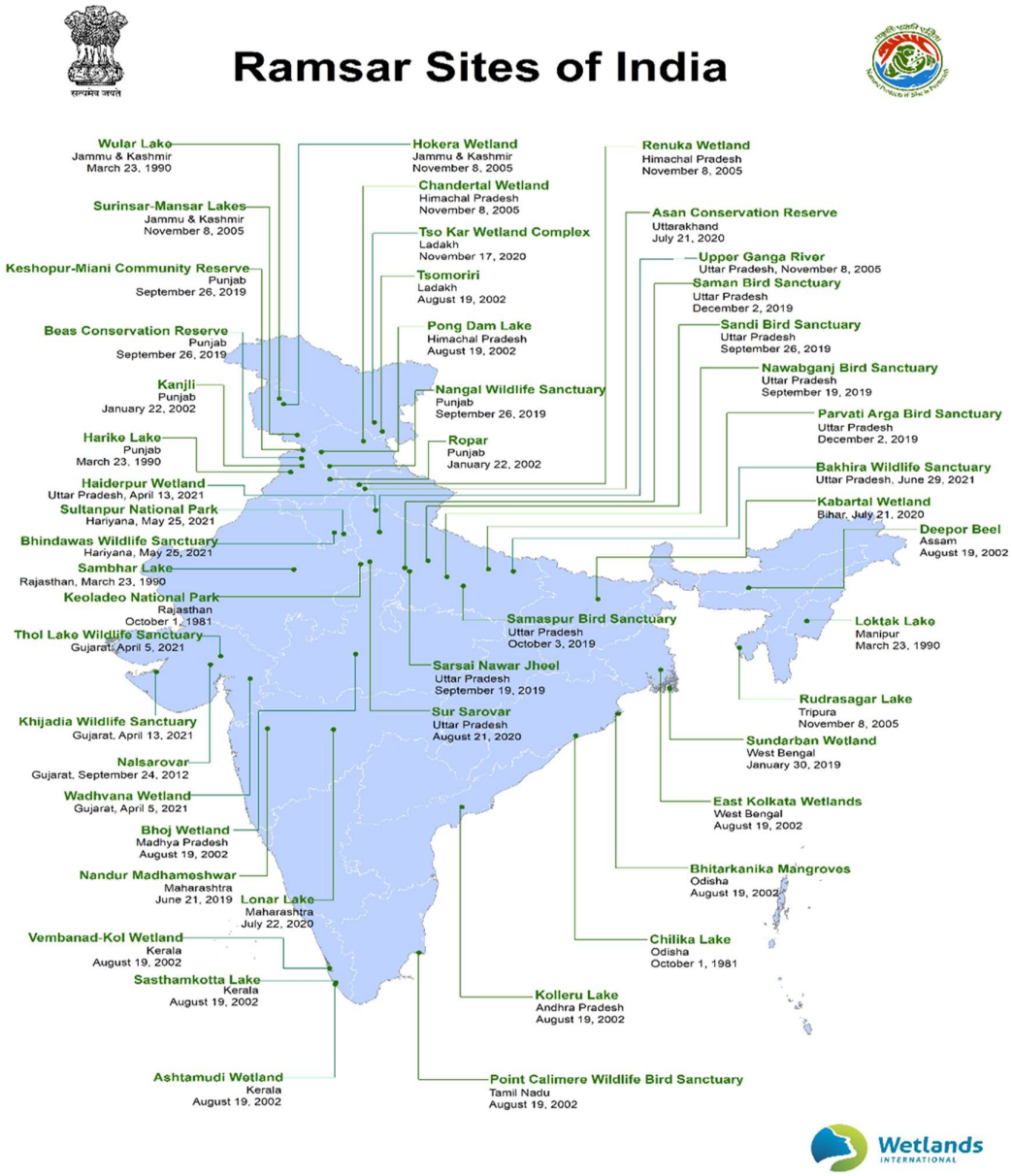
Q57. Answer (d)
Explanation:

What is Shanghai Cooperation Organization?

- About:
  - SCO is a permanent intergovernmental international organization.
  - It's a political, economic and military organization aiming to maintain peace, security and stability in the region.
  - It was created in 2001.
  - The SCO Charter was signed in 2002 and entered into force in 2003.
- Objectives:
  - Strengthening mutual trust and neighborliness among the member states.
  - Promoting effective cooperation in -politics, trade & economy, research & technology and culture.

    - Enhancing ties in education, energy, transport, tourism, environmental protection, etc.
    - Maintain and ensure peace, security and stability in the region.
    - Establishment of a democratic, fair and rational new international political & economic order.
- Structure:
    - Heads of State Council: The supreme SCO body which decides its internal functioning and its interaction with other States & international organisations, and considers international issues.
    - Heads of Government Council: Approves the budget, considers and decides upon issues related to economic spheres of interaction within SCO.
    - Council of Ministers of Foreign Affairs: Considers issues related to day-to-day activities.
    - Rats: Established to combat terrorism, separatism and extremism.
- SCO Secretariat:
    - Based in Beijing to provide informational, analytical & organizational support.
- Official language:
    - The official working language of the SCO Secretariat is Russian and Chinese.

Q.58 Answer (a)
Explanation:
Ramsar sites in India:-



About Salt Marshes:-

- These are types of wetlands.
    - Wetlands: Lands transitional between terrestrial and aquatic ecosystems where the water table is usually at or near the surface or the land is covered by shallow water.
- These are periodically saturated, flooded, or ponded with water.
- They are characterized by herbaceous (non-woody) vegetation adapted to wet soil conditions.
- They are further characterized as tidal marshes and non-tidal marshes.

Marshes are often divided into:-

Freshwater Swamps

- These are often found hundreds of kilometres from the coast.

- These are dominated by grasses and aquatic plants.
- These marshes often develop around lakes and streams.

Saltwater Marshes

- These are some of the richest ecosystems for biodiversity.
- They are dominated by grasses.
- They provide food and shelter for algae, fungi, shellfish, fish, amphibians, and reptiles.
- A few mangrove trees may dot saltwater marshes, but they are dominated by grasses and a layer of algae called an algal mat.
- This algal mat is home to many insects and amphibians.

Wetlands in India

- Globally, wetlands cover 4 percent of the geographical area of the world
- The 'Convention on Wetlands' is called the Ramsar convention.
    - It was signed in Ramsar, Iran, in 1971.
    - It is an intergovernmental treaty which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.

Q59. Answer (b)

Explanation:

About the National Disaster Response Force (NDRF):-

- It is an Indian specialized force .
- It was constituted "for the purpose of special response to a threatening disaster situation or disaster" under the Disaster Management Act, 2005. Hence, **Statement 1 is correct.**
- It comes under Ministry of Home Affairs. Hence, **Statement 2 is incorrect.**
- It is the only dedicated disaster response force in the world
- The Apex Body for Disaster Management in India is the National Disaster Management Authority (NDMA).
- The Chairman of the NDMA is the Prime Minister. Hence, **Statement 3 is incorrect.**
- The head of the NDRF is designated as Director General.
    - The Director Generals of NDRF are IPS officers on deputation from Indian police organisation.
    - Director General is a three-star officer.

Working of NDRF:-

- The responsibility of managing disasters in India is that of the State Government.
- When 'calamities of severe nature' occur, the Central Government is responsible for providing aid and assistance to the affected state, including deploying, at the State's request, of Armed Forces, Central Paramilitary Forces, National Disaster Response Force (NDRF),and such communication, air and other assets, as are available and needed.

Composition:-

- National Disaster Response Force (NDRF) is a force of 12 battalions, organized on para-military lines, and manned by persons on deputation from the para-military forces of India.
- These include:-

- three Border Security Force
- three Central Reserve Police Force
- two Central Industrial Security Force
- two Indo-Tibetan Border Police and
- two Sashastra Seema Bal.

Q60 Answer (b)
Explanation:
About

- The United Nations Environment Programme (UNEP) and UN Human Settlements Programme (UN-Habitat) established the day in response to the worsening impacts of waste on human health, the economy and the environment. Hence, **Statement 2 is correct.**
- The day calls upon all stakeholders — including governments, civil society, businesses, academia, communities, women and youth — to engage in activities that raise awareness of zero-waste initiatives.
- On 14 December 2022, the United Nations General Assembly adopted a resolution at its seventy-seventh session to proclaim **30 March as International Day of Zero Waste, to be observed annually.**

Significance

- The waste crisis is undermining the Earth's ability to sustain life. Waste costs the global economy billions of dollars each year.
- Waste generation has increased massively around the world in recent decades, and there are no signs of it slowing down. By 2050, worldwide municipal solid waste generation is expected to have increased by roughly 70 per cent to 3.4 billion tonnes.
- Promoting zero-waste initiatives can help advance all the goals and targets in the 2030 Agenda for Sustainable Development, including Sustainable Development Goal 11 on making cities and human settlements inclusive, safe, resilient and sustainable and UN-mandated Sustainable Development Goal 12 on ensuring sustainable consumption and production patterns

India's initiatives in Waste management

- The Government of India has undertaken multiple large-scale national initiatives such as 'Swachh Bharat Mission', 'National Water Mission' and 'Waste to Wealth Mission ' as a part of its commitment to effective waste & pollution management in India.
- To promote and support the goals of the Swachh Bharat Unnat Bharat Abhiyan, the Solid Waste Management (SWM) Rules 2016, Plastic Waste Management (PWM) Rules, 2016 and the E-waste (Management) Rules, 2016 have been notified.
- In February 2022, Prime Minister Shri Narendra Modi, inaugurated Asia's biggest municipal solid waste based GOBARdhan plant in Indoreaiming to generate 19,000 kg bio-CNG gas.
- Under Swachh Bharat Mission-Urban 2.0, the bio-methanation plants linked to the GOBARdhan and SATAT schemes will produce Bio-CNG as a renewable energy.

Q61. Answer (a)
Explanation:

About Dibang Wildlife Sanctuary:-

- Dibang Wildlife Sanctuary is located nearby Anini district, Arunachal Pradesh.
- It has been named after the Dibang river, a tributary of the Brahmaputra river.
- It occupies part of the Eastern Himalayas.
- Flora: the two main categories of vegetation are temperate broad-leaved forest and temperate conifer forest (Rhododendron, Bamboo, Gregaria, Tsuga etc).
    - Alpine vegetation occurs at higher altitudes with herbs, stunted trees and dwarf bushes.
- Fauna: Mishmi takin, Asiatic black bear, tigers, gongshan muntjac, red panda, red goral and musk deer.

About Idu Mishmis:-

- It is a sub-tribe of the larger Mishmi group in Arunachal Pradesh and neighbouring Tibet.
- They primarily live in Mishmi hills bordering Tibet.
- They are believed to have migrated from the Mongoloid race.
    - Mongoloid race: belong to the Tibeto-Burman family.

- Their language (also called Idu Mishmi) is considered endangered by UNESCO.
- They follow a strict belief system of myths and taboos like 'iyu-ena'.
    - Iyu-ena: restrict them from hunting many animals, including a complete prohibition on killing tigers.

Q62. Answer (a)

Explanation:

- Rare earth elements are a set of seventeen metallic elements in the periodic table. Hence, **Statement 1 is incorrect.**
- The 17 Rare Earths are cerium (Ce), dysprosium (Dy), erbium (Er), europium (Eu), gadolinium (Gd), holmium (Ho), lanthanum (La), lutetium (Lu), neodymium (Nd), praseodymium (Pr), promethium (Pm), samarium (Sm), scandium (Sc), terbium (Tb), thulium (Tm), ytterbium (Yb), and yttrium (Y).
- They are characterized by high density, high melting point, high conductivity, and high thermal conductance. Hence, **Statement 2 is correct**.
- They do not occur in a free state rather are found in mineral oxide ores.
- They occur abundantly but are often not concentrated enough to undertake viable extraction.

Uses of Rare earth elements:-

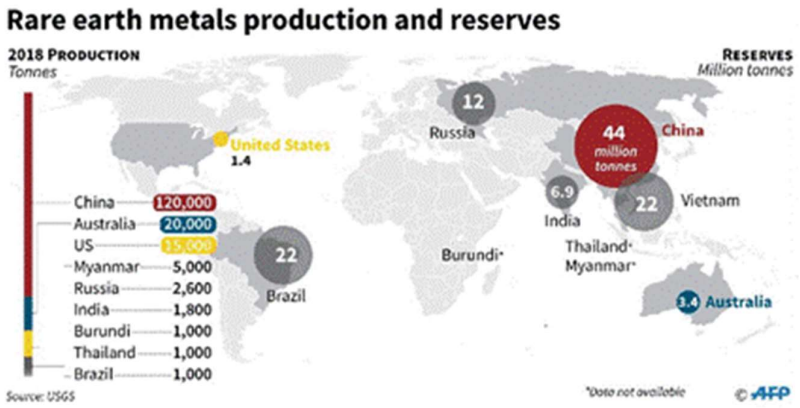
- They are widely used in high technology owing to their luminescent and catalytic properties.
- Neodymium, is a critical component for permanent.
- Aerospace and Defence: it is used in precision-guided munitions in missiles, high-power sonar on ships and submarines, stealth helicopters, etc.
- Health care: are used in medical imaging devices, such as MRIs, and modern surgical machines.
- Clean Energy: is used in wind turbines, electric car batteriesand energy-efficient lights (LEDs and CFLs).
- Nuclear Energy: these are useful for controlling nuclear reactionsand are used in control rods.
- Electronics: Used as phosphors in cathode ray tubes, fluorescent lamps and X-ray intensifying screens.
- Chemicals, Oil Refining, and manufacturing: Make the refining of crude oil into gasoline more efficient and are used in many speciality metal alloys.
- Europium is necessary for LED bulbs and colour television screens.
- Samarium is used in optical lasers.

India's situation:-

- India is almost 100% import-dependent for most rare earth.
- However, India possesses the 5th highest reserves of rare earth in the world
- In India, rare earth minerals like ilmenite, sillimanite, garnet, zircon, monazite, and rutile, collectively are found and these are called Beach Sand Minerals (BSM).

- Monazite is the principal source.
    - It is mainly found in Odisha, Andhra Pradesh, Tamil Nadu, Kerala, West Bengal, and Jharkhand.

International situation:-

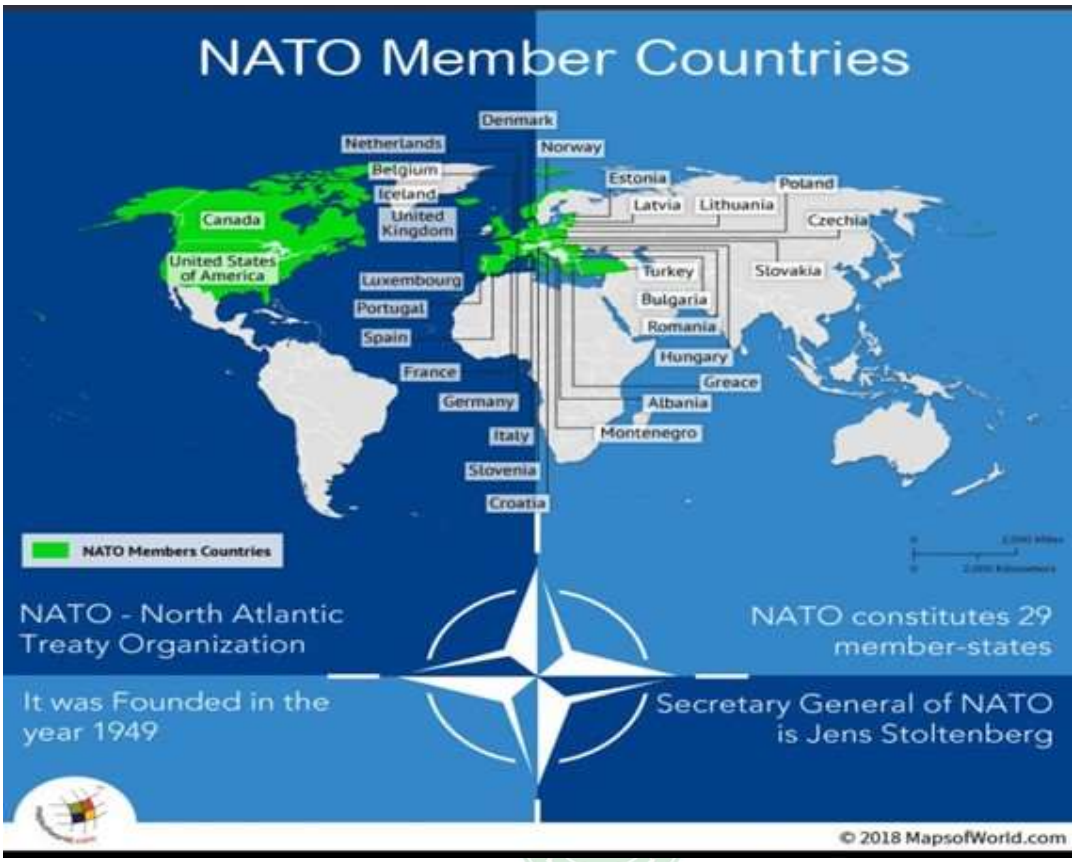


- China holds the leading position among producers of rare earth oxides.
- Other major producers are Myanmar, Australia, the USA, Russia and Malaysia.
- Concentrated/partially-processed intermediate products are further processed at many locations in Europe, the USA, Japan and China.

Q63. Answer (b)

Explanation:

About North Atlantic Treaty Organisation (NATO):-



- NATO is a Western defensive military alliance led by the United States. Hence, **Statement 1 is correct.**
- The NATO headquarters are located in Brussels, Belgium.
    - The headquarters of Allied Command Operations is near Mons, Belgium.
    - India is not a member.

Background:-

- It came into being after World War II as a counter to the Soviet Union's possible expansion attempts in Europe.
- Then-US President Harry S Truman signed the 12-member treaty on April 4, 1949.
- After the collapse of the USSR in 1991, several eastern European nations previously members of the Soviet Union joined NATO.
- It has 32 Members now:-
    - Belgium, Canada, Denmark, France, Iceland, Italy, Luxembourg, the Netherlands, Norway, Portugal, the United Kingdom, the United States, Greece, Turkey, Germany, Spain, Czechia, Hungary, Poland, Bulgaria, Estonia, Latvia, Lithuania, Romania, Slovakia, Slovenia, Albania, Croatia, Montenegro, and North Macedonia,Finland,Sweden.

Core duties:-

- It follows the collective Defence principles and routinely undertakes exercises to strengthen its territorial, naval, and air forces. Hence, **Statement 3 is correct.**
- NATO members also arm themselves to face evolving methods of attacks like cybercrimes.

- They also have participated in military operations in Bosnia and Herzegovina, Kosova, Afghanistan, Iraq, Libya and Syria, among others.

Q64. Answer (a)

Explanation:

About UN Statistical Commission:-

- The United Nations Statistical Commission was established in 1947.
- Headquarters: New York
- It is the highest body of the global statistical system bringing together the Chief Statisticians from member states from around the world. Hence, **Statement 1 is correct**.
- It is the highest decision-making body for international statistical activities, responsible for setting statistical standards and the development of concepts and methods, including their implementation at the national and international levels.
- The Statistical Commission oversees the work of the United Nations Statistics Division (UNSD), and it is a Functional Commission of the UN Economic and Social Council.
- Sessions: The 54th session of the United Nations Statistical Commission was held on 28 February – 3 March 2023.

Mandate:-

- The Statistical Commission was established by the Economic and Social Council.
- Commission shall assist the Council:-
    - In promoting the development of national statistics and the improvement of their comparability;
    - In the coordination of the statistical work of specialized agencies;
    - In the development of the central statistical services of the Secretariat

Membership:-

- The Commission consists of 24 member countries of the United Nations elected by the United Nations Economic and Social Council on the basis of an equitable geographical distribution according to the following pattern:
    - Five members from African States
    - Four members from Asia-Pacific States
    - Four members from Eastern European States
    - Four members from Latin American and Caribbean States
    - Seven members from Western European and other States
- The term of office of members is four years. Hence, **Statement 2 is incorrect.**
- India is a member. Hence, **Statement 3 is correct.**

Q65. Answer (a)

Explanation:

- The firm in question is Cognyte Software Ltd, which faces a class action lawsuit in the U.S. from investors.

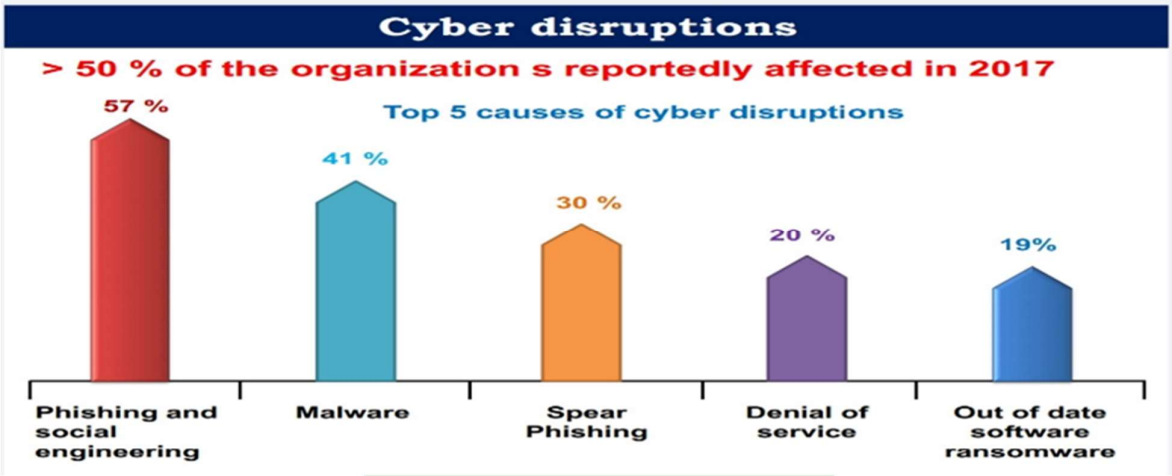
About Cybersecurity:

- Cybersecurity or information technology security are the techniques of protecting computers, networks, programs, and data from unauthorized access or attacks that are aimed for exploitation.
- Cyber security is concerned with making cyberspace safe from threats, namely cyber-threats.

Significance of Cybersecurity: The concept of cybersecurity can be applied in various contexts, from general business operations to firewall technologies, but it can be divided into a few general categories.

- Information security – to protect and secure the privacy and integrity of data at rest or at movement.
- Network security – to secure a computer network from bad actors that might be a targeted attack or malicious malware.
- Operational security – to create and maintain the processes, procedures and decision making for treatment and protecting data assets.
- Application security – to concentrate on maintaining the safety of software and devices clear of threats.
- Business continuity and disaster recovery – to decide how an organization responds to a cybersecurity incident or breach of data.
    - These are the policies and procedures that dictate how the organization re-establishes control of its operations and information to the same level prior to the event because resources may be lacking post event.
- Risk Management – to manage organizational risk in the company's information security program itself, which offers an operative framework for setting the risk appetite and security controls for systems.
- Security Awareness training – to address the education of people who often cause security vulnerabilities based on their actions or lack thereof.
    - People can unintentionally introduce a virus or malware to an otherwise secure system if they are not knowledgeable of security best practices, such as deleting suspicious attachments in emails, refrain from inserting unidentified USB drives, etc.

Reasons for increasing cyber-attacks:



- Increasing dependency on technology: As we grow faster, more and more systems are being shifted to virtual space to promote access and ease of use.
- Lack of robust law enforcement mechanisms: India's approach to cyber security has so far been ad hoc and unsystematic.
- Lack of International Coordination: International cooperation and consensus is missing in this field.
- Adverse relations with China: China is considered one of the world leaders in information technology.
    - Therefore, it is expected to have capabilities to disable or partially interrupt the information technology services in another country.

Challenges in Ensuring Cyber Security:

- Widespread digital illiteracy
- Use of Substandard devices
- Rampant use of unlicensed software and underpaid licenses also make them vulnerable.
- Lack of adoption of new technology
- Lack of uniform standards
- Import dependence
- Lack of adequate infrastructure and trained staff
- Anonymity

- Lack of coordination among various agencies working for cyber security

Government of India Initiatives:

- The Government of India (GoI) has taken several technical, institutional, and legislative steps to tackle issues related to cybersecurity, including the National Cyber Security Policy (2013) and enactment of the Information Technology (IT) Act, 2000.
- The Indian Computer Emergency Response Team (CERT-In) was founded by the Ministry of Electronics and Information Technology (MeitY) as the national bureau for event response, including evaluation, prediction and alerts for cybersecurity breaches.
- The Cyber Swachhta Kendra(Botnet Cleaning and Malware Analysis Centre) (CSK), a constituent of the Digital India initiative of the GoI under MeitY, works to create a secure cyberspace by identifying botnets.
- Cyber and Information Security (C&IS) division of Ministry of Home Affairs (MHA) deals with issues relating to Cyber Crime, Cyber Security, National Intelligence Grid (NATGRID) and National Information Security Policy & Guidelines (NISPG).
- Cyber Crime Prevention against Women and Children (CCPWC) Scheme is established by MHA to give the states/UTs financial support of USD 11.99 million for the establishment of cyber forensic-cum-training laboratories.
- National Cyber Coordination Centre (NCCC) and National Critical Information Infrastructure Protection Centre (NCIIPC) are some other initiatives undertaken by the government concerning cybersecurity.

Way Forward:

Thus, the governments, both at the state and central level as well as policymakers need to play an active role in spreading awareness and training individuals. A large part of India's population is digitally literate but unaware about basic security measures.

With the introduction of 5G and the arrival of quantum computing, the potency of malicious software, and avenues for digital security breaches would only increase. India's cybersecurity strategy would do well not to overlook these actualities and trends.

The G-20 summit this year in India is a rare opportunity to bring together domestic and international engagement groups across the spectrum, and steer the direction of these consultations.

Q66. Answer (d)

Explanation:

What is G20?

The G20 countries together account for 85% of the global GDP, over 75% of global trade, and about 2/3rd of the world population.

- It is an international forum that brings together the world's leading industrialised and emerging economies.
- Launch- Established in 1999 after the Asian financial crisis as a regular forum for Finance Ministers and Central Bank Governors.
- Aim- To study, review, and promote high level discussion of policy issues pertaining to international financial stability.

- Objectives-
    - Policy coordination between its members in order to achieve global economic stability, sustainable growth;
    - To promote financial regulationsthat reduce risks and prevent future financial crises; and
    - To create a new international financial architecture
- Member- It comprises of 19 countries (Canada, France, Germany, Italy, Japan, UK, US, Russia, Australia, Canada, Saudi Arabia, India, South Africa, Turkey, Argentina, Brazil, Mexico, China and Indonesia) and European Union.

G20	
Founded in	1999
India's membership	India is a member
Chair	India (2023)

- The group does not have permanent secretariat.
- Presidency- The President is chosen by a rotation system amongst the member countries.
    - India holds the Presidency of the G20 from December 2022 to 30 November 2023.
- Troika- It comprises of the past, present, and future presidents.
    - Troika 2023 includes Indonesia, India, and Brazil.
- Guest- Every year, the host country chooses other guests.
- Spain always participates in the G20 summits.
- Working structure-
    - Finance track- Meets 4 times in a year.
    - Sherpa track- Established after the inception of G20 Leaders' Summit in 2008. It covers non-financial issues.
    - Engagement groups- An unofficial track comprising non-government participants from each member country.

Q67 Answer (d)

Explanation:

Recently, ISRO and its partners successfully demonstrated a precise landing experiment for a Reusable Launch Vehicle at theAeronautical Test Range (ATR), Chitradurga, Karnataka.

- An Indian Air Forces (IAF) Chinook helicopter was used to drop the RLV-TD from a 4.5 km altitude and ISRO executed the landing experiment of the RLV-TD as planned.

What is ISRO's RLV Project?

- About:
  - According to ISRO, the series of experiments with the winged Reusable Launch Vehicle-Technology Demonstration (RLV-TD) are part of efforts at"developing essential technologies for a fully reusable launch vehicle to enable low-cost access to space".
  - In the future, this vehicle will be scaled up to become the first stage of India's reusable two-stage orbital (TSTO) launch vehicle.
- Features and Application:
  - ISRO's RLV-TD looks like an aircraft. It consists of a fuselage, a nose cap, double delta wings, and twin vertical tails. Hence, **Statement 1 is correct.**
  - The RLV-TD will be used to develop technologies like hypersonic flight (HEX), autonomous landing (LEX), return flight experiment (REX) and powered cruise flight. Hence, **Statement 2 is correct.**
- Significance:
  - With the costs acting as a major deterrent t o space exploration, a reusable launch vehicle is considered a low-cost, reliable, and on-demand mode of accessing space.
    - By using RLVs the cost of a launch can be reduced by nearly 80% of the present cost.
- Other Previous Experiment:
  - ISRO had earlier demonstrated the re-entry of its winged vehicle RLV-TD in the HEX mission in May 2016.
  - In HEX, the vehicle landed on a hypothetical runway over the Bay of Bengal. Precise landing on a runway was an aspect not included in the HEX mission.
    - The LEX mission achieved the final approach phase that coincided with the re-entry return flight path exhibiting an autonomous, high speed (350 kmph) landing.

Q68. Answer (c)
Explanation:

Key Points

- Geographical Location of Black Sea:
    - The Black Sea, also known as the Euxine Sea, is one of the major water bodies and a famous inlandsea of the world.
    - This marginal sea of the Atlantic Ocean, located between Eastern Europe and Western Asia.
    - It is surrounded by the Pontic, Caucasus, and Crimean Mountains in the south, east and north respectively.
    - The Turkish straits system - the Dardanelles, Bosporus and Marmara Sea - forms a transitional zone between the Mediterranean and the Black Sea.
    - The Black Sea is also connected to the Sea of Azov by the Strait of Kerch.
    - The bordering countries of Black Sea are: Russia, Ukraine, Georgia, Turkey, Bulgaria and Romania.
- Anoxic Water:
    - There is a significant absence of oxygen in the water.
    - The Black Sea happens to be the largest water body with a meromictic basin, which means the movement of water between the lower and upper layers of the sea is a rare phenomenon to find anywhere in the world.
    - The anoxic condition is also caused due to the presence of the process of eutrophication in the sea.

Q69. Answer (b)
Explanation:

What are the Key Points of Bandipur Tiger Reserve?

- About:
    - It lies in one of the richest biodiversity areas of our country representing western ghats Mountains Biogeography Zone",surrounded by mudumalai tiger reserve

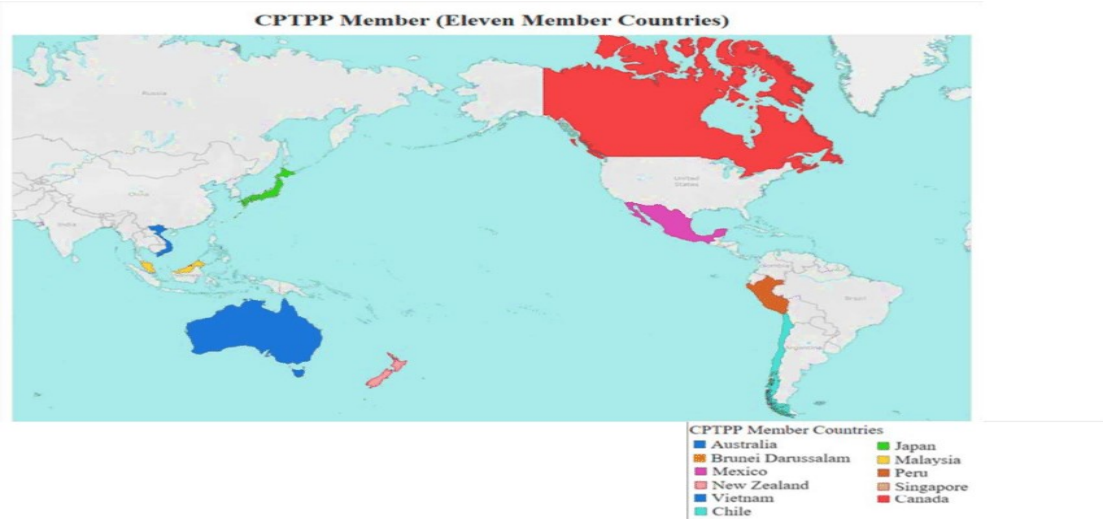
(Tamil Nadu) in the South, Wayanad wildlife sanctuary (Kerala) in the Southwest & on the North West Side the Kabini Reservoir separates the Bandipur and Nagarhole tiger reserve.
    - The reserve is recognized as one of the Mega Biodiversity Areas in the country and is home to rich floral and faunal diversity.
- Establishment:
    - It was established in 1973 under Project Tiger. In 1985, by including adjacent areas from Venugopala Wildlife Park, it was enlarged and named Bandipur National Park.
- Location:
    - It is situated in two contiguous districts (Mysore and Chamarajanagar) of Karnataka and is located at the tri-junction area of the States Karnataka, Tamil Nadu and Kerala.
- Biosphere Reserve:
    - The Bandipur Tiger Reserve is part of the Mysore Elephant Reserve and is an important component of the country's first biosphere reserve, the Nilgiri biosphere reserve.
    - The landscape spanning Bandipur, Nagarahole, Mudumalai, and Wayanad complex is home not only to the highest number of tigers in the country – about 724, but also to the largest asian elephant population.
- Rivers and the Highest Point:
    - The park is located between the Kabini river in the north and the Moyar river in the south. The Nugu river runs through the park. The highest point in the park is on a hill called Himavad Gopalaswamy Betta.
- Other Tiger Reserves in Karnataka:
    - Bhadra Tiger Reserve
    - Nagarhole tiger reserve
    - Dandeli anshi tiger reserve
    - Biligiriranganatha Swamy Temple (BRT) Tiger Reserve

Q70. Answer (a)

Explanation:

What is CPTPP?

- About:
    - The CPTPP is a FTA between Australia, Brunei Darussalam, Canada, Chile, Japan, Malaysia, Mexico, Peru, New Zealand, Singapore and Vietnam.
    - The CPTPP was signed by the 11 countries on 8 March 2018 in Santiago, Chile.



- Background:
  - In 2005, a trade agreement between a small group of Pacific Rim countries comprising Brunei, Chile, New Zealand, and Singapore led to the formation of Trans Pacific Partnership (TPP) consisting of 12 nation-states.
  - After the withdrawal of the US, the remaining eleven signatories, known as the TPP-11,continued talks and their efforts led to the formation of CPTPP.
- Significance:
  - CPTPP removes 99% of tariffs on goods and services, just like the original TPP did, all the member countries have agreed to cut down on wildlife trafficking. That helps elephants, rhinoceroses, and marine species the most.
  - It prevents environmental abuses, such as unsustainable logging and fishing. Countries that don't comply will face trade penalties.

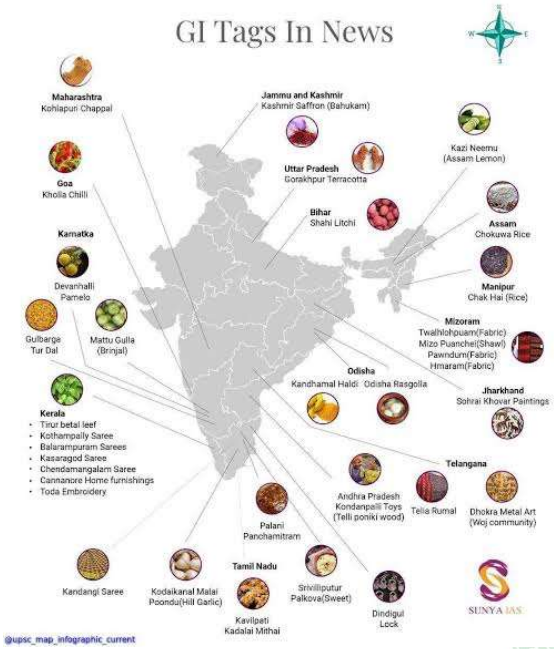
What are the Benefits of the CPTPP for the U.K.?

- More than 99% of British exports, including key markets such as cheese, cars, chocolate, machinery, gin, and whisky, will have zero tariffs.
- The deal is expected to add GBP 1.8 billion (USD 2.2 billion) annually to the U.K. economy in the long run, a modest boost of 0.08% to GDP.
- The CPTPP is a "gateway" to the Indo- pacific region which is expected to account for a majority (54%) of global economic growth in the future.
- As a CPTPP member, the U.K. will have a veto on whether China joins the treaty. U.K. firms will not need to establish a local office or be resident to provide services and will be able to operate on a par with firms in host countries.

What is India's stand on CPTPP?

- India did not join as it seeks to place greater labor and environmental standards on its other partners and CPTPP draft includes narrowly detailed qualifications on standards for investment protection, provisions to protect the host state’s right to regulate, and the imposition of detailed transparency requirements. Hence, Statement 1 and 2 are correct.

Q71. Answer (d)
Explanation:



What is a Geographical Indication (GI) tag Tag?

- About:
  - A GI tag is a name or sign used on certain products that correspond to a specific geographical location or origin.
  - The GI tag ensures that only the authorised users or those residing in the geographical territory are allowed to use the popular product name.
    - It also protects the product from being copied or imitated by others.
  - A registered GI is valid for 10 years.
  - GI registration is overseen by the Department for Promotion of Industry and Internal Trade under the Ministry of Commerce and Industry.
- Legal Framework and Obligations:
  - The Geographical Indications of Goods (Registration and Protection) Act, 1999 seeks to provide for the registration and better protection of geographical indications relating to goods in India.
  - It is governed and directed by the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS).
    - Furthermore, the significance of protecting industrial property and geographical indications as integral components of intellectual property is acknowledged and emphasised in Articles 1(2) and 10 of the Paris Convention.

About Kangra tea:-

- In 1849, Dr Jameson, then superintendent of the Botanical Tea Gardens, pronounced the region ideal for tea cultivation.
- Being one of India's smallest tea regions makes Kangra green and black tea all the more exclusive.
- While the black tea has a sweet lingering aftertaste, the green tea has a delicate woody aroma.
- It is hand-plucked and processedwith traditional methods to bring out its full potential.
- It is exported to Kabul and Central Asia via Peshawar.
- Kangra tea is a registered Geographical Indication (GI).
- Tea Attributes: The first flush of Kangra tea is known for its quality, unique aroma and tinge of fruity flavour.
- A little milder than Darjeeling tea in terms of flavour.
- It has more body and liquor.
- Elevation: Teas are grown at elevations ranging from 900 to 1400 metres above sea level.
- Annual Rainfall: 270 to 350cm.

Q72. Answer (b)

Explanation:

About Mahila Samman Savings Certificate (MSSC) 2023:-

- It is a one-time small savings scheme for women to commemorate celebrations of 75 years of Independence. Hence, Statement 1 is correct.
- It will be made available for a two-year period up to March 2025. Hence, Statement 2 is incorrect.
- It will be under the Ministry of Women and Child Development.
- The small saving certificate will have a fixed interest rate of 7.5% for two years.
- The deposit can be made in the name of a woman or a girl child.
- The maximum deposit amount has been kept at ₹2 lakhs and the scheme will have a partial withdrawal facility as well.

Eligibility:-

- Application for opening an account under the scheme can be made by a woman for herself or by the guardian on behalf of a minor girl.

Deposit limit:-

- Any number of MSSC accounts can be opened by a woman, or in the name of a minor girl by the guardian, subject to the maximum limit of Rs 2 lakh.

Interest Rate:-

- The Government has notified 7.5% interest on deposits in an MSSC account.
- The interest will be compounded on a quarterly basis and credited to the account.

Maturity and Payment:-

- The notification said that the deposit shall mature on completion of two years from the date of the deposit.
- The eligible balance may be paid to the account holder on an application in Form-2 submitted to the accounts office on maturity.

Partial Withdrawal:-

- An MSSC accountholder will be allowed to withdraw a maximum of up to 40% of the eligible balance once after the expiry of one year from the date of opening of the account but before the maturity of the account.
- The notification further said that in case of an account opened on behalf of a minor girl, the guardian may apply for the withdrawal for the benefit

Q73. Answer (a)
Explanation:

About nuclear reactors: A class of devices that contain and control sustained nuclear chain reactions, these systems are at the heart of any nuclear power plant.

Nuclear Reactor in Earth orbit:

• The U.S.' first and only known space nuclear reactor, the SNAP-10A was the result of the government-sponsored System for Nuclear Auxiliary Power (SNAP) programme, also known as SNAPSHOT for Space Nuclear Auxiliary Power Shot.

• The SNAP reactors had liquid sodium-potassium alloy as the coolant. A thermoelectric enriched uranium fuel with zirconium hydride as a moderator converter was used to directly convert heat from the reactor into electricity.

• Russia has sent quite a few of them, including one that crashed and scattered radioactive debris over Canada in 1978.

Q74. Answer (b)
Explanation:

Key Points

- Properties of Lithium:
  - It is a chemical element with the symbol Li.
  - It is a soft, silvery-white metal.
  - Under standard conditions, it is the lightest metal and the lightest solid element.
  - It is highly reactive and flammable, and must be stored in mineral oil.
  - It is an alkali metal and a rare metal.
    - The alkali metals consist of the chemical elements lithium, sodium, potassium, rubidium, caesium, and francium. Together with hydrogen they constitute group 1, which lies in the s-block of the periodic table.
    - Rare Metals (RM) include Niobium (Nb), Tantalum (Ta), Lithium (Li), Beryllium (Be), Cesium (Cs) etc. and Rare Earths (RE) include Lanthanum (La) to Lutetium (Lu) besides Scandium (Sc) and Yttrium (Y).
    - These metals are strategic in nature with wide application in the nuclear and other high tech industries such as electronics, telecommunication, information technology, space, defense etc.
- Uses:
    - Lithium metal is used to make useful alloys. For example, with lead to make 'white metal' bearings for motor engines, with aluminium to make aircraft parts, and with magnesium to make armour plates.
  - In Thermonuclear reactions.
  - To make electrochemical cells. Lithium is an important component in electric vehicles, Laptops etc.

- Countries with Largest Reserves:
    - Chile> Australia> Argentina
- Lithium in India:
    - Researchers at the Atomic Minerals Directorate (under India's Atomic Energy Commission) have estimated lithium reserves of 14,100 tonnes in a small patch of land surveyed in southern Karnataka's mandya district recently.
        - Also to be India's first ever Lithium deposit site found.
- Other Potential Sites in India:
    - The major mica belts in Rajasthan, Bihar, and Andhra Pradesh.
    - Pegmatite (igneous rocks) belts in Odisha and Chhattisgarh.
    - Brines of Sambhar and Pachpadra in Rajasthan, and Rann of Kachchh in Gujarat.
- Related Government Initiative:
    - India, through a newly state-owned companyKhanij Bidesh India Ltd, had signed an agreement with an Argentinian firm to jointly prospect lithium in Argentina.
        - Khanij Bidesh India Ltd has a specific mandate to acquire strategic mineral assets such as lithium and cobalt abroad.

Q75 Answer (a)

Explanation:

About Eravikulam National Park:-

- It is located in the Eravikulam and Idukki districts of Kerala.
- It is located in the High Ranges (Kannan Devan Hills).
- It hosts South India's highest peak, Anamudi.
- It is famous for Nilgiri tahr.
- Another speciality of Eravikulam national park is the Neelakurinji flower that blooms every 12 years.
- In 1975 the government declared the region as Eravikulam Wildlife Sanctuary.
- In 1978 the region was declared a National park.
- Vegetation: Grasslands, Shrub Land, and Shola Forests are the three major plant species present.
- It serves as a catchment area for both east-flowing rivers (tributaries of the Pambar) and west-flowing rivers (tributaries of the Periyar and Chalakkudy).
- Fauna: Lion-tailed macaques, Indian muntjac, gaur and sambar deer are the other animals found in the national park.

- Flora: The Park contains three major types of plant communities namely grasslands, shrublands, and woods.

About Ferns:-

- A fern is a member of a group of vascular plants.
    - Vascular plants: plants with xylem and phloem.
- They reproduce via spores.
- They have neither seeds nor flowers.
- They have specialized tissues that conduct water and nutrients and in having life cycles in which the sporophyte is the dominant phase.
- They have complex leaves called megaphylls.

Significance:-

- They are used for food, medicine, and as biofertilizers.
- They are used as ornamental plants and for remediating contaminated soil.
- They have been the subject of research for their ability to remove some chemical pollutants from the atmosphere.
- Some fern species, such as bracken (Pteridiumaquilinum) and water fern (Azollafiliculoides) are significant weeds worldwide.
- Some fern genera, such as Azolla, can fix nitrogen and make a significant input to the nitrogen nutrition of rice paddies.
- They also play certain roles in folklore.

Q76. Answer (a)

Explanation:

About GSAT-7B satellite:-

- It is a communication satellite. Hence, **Statement 1 is incorrect.**
- It is a part of the GSAT-7 series.
- It is the first-ever in the five-tonne category that will be designed indigenously by the ISRO.
- GSAT 7 series satellites are advanced communication satellites developed by the Indian Space Research Organisation (ISRO) to meet the communication needs of the defence services.
- The GSAT 7B will primarily fulfil the communication needs of the Indian Army.
- It is a geostationary satellite. Hence**, Statement 2 is correct.**
- It will considerably enhance the communication capability of the Indian Army.

Q77. Answer (c)

Explanation:

- The NPCI has recently introduced interchange fees of up to 1.1 per cent on merchant UPI transactions done using prepaid payment instruments (PPIs) from April 1, 2023.

Key highlights of the changes:

Applicability:

- The new NPCI guidelines on wallet interoperability establish interchange fee for wallet usage, which will be paid to issuers of wallets such as Paytm, PhonePe and Google Pay, among others.
- They also include charges for UPI-wallet-loading that will be paid by wallet issuers to remitter banks or the bank accounts from which the amount is being debited.

Benefit for wallet players:

- The inter-operability norms will enable universal acceptance of wallets across all UPI QR codes and devices, thus increasing the salience or relevance of wallets.
- It will also ensure uniformity and parity by clearly defining the interchange fees on wallet payments as against the current practice of bilateral agreements between wallet issuers and payment platforms.

Interchange fees:

- The interchange rates vary according to merchant category codes, in the range of 0.5 per cent to 1.1 per cent.
- Categories such as fuel, education, agriculture and utility payments attract a lower interchange of 0.5-0.7 per cent; convenience stores across food shops, specialty retail outlets and contractors, have the highest charge of 1.1 per cent.

Wallet transactions:

- The interchange fees are paid by merchants to wallets or card issuers and are usually absorbed by merchants.
- Smaller merchants and shopkeepers are unlikely to be impacted as it is applicable only on payments of over Rs. 2,000.
- MDR or merchant discount rate is applicable on wallets-on-UPI in certain cases and this move may lead to higher MDRs imposed on merchants, depending on payment companies' ability and willingness to pass on the interchange.

Impact on Customers:

- The norms are expected to increase the appeal, scope, role and usability of wallets as they can now be used to make UPI payments across QR codes and devices, increasing payments alternatives for customers.
- Consumers will also be able to load their wallets from anywhere including credit or debit cards, BNPL (Buy Now Pay Later) and net banking, among others, thus creating a mechanism to use any instruments for UPI transactions, albeit directly or indirectly.
- Currently, MDR for bank-to-bank UPI transactions is zero.

About Prepaid Payment Instruments (PPIs):

- PPIs are instruments that facilitate purchase of goods and services, conduct of financial services, enable remittance facilities, etc., against the value stored therein. Hence, **Statement 1 is correct.**
- Prepaid payment instruments' examples include smart cards, online accounts, online wallets, stripe cards, paper vouchers, etc. Hence, **Statement 2 is correct.**

- The primary objective of these instruments is to get access to the amount already prepaid.
    - So, one can purchase the required goods without any physical exchange of cash or card.

Digital Transactions in India

- Ministry of Electronics & Information Technology (MeitY),Digital Economy & Digital Payment Division has been entrusted with the responsibility of leading this initiative on "Promotion of Digital Transactions including Digital Payments".
- MeitY is coordinating with multiple stakeholders including Banks, Payment Service Providers, Central Ministries/Departments and States/UTs, for promotion of digital payments across the country.
- Major digital payment modes:Bharat Interface for Money-Unified Payments Interface (BHIM-UPI), Immediate Payment Service (IMPS), and National Electronic Toll Collection (NETC) have undergone significant growth in the last five years.

Q78. Answer (d)

Explanation:

Joint Exercises conducted by Army:

S. No.	Country	Exercise	Year
1.	Australia	Ex AUSTRA HIND	2016-17, 2017-18
2.	Bangladesh	Ex SAMPRITI	2015-16, 2016-17, 2017-18
3.	China	Ex HAND IN HAND	2015-16, 2016-17
4.	France	Ex SHAKTI	2015-16, , 2017-18
5.	Indonesia	Ex GARUDA SHAKTI	2015-16, 2016-17, 2017-18
6.	Kazakhstan	Ex PRABAL DOSTYK	2016-17, 2017-18
7.	Kyrgyzstan	Ex KHANJAR	2015-16, 2016-17, 2017-18
8.	Maldives	Ex EKUVERIN	2015-16, 2016-17, 2017-18
9.	Mongolia	Ex NOMADIC ELEPHANT	2015-16, 2016-17, 2017-18
10.	Myanmar	IMBEX	2017-18
11.	Nepal	Ex SURYA KIRAN	2015-16, 2016-17, 2017-18
12.	Oman	AL NAGAH	2016-17
13.	Russia	Ex INDRA	2015-16, 2016-17, 2017-18
14.	Seychelles	Ex LAMITIYE	2015-16, 2017-18
15.	Sri Lanka	Ex MITRA SHAKTI	2015-16, 2016-17, 2017-18
16.	Thailand	Ex MAITREE	2015-16, 2016-17, 2017-18
17.	UK	Ex AJEYA WARRIOR	2015-16, 2017-18
18.	USA	Ex YUDHABHAYAS	2015-16, 2016-17, 2017-18
		Ex VAJRA PRAHAR	2015-16, 2016-17, 2017-18
19.	Vietnam	VINBAX	2017-18
20.	Multinational (ADMM Plus)	Ex FORCE 18	2015-16

Q79. Answer (d)

Explanation:

What is the Project?

- About:
  - The project, which started in 2015, is being implemented jointly by the Forest Department and the (BNHS).
  - The nursery at Asola Bhatti Wildlife Sanctuary is growing more than 100 species of native grasses, plants, and trees, and provides saplings for plantation by agencies in the city.
- Aim:
  - The aim of the seed bank is to supply native saplings for the city and reintroduce species that have become rare or hard to locate. Hence, **Statement 3 is correct.**
  - The seed bank also aims to create awareness around the trees that are disappearing in Delhi, have these trees available for people to be able to grow them, and map where they are.
  - The plan is to raise production to around 10 lakh saplings every year.

What is Seed Bank?

- About:
  - Seed banks are important repositories of plant genetic resources. Hence, **Statement 1 is correct.**
  - They store seeds of different plant varieties, which are conserved to maintain their genetic diversity and to preserve their ability to adapt to changing environmental conditions. Hence, **Statement 2 is correct**.
  - Seed banks also serve as important resources for research, agriculture, and conservation.
- India's Seed Bank:
  - India has established its own seed storage facility at Chang La in Ladakh, Jammu and Kashmir.
    - It has been built jointly by the Defence Institute of High-Altitude Research (DIHAR) and the National Bureau of Plant Genetic Resources (NBPGR) in 2010 under the aegis of Defence Research and Development Organisation (DRDO).
    - It stores over 5,000 seed accessions (one accession consists of a set of seeds of a particular species collected from different geographical and demographic locations).
- World's Largest Seed Vault:
  - Svalbard Global Seed Vault or Doomsday Vault is the world's largest seed storage facility situated at Norway.

Asola-Bhatti Wildlife Sanctuary

- Asola-Bhatti Wildlife Sanctuary covering 32.71 sq. km area on the Southern Delhi Ridge of Aravalli hill range on Delhi-Haryana border lies in Southern Delhi as well as northern parts of Faridabad and Gurugram districts of Haryana state.
- It is also part of the Sariska-Delhi Wildlife Corridor, which runs from the Sariska Tiger Reserve in Rajasthan to Delhi Ridge.

Q80. Answer (c)

Explanation:

What are the Key Points Related to the Discovery?

- About: It belongs to the skipper butterfly family of Lepidoptera (moths and butterflies).
    - It is the first documented subspecies of the Bromus swift (Caltoris bromus) butterfly in the western ghats and Peninsular India.
- Number of Butterfly Species: The discovery of Caltoris bromus sadasiva brings the count of butterfly species in the Western Ghats to 336 and the count of skipper butterflies to 83, with the last skipper butterfly discovery being almost 75 years ago.
- Caltoris: Caltoris, an Indo-Australian genus has over 15 species distributed across south-east Asia. Caltoris bromus, one of them, has two other subspecies Caltoris bromus bromus and Caltoris bromus yanuca.

What are the Key Facts about Vembanad Lakes?

- This is the largest lake in Kerala and the longest Lake in India.
- Vembanad Lake is also known as Vembanad Kayal, Vembanad Kol, Punnamada Lake (in Kuttanad) and Kochi Lake (in Kochi).
- The lake has its source in four rivers, Meenachil, Achankovil, Pampa and Manimala.
- It is separated from the Arabian Sea by a narrow barrier island and is a popular backwater stretch in Kerala.
- In 2002, it was included in the list of wetlands of international importance, as defined by theRamsar Convention.
    - It is the second-largest Ramsar sites in India only after the Sundarbans in West Bengal.

Q81. Answer (d)

Explanation:

About Nagri Dubraj Rice:-

- It is known as the Basmati of Chhattisgarh because of its fragrance.
- It is produced by a women's self-help group "Maa Durga Swasahayata Samuh".
- The grain finds reference in Valmiki Ramayana.
- It is an indigenous variety and has small grains, is very soft to eat after cooking.

About Basohli Painting:-

- Basohli painting belongs to the Kathua district of Jammu.
- It belongs to the Pahari School of Paintings.
- It has a unique style of miniature paintings that have a fusion of mythology and traditional folk art.
- The characteristic features of these paintings were the use of bright and bold colours like red, yellow, and blue in the borders, as well as for the generally flat background.
- The other distinguishing part was the facial features- a prominent nose and lotus-shaped eyes.
- The female figures can be categorised into three typesaccording to their attire.

About Banarasi Paan:-

- It is made in Banaras, UP.
- It is known for its delicious taste.
- It is made using special ingredients in a unique way.
- It is an exotic combination of areca nuts, catechu (kattha) of fresh betel leaf, tobacco, and slaked lime.
- Other ingredients like rose petals (gulkand), silver foil (Parekh) etc.are added to it.

About Langda mango:-

- Langra aam is believed to have originated in Banaras (now Varanasi).
- It maintains its green colour after it gets ripe, while other mangoes change into yellow-reddish colour.

- This pulpy fruit is cultivated in mid-season in states including Uttar Pradesh, Bihar, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Madhya Pradesh, Orissa, Punjab, West Bengal and Rajasthan

About GI Tag:-

- It is used for products which have specific geographical origins or have qualities that can be attributed specifically to the region.
- The GI tags are issued as per the Geographical Indications of Goods (Registration and Protection) Act, of 1999.
- It is a part of the intellectual property rights that comes under the Paris Convention for the Protection of Industrial Property.
- This tag is valid for a period of 10 years following which it can be renewed.

Q82. Answer (a)

Explanation:

About Amogha-III:-

- Amogha-III is an indigenous missile.
- It is developed under the Integrated Guided Missile Development Programme (IGMDP).
- It has a fire-and-forget capability.
    - Fire-and-forget capability:meaning it does not require external intervention after launch.
- The missile features dual-mode Imaging Infra-Red (IIR) Seeker systems with a range of 200 to 2500 meters.
- It showcases a tandem warhead, consisting of two separate explosive charges that are detonated in sequence.
- The first charge, known as the precursor charge, penetrates the target's armour, creating a hole.
- The second charge or the main charge then detonates inside,maximizing damage inflicted on the target.
- One of the unique features of the missile is it has both top and direct attack modes.

Q83. Answer (d)

Explanation:

About The National Financial Reporting Authority (NFRA):-

- It was constituted in 2018 under section 132 (1) of the Companies Act, 2013.
- It is an independent regulator.
- It works under the Ministry of Corporate Affairs. Hence, **Statement 1 is correct**.
- Objective: to continuously improve the quality of all corporate financial reporting in India. Hence, **Statement 2 is correct.**

Composition:-

- Chairperson: a Chartered Accountant and a person of eminence having expertise in accountancy, auditing, finance or the law (appointed by the Central Government) and a maximum of 15 members.

Functions and Duties:-

- It recommends accounting and auditing policies and standards to be adopted by companies for approval by the Central Government. Hence, **Statement 3 is correct.**
- It monitors and enforcescompliance with accounting standards and auditing standards
- It oversees the quality of serviceof the professions associated with ensuring compliance with such standards and suggests measures for improvement in the quality of service.

Powers:-

- It has the same powers as the Civil Court.
    - To debar the member/firm from practice as a member of ICAI between 6 months to 10 years as may be decided.
    - To investigate matters of professional or other misconduct.

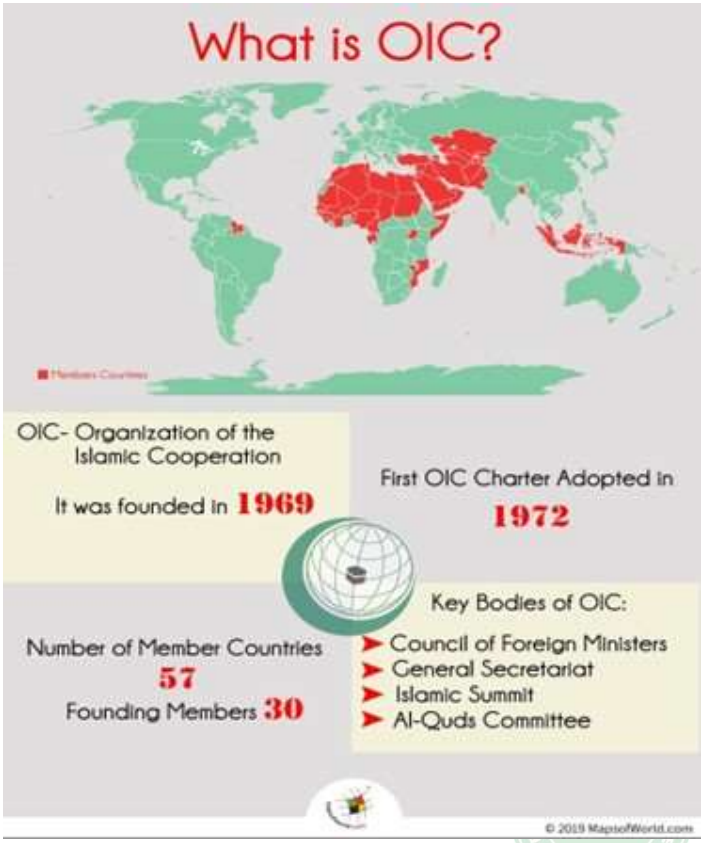
Jurisdiction:-

- Companies listed in India
- Unlisted Companies whose:
    - Net worth ≥ Rs. 500 crore; or
    - Paid up Capital ≥ Rs. 500 crore; or
    - Annual turnover ≥ Rs. 1000 crore (As on 31st March of the preceding financial year); OR
- Companies whose securities are listed outside India.

Q84. Answer (b)

Explanation:

About the Organisation of Islamic Cooperation (OIC):-



- It was established upon a decision of the historical summit which took place in Rabat, Kingdom of Morocco in 1969.
- Headquarters: Jeddah, Saudi Arabia.
- It is the second largest intergovernmental organization after the United Nations (UN). Hence, **Statement 1 is correct**.
- It has a membership of 57 states. Hence**, Statement 2 is correct**.
- Objectives:-
    - It is the collective voice of the Muslim world.
    - It endeavours to safeguard and protect the interests of the Muslim world.
    - It aims to promote international peace and harmony among various people of the world.
- India is not a member of the OIC. Hence, **Statement 3 is incorrect.**

Q85. Answer (b)

Explanation:

What is OPEC+?

- OPEC: Established in 1960 by founding members Iran, Iraq, Kuwait, Saudi Arabia and Venezuela, OPEC has since expanded and now has 13 member states.
    - Member countries are: Algeria, Angola, Congo, Equatorial Guinea, Gabon, Iran, Iraq, Kuwait, Libya, Nigeria, Saudi Arabia, United Arab Emirates, Venezuela.

        - Headquarter: Vienna, Austria.
    - OPEC produces about 40% of the world's crude oil and its members' exports make up around 60% of global petroleum trade.
- OPEC+: In 2016, with the addition of another 10 allied major oil-producing countries, the OPEC is known as OPEC+.
    - OPEC+ countries include 13 OPEC member countries and Azerbaijan, Bahrain, Brunei, Kazakhstan, Malaysia, Mexico, Oman, Russia, South Sudan and Sudan.
- Objective:
    - The objective of the organisation is to"coordinate and unify the petroleum policies of its Member Countries and ensure the stabilisation of oil markets in order to secure an efficient, economic and regular supply of petroleum to consumers, a steady income to producers and a fair return on capital for those investing in the petroleum industry.

Q86. Answer (d)

Explanation:

What is the Subansiri Lower Hydroelectric Project?

- About SLHEP:
    - SLHEP is an under-construction gravity dam(nearly 90% of the work completed) with capacity 2000 MW (8x250 MW).
    - It is the biggest hydroelectric project undertaken in India so far and is a run of river scheme on river Subansiri.
        - A run-of-river dam is one in which the flow of water in the river downstream of the dam is the same as the flow of water upstream of the dam.
        - In other words, the dam doesn't hold back/store water behind it; it runs with the river.
    - The construction of SLHEP is being undertaken by National Hydroelectric Power Corporation (NHPC) Limited.
- About Subansiri River:
    - Subansiri, or "Gold River" is the largest tributary of the Upper brahmaputra river.

    - It originates from the Tibetan Himalayas and makes its way to India via (Miri Hills) Arunachal Pradesh.
- Controversy regarding SLHEP: The project had been kept pending due to local agitation over several dam safety and administrative issuesinvolved in the implementation of the project like:
    - SLHEP contravenes the 1980 Brahmaputra Board Act by transferring the work of Water Resources Department of Subansiri Basin from the Brahmaputra Board to the public and private sector.
    - As assessed by IIT-Roorkee, there is also the issue of increased seismic threat levels to the dam.

Q87. Answer (a)
Explanation:

About World Energy Transitions Outlook report:-

- It is taken out by International Renewable Energy Agency (IRENA).
- The World Energy Transitions Outlook outlines a vision for the transition of the energy landscape to meet the goals of the Paris Agreement.
- It presents a pathway for limiting global temperature rise to within 1.5°C of pre-industrial levels and bringing CO2 emissions to net zero by mid-century.
- It outlook charts an evolving pathway to achieving a climate-safe future in line with the goals of the Paris Agreement.
- Its 1.5°C pathway offers a roadmap for accelerating the global energy transition by positioning electrification and efficiency as key drivers of change, backed by renewables, hydrogen and sustainable biomass.
- This Preview presents high-level insights from the forthcoming 2023 report, which builds on two of IRENA's key scenarios to capture global progress toward meeting the 1.5°C climate goal: the Planned Energy Scenario (PES) and the 1.5°C Scenario.
- International Renewable Energy Agency (IRENA):-
    - It is an intergovernmental organisation.
    - It was officially founded in Bonn, Germany, in 2009.
    - It has 167 members and India is the 77th Founding Member of IRENA.
    - It has its headquarters in Abu Dhabi, United Arab Emirates.

Q88. Answer (d)

Explanation:

About India Justice Report 2022:-

- It was initiated by Tata Trusts in 2019. Hence, **Statement 1 is correct**.
- This is the third edition.

- The foundation's partners include the Centre for Social Justice, Common Cause, Commonwealth Human Rights Initiative, DAKSH, TISS-Prayas, Vidhi Centre for Legal Policy and How India Lives, IJR's data partner.
- This report is based on overall data of 4 pillars of justice delivery namely Police, Judiciary, Prisons, and Legal Aid. Hence, **Statement 2 is correct.**
- It also separately assesses the capacity of the 25 State Human Rights Commissions in the country.

Findings of the report:-

Few number of judges:

- High courts: As of December 2022, against a sanctioned strength of 1,108 judges, the High Courts were functioning with only 778 judges.
- Subordinate courts: The subordinate courts were found functioning with 19,288 judges against a sanctioned strength of 24,631 judges.

Rising pendency:

- The number of cases pending per judge is rising in most States over the past five years.
- At High Court level: Uttar Pradesh has the highest average pendency – cases remain pending for an average of 11.34 years,
    - West Bengal for 9.9 years.
    - The lowest average High Court pendency is in Tripura (1 year), Sikkim (1.9 years) and Meghalaya (2.1 years).

Number of cases per judge:

- The number of cases a judge has to deal with has steadily increased.
- Between 2018 and 2022, the caseload per judge increased in 22 States and Union Territories.

Case clearance rate:

- The case clearance rate (CCR), or the number of cases disposed of in a year measured against the number filed in that year, is a common metric used to determine the rate at which cases are disposed of.
- The report found that the High Courts are clearing more cases annually than the subordinate courts.
- Between 2018-19 and 2022, the national average improved by six percentage points (88.5% to 94.6%) in High Courts, but declined by 3.6 points in lower courts (93% to 89.4%).
- Tripura is the only State where the CCR in district courts remained above 100%, with the exception of 2020 — the year of the pandemic.

Number of court halls:

- Nationally, the number of court halls appears sufficient for the number of actual judges.
- However, that space will become a problem if all the sanctioned posts are filled.

Caste based reservation:

- Though caste-based reservations vary from State to State, at the district court level, no State or Union Territory could fully meet all its Scheduled Castes, Scheduled Tribes, and Other Backward Classes quotas.
- State-wise data on caste diversity in High Courts remains unavailable.

Representation of Women:

- There are more women judges at the district court level than at the High Court level, with 35% of the total number of judges at the district court level and only 13% of judges in the High Courts across the country being women.
- Goa, with 70%, has the highest percentage of women judges at subordinate courts, followed by Meghalaya and Nagaland at 63% each.
- Among the High Courts, Sikkim, with a total strength of just three judges, has the highest national average at 33.3% of women judges.
- Bihar, Tripura, Manipur, Meghalaya, and Uttarakhand Continued to have no women judges in their High Courts.

Q89. Answer (c)

Explanation:

About International Conference on Disaster Resilient Infrastructure 2023:-

- It is the annual conference of the Coalition for Disaster Resilient Infrastructure (CDRI) and its partners. Hence, **Statement 1 is correct.**
- International Conference on Disaster Resilient Infrastructure 2023 is being hosted by India. Hence, **Statement 2 is correct.**
- The Coalition for Disaster Resilient Infrastructure (CDRI):-
    - It is a multi-stakeholder global partnership of national governments, UN (United Nations) agencies and programmes, multilateral development banks and financing mechanisms, the private sector, and knowledge institutions.
    - The Prime Minister of India launched CDRI during his speech at the UN Climate Action Summit in 2019.
    - It aims to promote the resilience of new and existing infrastructure systems to climate and disaster risks in support of sustainable development.
    - Members: 30 countries and 8 organizations.
    - The CDRI Secretariat is based in New Delhi, India.
- It brings together member Countries, organizations, institutions and infrastructure actors and stakeholders to strengthen the global discourse on disaster and climate-resilient infrastructure. Hence, **Statement 3 is correct.**
- The ICDRI 2023 will focus on charting these solutions and pathways to Shaping Resilient Infrastructure.
- It aims at delving into practices of creating risk-informed systems, resilient infrastructure assets and innovative financing to deliver infrastructure needs.
- The conference will feature the progress of the Biennial Report on Global Infrastructure Resilience, the collaborative delivery mechanism of IRIS with SIDS, and the operationalization of IRAF.
    - IRAF: multi-partner trust fund for DRI, and feature the launch of the DRI Academic Network and Partnership.

Objectives of ICDRI 2023 are:-

- To provide a platform for Member Countries to engage and contribute to DRI solution pathways.
- To bring together infrastructure actors for building partnerships, knowledge sharing and fostering complementarity on DRI solutions.
- To convene DRI stakeholders for enhanced collective action on infrastructure resilience.

Thematic Focus:-

- Pillar 1: Delivering Resilient Infrastructure
    - Inclusive and Risk-Informed Systems
- Pillar 2: Delivering Resilient Infrastructure
    - Providing Reliable Services through Resilient Infrastructure Assets
- Pillar 3: Delivering Resilient Infrastructure
    - Realising Finance and Investments for Infrastructure Resilience

Q90. Answer (d)

Explanation:

About Netravali Wildlife Sanctuary:-

- It is located in South Eastern Goa.
- Netravali Wildlife Sanctuary is the largest sanctuary in Goa and probably the most bio-diverse.
- It constitutes one of the vital corridors of the Western Ghats.
- Netravali or Neturli is an important tributary of River Zuari, which originates in the sanctuary.
- It has two important waterfalls namely, Savari and Mainapi.
- It has some of the finest yet relatively unexplored forests in the state.
- The typical forest here is mixed deciduous to semi-evergreen with a good network of streams and tabletop grasslands.
- Fauna: Leopard, Giant Squirrel, Mouse Deer, Nilgiri Wood Pigeon and Ceylon Frogmouth.

Q91. Answer (b)

Explanation:

About Avalanche:-

- It is a mass of snow, rock, ice, soil, and other material sliding swiftly down a mountainside.
- Avalanches of rocks or soil are often called landslides.
- Snow slides are the most common kind of avalanche.
    - It can sweep downhill faster than the fastest skier.
- A snow avalanche begins when an unstable mass of snow breaks away from a slope.
- It occurs as layers in a snowpack slide off.
    - A snowpack is simply layers of snow that build up in an area, such as the side of a mountain.
- There are two main types of snow avalanches:
    - Sluff avalanches: occur when the weak layer of a snowpack is on top.
    - A sluff: is a small slide of dry, powdery snow that moves as a formless mass.
- Sluffs are much less dangerous than slab avalanches.
- A slab avalanche occurs when the weak layer lies lower down in a snowpack.

About important passes in Sikkim:-

Nathu La (Pass)-Nathu La

- It is a mountain pass in the Himalayas in the East Sikkim district.
- It connects the Indian state of Sikkim with China's Tibet Autonomous Region.
- Nathu means "listening ears" and La means "pass" in Tibetan.

Jalep La (Pass)-Jelep La or Jelep Pass

- It is at an elevation of 4,267 m or 13,999 ft.
- It is a high mountain passbetween East Sikkim District, Sikkim, India, and Tibet Autonomous Region, China.
- It is on a route that connects Lhasa to India.

Note:- Bomdi la and bum la passes are in Arunachal Pradesh.

Q92. Answer (b)

Explanation:

First-ever significant anti-spyware declaration:-
Aim: The declaration seeks to realize the importance of stringent domestic and international controls on the proliferation and use of this technology. Hence, **Statement 1 is correct.**

Need for this declaration: Threat posed by the misuse of commercial spyware e.g., Israeli software Pegasus, Hermit spyware

Countries involved: Australia, Canada, Costa Rica, Denmark, France, New Zealand, Norway, Sweden, Switzerland, the United Kingdom, and the United States

What is a Spyware?

Spyware is software with malicious behaviour that aims to gather information about a person or organization and send it to another entity in a way that harms the user—for example, by violating their privacy or endangering their device's security.

Q93. Answer (d)

Explanation:

What are the Major Highlights of the World Bank Report?

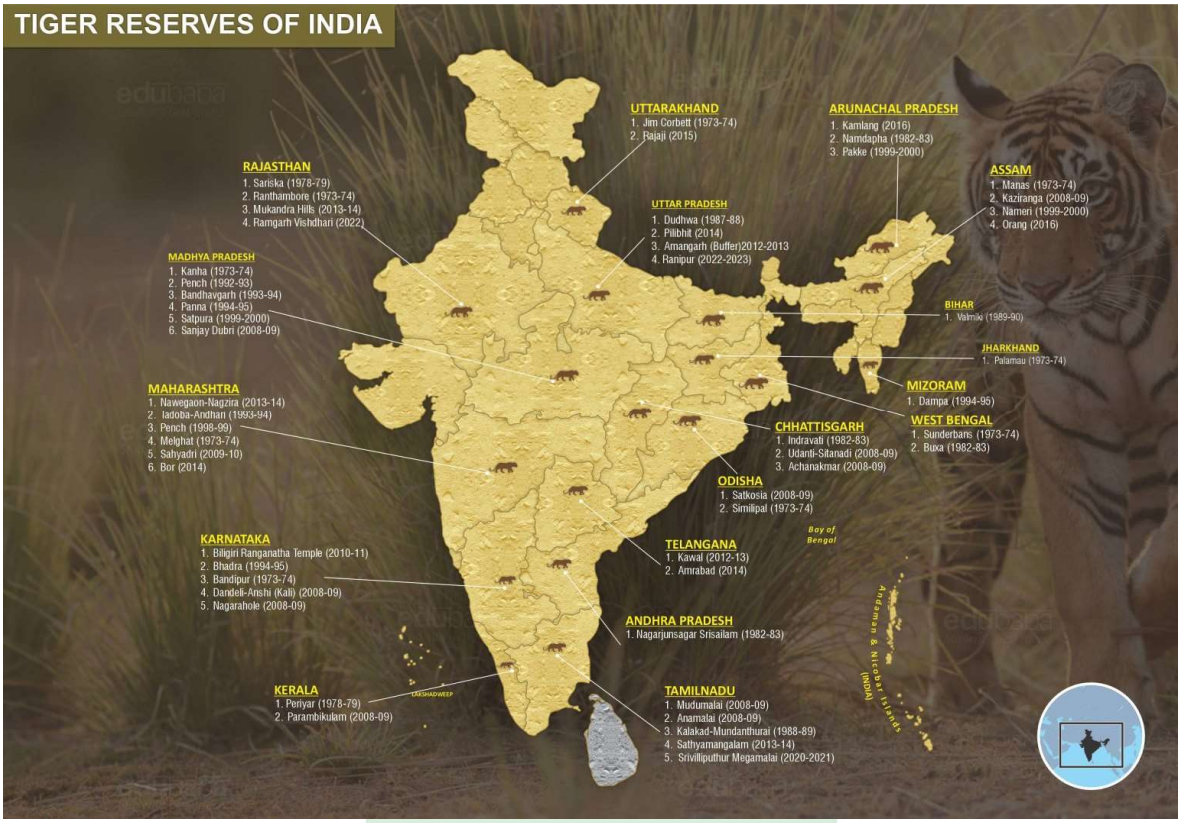
- India:
    - Growth Rate:
        - India's growth rate has been downgraded to 6.3% for FY 2023-24 ,and the report cites high borrowing costs and slower income growth as the primary reasons for this downgrade.
            - The female labour force participation rate and the size and productivity of the informal sector are also concerns in India.
        - However, the services sector and the construction sector are the fastest-growing industries in India, with strong investment growth and high business confidence.
        - India's growth rate is expected to grow at 6.4% in FY 2024-25, which is an upgrade of 0.3 % points from the previous forecast.

What is World Bank?

- About:
    - It was created in 1944, as the International Bank for Reconstruction and Development (IBRD) along with theIMF. The IBRD later became the World Bank.
    - The World Bank Group is a unique global partnership of five institutions working for sustainable solutions that reduce poverty and build shared prosperity in developing countries.
    - The World Bank is one of the United Nations specialized agencies.
- Members:
    - It has 189 member countries.
    - India is also a member country.
- Its Five Development Institutions:
    - International Bank for Reconstruction and Development (IBRD)
    - International Development Association (IDA)
    - International Finance Corporation (IFC).
    - Multilateral Guarantee Agency (MIGA)
    - International Centre for the Settlement of Investment Disputes (ICSID)
        - India is not a member of ICSID.

Q94. Answer (b)

Explanation:



About Parambikulam Tiger Reserve:-

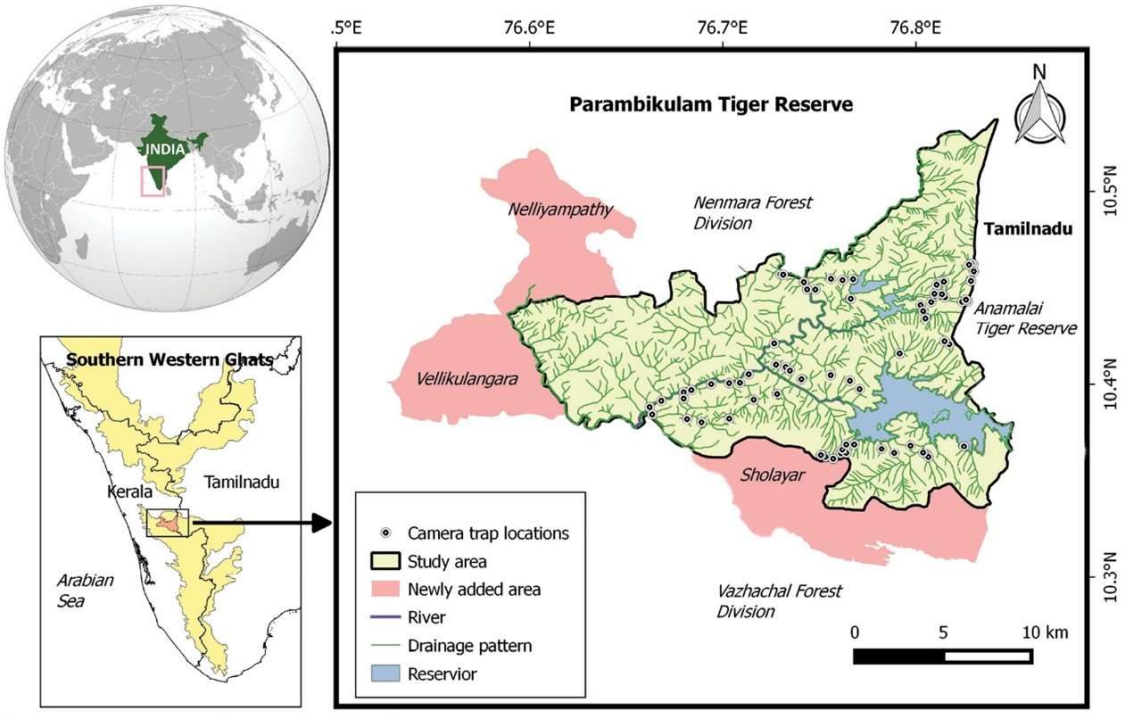


Figure 1. Location map of Parambikulam Tiger Reserve with Camera trap stations

- Parambikulam Tiger Reserve is located in the Palakkad and Thrissur districts of Kerala, South India.
- It includes the former Parambikulam Wildlife Sanctuary, which was established in part in 1973 and 1984.
- It stood 7th in the country in terms of Management Effectiveness in the 2018 Assessment (among 50 Tiger Reserves in the country).
- The area was declared a Tiger Reserve in 2010.
- A total extent of 643.66 sq km, out of which an extent of 390.89 km2 has been declared as the core or critical tiger habitat and 252.77 km2 as the buffer zone of the Tiger Reserve.
- Parambikulam is a well-protected part of the Nelliampathy – Anamalai sub-unit of the Western Ghat.
    - Nelliampathy: Anamalai sub-unit of the Western Ghats.
- Habitat: evergreen forests, moist and dry deciduous forests and grasslands.
    - Other unique habitats like montane grasslands and marshy grasslands (locally known as 'vayals') are extensively found.
- Parambikulam has one of the highest densities of the Gaur population in Southern India.
- It is also home to four different tribes of indigenous peoples, including the Kadar, Malasar, Muduvar, and Mala Malasar,settled in six colonies.
- The only South Indian wild goat, the nilgiri tahr is also found

Q95. Answer (b)

Explanation:

What is the Senkaku Island Dispute?

- About:
  - The Senkaku Island dispute concerns a territorial dispute over a group of uninhabited islands known as:
    - Senkaku Islands in Japan,
    - Diaoyu Islands in China, and
    - Tiaoyutai Islands in Taiwan.
  - Both Japan and China claim ownership of these islands.
- Location:
  - Eight uninhabited islands lie in the East China Sea. They have a total area of about 7 sq kmand lie northeast of Taiwan.

- Strategic Importance:
  - Islands are close to strategically important shipping lanes, offer rich fishing grounds and are thought to contain oil deposits.
- Japan's Claim:
  - After World War II, Japan renounced claims to a number of territories and islands including Taiwan in the 1951 treaty of San Francisco.
  - But under the treaty, the Nansei Shoto islands came under USA trusteeship and were then returned to Japan in 1971.
  - Japan says that Senkaku islands are part of the Nansei Shoto islands and hence they also belong to Japan.
  - Besides, China raised no objections to the San Francisco deal.
  - Only since 1970s, when the issue of oil resources in the area emerged, Chinese and Taiwanese authorities began pressing their claims.
- China's Claim:
  - These Islands have been part of its territory since ancient times, serving as important fishing grounds administered by the province of Taiwan.
  - When Taiwan was returned in the Treaty of San Francisco, China said the islands as part of it – should also have been returned.

- Taiwan Claims:
    - Taiwan claims the islands but has forged agreements with Japan to avoid any conflict as Japan maintains close defence ties with Taipei.
    - Despite the ongoing dispute, Japan maintains close defence ties with Taiwan.

Q96. Answer (d)

Explanation:

LIGO-India will be built by the Department of Atomic Energy and the Department of Science and Technology with an MoU with the U.S. National Science Foundation.

The observatory will be the third of its kind. It is made to the exact specifications of the twin LIGO, in Louisiana and Washington in the U.S.

A fourth detector in Kagra, Japan, is in the pipeline.

Four comparable detectors need to be operating simultaneously around the globe to localise a source of gravitational waves anywhere in the sky.

- About LIGO:

LIGO currently consists of two interferometers, each with two km long arms arranged in the shape of an L. These instruments act as antennae to detect gravitational waves.

It comprises stable high-power lasers, precisely figured mirrors, etc.

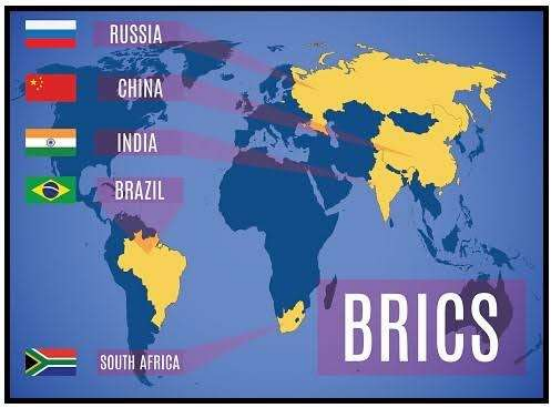
- About Gravitational Waves GW:

When two massive objects collide, they create a ripple in space and time in such a way that waves sciof undulating space-time would propagate in all directions away from the source. Hence, **Statement 1 is correct.**

Predicted in Einsteins General Theory of Relativity They travel at the speed of light, carrying with them information about their origins. Hence, **Statement 2 is correct.**

Q97. Answer (c)

Explanation:



What is BRICS?

- BRICS is an acronym for the grouping of the world's leading emerging economies, namely Brazil, Russia, India, China, and South Africa.
- In 2001, the British Economist Jim O'Neill coined the term BRIC to describe the four emerging economies of Brazil, Russia, India, and China.
- The grouping was formalized during the first meeting of BRIC Foreign Ministers in 2006.
- South Africa was invited to join BRIC in December 2010, after which the group adopted the acronym BRICS.
    - The Johannesburg declaration,2023 issued after the summit, said Argentina, Egypt, Ethiopia, Iran, Saudi Arabia and the United Arab Emirates (UAE) had been invited to become full members from January 1, 2024.
- The BRICS (prior to expansion) represented 41% of the global population, 24% of the global GDP, and 16 % of the global trade.
- Since 2009, its summits are held annually.

Q98. Answer (d)

Explanation:

About Extended Range Anti Submarine Rocket:-

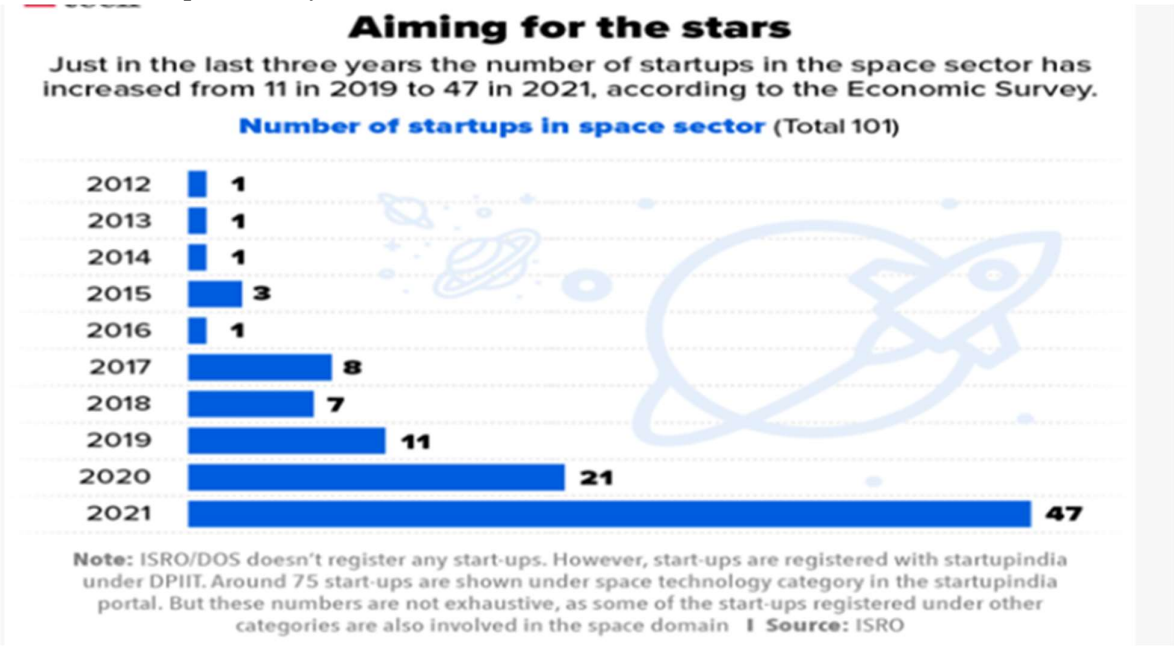
- The ER-ASR was designed by the Pune-based Armament Research and Development Establishment (ARDE) and the High Energy Materials Research Laboratory (HEMRL) of the DRDO. Hence**, Statement 1 is correct**.
- It is designed to intercept submarines at specific depths. Hence, **Statement 2 is correct.**
- Its rocket system will be deployed in anti-submarine operations.
    - It will be fired from an indigenised rocket launcher mounted onboard various Indian naval ships.

- ER-ASR can be fired in single or in salvo mode depending on the tactical mission requirements. Hence, **Statement 3 is correct**.
- The maiden successful test from the ship is a step towards enhancing the capability of the Indian Navy in anti-submarine warfare and towards achieving 'Atma Nirbharta' in defence.
- ER-ASR has been designed to replace the existing Russian-origin Rocket Guided Bombs (RGBs) which are already fitted in ships.
    - While the RGB has a range of five kilometres, the ER-ASR can achieve a range of over eight kilometres.

Q99. Answer (a)

Explanation:

About Indian Space Policy 2023:



- It seeks to institutionalise the private sector participation in the space sector, with ISRO focusing on research and development of advanced space technologies.
    - The policy will allow the private sector to take part in end-to-end space activities that include building satellites, rockets and launch vehicles, data collection and dissemination.
- The Indian Space Policy-2023, also delineated the roles and responsibilities of ISRO, space sector PSU NewSpace India Limited (NSIL) and Indian National Space Promotion and Authorization Centre (IN-SPACe).
    - Strategic activities related to the space sector will be carried out by NSIL, a public sector undertaking under the Department of Space, which will work in a demand-driven mode.
- The INSPACe, created recently, will be the interface between Indian Space Research Organisation and non-governmental entities.

- The policy also spells out the framework for the private sector to use ISRO facilities for a small charge and encourages them to invest in creating new infrastructure for the sector.
    - ISRO will not do any operational and production work for the space sector and focus its energies on developing new technologies, new systems and research and development.
- The operational part of ISRO's missions will be moved to the NewSpace India Limited, a public sector undertaking under the Department of Space.

Q100. Answer (c)
Explanation:

About India-Bhutan Bilateral Relations:

Strategic Importance of Bhutan

- Bhutan is important to India as a buffer state as it acts as a defence against China by protecting the chicken neck corridor.
- The Siliguri Corridor, or Chicken's Neck, is a narrow stretch of land of about 22 kilometres.
- It is located in the Indian state of West Bengal, which connects India's north-eastern states to the rest of India, with the countries of Nepal and Bangladesh lying on either side of the corridor.
- The Doklam stand-off re-established the strategic significance of Bhutan for India.

Trade and Economic Ties:

- India is Bhutan's largest trading partner.
- In 2020, bilateral trade accounted for 6% of Bhutan's total trade.
- Imports from India accounting for more than 77.1% of Bhutan's total imports.
- Bhutan's exports to India constituted 90.2 % of its total exports.
- The revised Bilateral Agreement on Trade, Commerce and Transit between India and Bhutan came into effect in 2017, and would be valid for ten years.
- In line with our 'Neighbourhood First Policy', new market access has been opened for five Agri-commodities from Bhutan to India (Areca nut, Mandarin, Apple, Potato, and Ginger), and three commodities from India to Bhutan (Tomato, Onion, and Okra).

- India allows 16 entry and exit points for Bhutanese trade with other countries (the only exception being China) and has agreed to develop and import a minimum of 10,000 megawatts of electricity from Bhutan by 2021.

Hydel Power Cooperation:

- Government of India has constructed three Hydroelectric Projects (HEPs) in Bhutan totalling 1416 MW, which are operational and exporting surplus power to India.
    - Hydropower exports provide more than 40% of Bhutan's domestic revenues and constitute 25% of its GDP.
- The ongoing cooperation between India and Bhutan in the Hydropower sector is covered under the 2006 Agreement on Cooperation in Hydropower and the Protocol to the 2006 agreement signed in March, 2009.
    - Under this Protocol, Government of India has agreed to assist Royal Government of Bhutan in developing a minimum of 10,000 MW of hydropower and import the surplus electricity from this to India by the year 2020.
- In April 2014, an Inter-Governmental Agreement was signed between India and Bhutan for development of four more HEP's of capacity 2120 MW.
- India has constructed three Hydroelectric Projects (HEPs) in Bhutan:
    - Chukha HEP,
    - Kurichhu HEP
    - Tala HEP which is operational and exporting surplus power to India.
- Recently, India completed a 720 MW Mangdechhu Hydroelectric Power Project and both sides are in process of expediting the completion of other ongoing projects including the 1200MW Punatsangchhu-1 & 1020MW Punatsangchhu-2.

Multilateral Partnership and Defence:

- Both India and Bhutan are founding members of SAARC that deals with economic, social and cultural development of South Asian Region.
- Both of them also share other multilateral forums such as BBIN(Bangladesh, Bhutan, India, and Nepal), BIMSTEC (Bay of Bengal Initiative for Multi Sectoral Technical and Economic Cooperation)
- Apart from defence ties governed through Friendship Treaty, the Eastern Army Command and the Eastern Air Command both have integrated protection of Bhutan into their role.
- The Indian Military Training Team (IMTRAT), headed by a Major General, plays a critical role in training Bhutanese security personnel.

Q101. Answer (c)

Explanation:

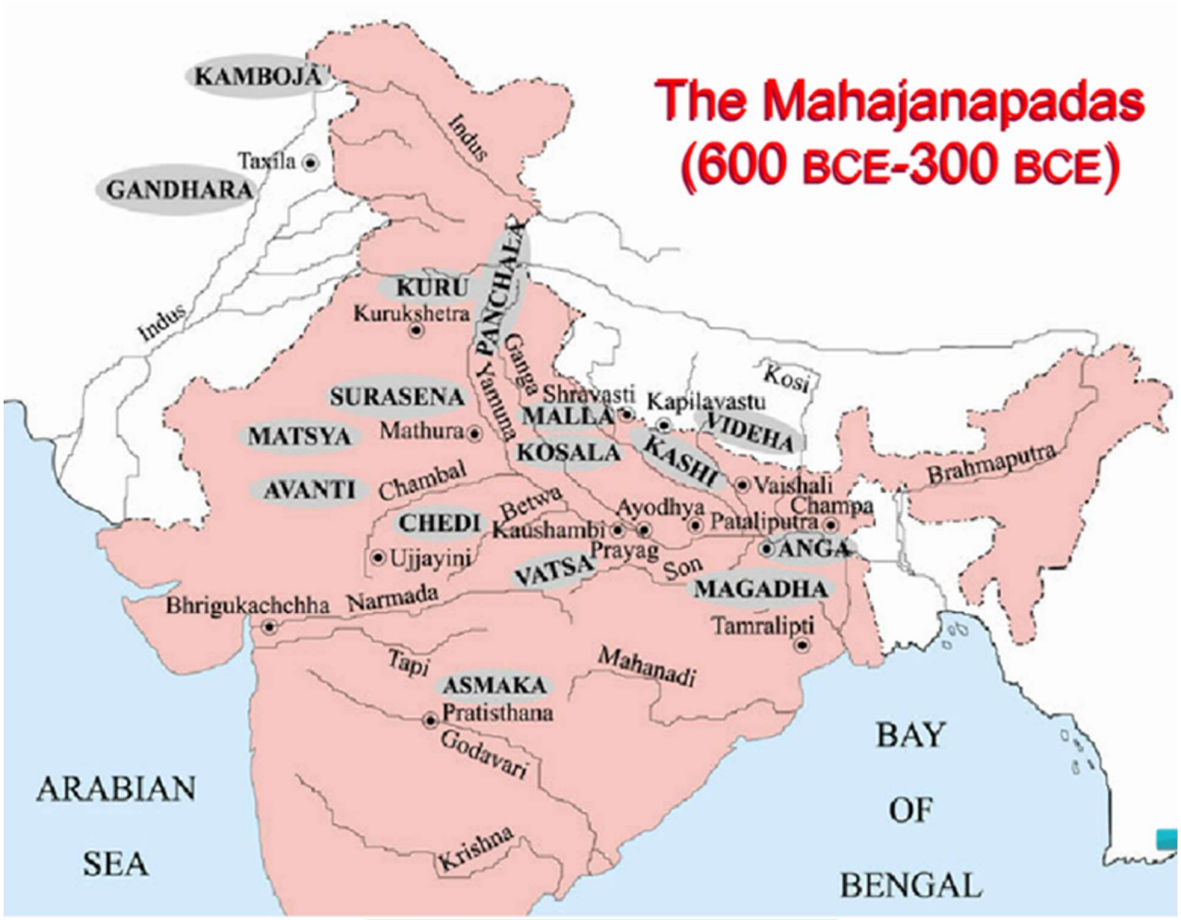
About Kaushambi Mahotsav-2023:-

- Kaushambi Mahotsav-2023 is asports festival.
- It is organized by the Member of Parliament.
- These Khel Mahotsavs give platforms to young players to showcase their talent
- About 16000 youths online applied to participate in the 'Sansad Khelkood Spardha'
    - Sansad Khelkood Spardha: started by the Members of Parliament.

About Durga Bhabhi:-

- Durga Devi was a freedom fighter from Kaushambi.
- She was fondly called 'Durga Bhabhi'.
- She was married to Bhagwati Charan Vohra.
- She had spent her savings ₹5,000 given by her husband on revolutionary works and in support of Indian revolutionaries fighting against British imperialism.
- She was a woman revolutionary and spy.
- She gave shelter to Bhagat Singh, Sukhdev and Rajguru after the assassination of Assistant Superintendent of Police John Saunders and later rescued them out of Lahore by agreeing to introduce herself as Bhagat Singh's wife to save him from the British police.
- She met several Bengali revolutionaries and even learned bomb-making.
- She was an active member of the Naujawan Bharat Sabha.
- On 8 October 1930, she fired on a British sergeant and his wife near the police station in South Bombay's Lamington Road, before escaping.
    - The shooting was to avenge the death sentence awarded to Bhagat Singh, Sukhdev and Rajguru.
- She was finally arrested in September 1932.
- In 1935, she moved to Ghaziabad and started teaching in a school.
- Later, she opened a school in Lucknow for poor children.
    - Pandit Jawaharlal Nehru even visited the school once,

About Mahajanpadas:-



- The Mahjanapadas were sixteen oligarchic republics or kingdomsthat existed in ancient India.
- It existed from the sixth to the fourth century BCE.
- There were sixteen of such Mahajanapadas: Kasi, Kosala, Anga, Magadha, Vajji, Malla, Chedi, Vatsa, Kuru, Panchala, Machcha, Surasena, Assaka, Avanti, Gandhara and Kamboja.
- The strongest and most influential Mahajanapada was Magadha.
- When the tribes (Janas) of the late Vedic period made the decision to establish their own territorial communities.
- It resulted, in new and long-lasting regions of settlement known as “states” or “janapadas”
    - Janapadas: small kingdoms known that eventually gave rise to Mahajanapadas.

The 16 Mahajanapadas were:-

Mahajanpadas	Capital
Anga	Champa
Magadha	Rajagriha
Kasi	Kasi
Vatsa	Kaushambi
Kosala	Shravasti (northern), Kushavati (southern)
Shurasena	Mathura

Panchala	Ahichchhatra and Kampilya
Kuru	Indraprastha
Matsya	Viratanagara
Chedi	Sothivathi
Avanti	Ujjaini or Mahishmati
Gandhara	Taxila
Kamboja	Poonch
Asmaka	Potali/Podana
Vajji	Vaishali
Malla	Kusinara

Q102. Answer (b)
Explanation: