

1. Answer: a

Explanation:

Statement 1 is incorrect:

According to a later tradition, the spread of Jainism in Karnataka is attributed to **Chandragupta Maurya (322-298 B.C.)**. The emperor became a Jaina, gave up his throne and spent the last years of his life in Karnataka as a Jaina ascetic.

Statement 2 is incorrect:

With its emphasis on non-violence and the sanctity of animal Life, Buddhism boosted the cattle wealth of the country. The **earliest Buddhist text Suttanipata** declares the cattle to be givers of food, beauty and happiness (annadavannadasukhada), and thus pleads for their protection.

Statement 3 is correct:

This teaching of Buddhism came significantly at a time when the non-Aryans slaughtered animals for food, and the Aryans in the name of religion. The brahmanical insistence on the **sacredness of the cow and non-violence was apparently derived from Buddhist teachings.**

2. Answer: D

Explanation:

- 1st statement is correct. Kalyana Mandapa is an open pavilion meant for ceremonies involving the symbolic marriage of the temple's divinity to his consort. Its interior, surrounded by impressive columns containing a platform in the centre for the performance of sacred dances, was a unique sculptural feature of King Krishnadevaraya.
- 2nd statement is correct. Vijayanagara rulers were known for incorporating royal portraits and sculptures in their architectural designs, showcasing the association between the royalty and the divine. This was a notable feature in Vijayanagara art and architecture.
- 3rd statement is correct. Hazara Rama Temple at Hampi was indeed a private temple used by the Vijayanagara kings for their exclusive worship. The temple is known for its exquisite bas-reliefs depicting scenes from the Ramayana.

3. Answer: c

Explanation:

Rock Shelters of Bhimbetka: Located in Madhya Pradesh, India, Bhimbetka is known for its prehistoric rock shelters and caves with paintings dating back to the Paleolithic and Mesolithic periods.

Caves of Aggtelek Karst and Slovak Karst: These caves, located on the border of Hungary and Slovakia, are known for their impressive stalactite and stalagmite formations. While not specifically known for prehistoric rock art, this option is incorrect.

Tsodilo Hills: Tsodilo Hills in Botswana is known for its rock art and is often referred to as the "Louvre of the Desert." The area contains thousands of rock paintings dating back thousands of years.

Serra da Capivara: Located in Brazil, Serra da Capivara is known for its extensive collection of prehistoric rock art, including paintings and engravings depicting scenes from ancient life.

4. Answer: b

Explanation:

Bandhani is a traditional tie-dye method practiced in the state of Gujarat. It involves tying the fabric tightly at different points and then dyeing it, creating various patterns.

Shibori is a tie-dye technique that originated in Japan. It involves various methods of binding, folding, and compressing fabric before dyeing to create unique patterns.

Leheriya is a traditional tie-dye art form originating from Rajasthan. It involves the use of diagonal stripes on the fabric, creating a distinctive wave-like pattern.

Batik from Indonesia is a method of dyeing where wax is applied to parts of the fabric to resist dye before the entire fabric is dyed.

5. Answer: D

Explanation:

Statement 1 is Correct: Mehrgarh is located near the Bolan Pass, a strategic route that facilitated trade and cultural exchange between the Indus Valley and the Iranian Plateau from ancient times. This geographical location played a crucial role in shaping Mehrgarh's development, potentially allowing access to new technologies, crops, and ideas.

Statement 2 is Correct: Mehrgarh holds significant evidence for the early domestication of wheat, barley, and cotton in South Asia. Excavations have unearthed remains of domesticated wheat and barley dating back to 7000 BCE, alongside tools used for their cultivation and processing. This makes Mehrgarh a vital site for understanding the transition from

hunter-gatherer societies to settled agricultural communities in the region. While cotton domestication might have occurred later, around 3500 BCE, Mehrgarh still provides early evidence of its cultivation.

Statement 3 is Correct: Mehrgarh is considered a crucial precursor to the IVC, showcasing the early stages of urban development in the region. The site reveals evidence of permanent settlements, mud-brick structures, granaries, and specialized craft production, all of which foreshadowed the sophisticated urbanism of the later IVC.

Statement 4 is Correct: While the extent and nature of social stratification at Mehrgarh are debated, evidence suggests some differences in status existed. This is seen in the varying sizes and complexity of houses, the presence of elaborate grave goods associated with some burials, and the use of specific materials and ornamentation by certain individuals. These findings hint at emerging social hierarchies, though further research is needed to fully understand their nature.

Statement 5 is Correct: Burials at Mehrgarh offer valuable insights into the belief systems and social practices of its inhabitants. Associated grave goods like pottery, beads, bangles, and even animal figurines suggest beliefs about the afterlife and potential differences in status during life. Analyzing these materials helps reconstruct the social and spiritual world of the early inhabitants.

Mehrgarh

Mehrgarh, nestled in the Kacchi Plain of Balochistan, Pakistan, stands as a testament to the earliest human settlements in South Asia. Dating back to around 7000 BCE, this Neolithic site offers archaeologists a glimpse into a dynamic past, where communities transitioned from hunter-gatherers to farmers, herders, and craftspeople. Let's delve into the depths of Mehrgarh, exploring its history, discoveries, and significance:

History and Excavations

Discovery (1974): French archaeologists Jean-François and Catherine Jarrige stumbled upon Mehrgarh, initially believing it to be a Bronze Age site. Extensive excavations between 1974-1986 and 1997-2000 revealed its much older Neolithic roots.

Key Discoveries

- **Agriculture and Herding:** Mehrgarh holds the title of the earliest known agricultural settlement in South Asia. Archaeologists have unearthed remains of domesticated wheat, barley, and fruits alongside bones of cattle, sheep, and goats, signifying the transition from hunter-gathering to a settled way of life.
- **Pottery:** From unpainted ceramics in Period I to elaborately decorated wares in later periods, Mehrgarh showcases the evolution of pottery in the region. These artefacts shed light on daily life, trade networks, and even ritual practices.
- **Mud-Brick Architecture:** Period I saw the use of mud-brick houses, indicating permanent settlements and advancements in construction techniques. Later periods reveal complex structures, including granaries, workshops, and even a possible citadel.
- **Bead Making and Craftsmanship:** From beads and figurines to tools and weapons, Mehrgarh exhibits a rich array of crafts. Materials like turquoise, lapis lazuli, and shell indicate trade with distant regions.
- **Early Metallurgy:** The discovery of copper and faience beads suggests the beginnings of metalworking in Period IV, a significant step towards technological advancements.
- **Burials and Rituals:** Elaborate burials from Period VII, including grave goods and decorated pottery, offer insights into the community's beliefs and social hierarchy.



Significance of Mehrgarh:

- **Understanding South Asian Prehistory:** Mehrgarh provides a crucial link between the hunter-gatherer societies of the Paleolithic and the later Indus Valley Civilization. It helps reconstruct the timeline and process of agricultural and social development in the region.
- **Global Connections:** The site's evidence of trade networks, materials like lapis lazuli, and similarities with Near Eastern Neolithic cultures suggest connections beyond South Asia, highlighting early interaction and cultural exchange.
- **Continuing Research:** Ongoing excavations continue to unveil new secrets about Mehrgarh, offering valuable insights into the lives of its inhabitants and their contributions to the development of South Asian civilization.

6. Answer: C

Explanation:

Pair 1 is Incorrect: While the Mauryan Empire did create impressive rock-cut sculptures (the Barabar Caves), their signature artistic contribution is typically considered to be their polished pillars with animal motifs, not necessarily featuring Hellenistic influences. The Hellenistic influence was more prominent in the art of later empires like the Gandhara school.

Pair 2 is correct: This is a well-known association. The Ajanta Caves, a UNESCO World Heritage Site, house some of the finest examples of ancient Indian art, with many paintings depicting stories from the Jatakas, and tales about the Buddha's previous lives.

Pair 3 is correct: The Badami cave temples, also known as the Pattadakal caves, are renowned for their exquisite sculptures and carvings showcasing Hindu and Jain themes. These caves stand as a testament to the artistic prowess of the Chalukya Empire.

Pair 4 is correct: The Shore Temple, a magnificent group of three temples carved from single granite outcrops, is a prominent example of Pallava-era monolithic architecture. It showcases their mastery in sculpting and stonework.

7. Answer: C

Explanation:

Chandragupta II was succeeded by his second son Kumaragupta I, born of Mahadevi Dhruvasvamini. Kumaragupta I assumed the title, Mahendraditya. He ruled until 455. Towards the end of his reign a tribe in the Narmada valley, the Pushyamitras, rose in power to threaten the empire. The Kidarites as well probably confronted the Gupta Empire towards the end of the rule of Kumaragupta I, as his son Skandagupta mentions in the Bhitari pillar inscription his efforts at reshaping a country in disarray, through reorganisation and military victories over the Pushyamitras and the Hunas.

He was the founder of Nalanda University which on 15 July 2016 was declared as a UNESCO world heritage site. Kumaragupta I was also a worshipper of Kartikeya.

8. Answer: A

Explanation:

Only the first pair is correctly matched.

Guhilas of Mewar were a Rajput dynasty that ruled the Kingdom of Mewar (Medapata, modern Mewar) region in present-day Rajasthan. Post-13th-century records name the dynasty's founder as Bappa Rawal. Hence, Option A) is correct.

The Guhila kings initially ruled as Gurjara-Pratihara feudatories between the end of 8th and 9th centuries and later were independent in period of the early 10th century and allied themselves with the Rashtrakutas. Their capitals included Nagahrada (Nagda) and Aghata (Ahar). The Guhilas assumed sovereignty after the decline of the Pratiharas in the 10th century under Rawal Bharttripatta II and Rawal Allata. During the 10th-13th centuries, they were involved in military conflicts with several of their neighbours, including the Paramaras, the Chahamanas, the Delhi Sultanate, the Chaulukyas, and the Vaghelas. In the late 11th century, the Paramara king Bhoja interfered in the Guhila throne possibly deposing a ruler and placing some other ruler of the branch. In the mid-12th century, the dynasty divided into two branches. The senior branch (whose rulers are called Rawal in the later medieval literature) ruled from Chitrakuta (modern Chittorgarh), and ended with Ratnasimha's defeat against the Delhi Sultanate at the 1303 Siege of Chittorgarh. The junior branch rose from the village of Sisoda with the title Rana and established the Sisodia Rajput dynasty.

Jayashakti was a 9th-century ruler from the Chandela dynasty of Central India. In the Chandela records, he is generally mentioned with his younger brother and successor, Vijayashakti. The two are believed to have ruled the Chandela kingdom between c. 865 and 885 CE. They consolidated the Chandela power.

Jayashakti succeeded his father Vakpati. He is also known as Jeja or Jejjaka. An inscription found at Mahoba states that the Chandela territory (later called Bundelkhand) was named "Jejakabhukti" after him.

Hence, Option B) is incorrect.

Rama Kulasekhara was the last ruler of the Chera Perumal dynasty of medieval Kerala. He was a contemporary of Chola kings Kulottunga I (1070–1120) and Vikrama Chola (1118–35 AD). Rama Kulashekara is best known for briefly recovering the Kollam-Trivandrum-Nagercoil region from the powerful Chola empire around 1100/02 AD. Hence, Option C) is incorrect.

Shashanka was the first independent king of a unified polity in the Bengal region, called the Gauda Kingdom and is a major figure in Bengali history. Shashanka, is credited with creating the Bengali calendar. He is the contemporary of

Harsha and of Bhaskaravarman of Kamarupa. His capital was at Karnasubarna, in present-day Murshidabad in West Bengal. Hence, Option D is incorrect.

9. Answer: B

Explanation:

Statement 1 is Correct: The Act explicitly divided British India into two dominion states: India and Pakistan. This partition, based on religious majority areas, was intended to address concerns of the Muslim League but ultimately led to widespread displacement and violence.

Statement 2 is Correct: The partition triggered unprecedented mass migration across newly drawn borders. Millions of Hindus, Muslims, and Sikhs crossed borders facing immense hardships and violence. This mass displacement left deep scars on both nations.

Statement 3 is Correct: The partition, unfortunately, coincided with religious tensions and anxieties. Widespread communal violence erupted in both countries, resulting in tragic loss of life and property.

Statement 4 is Incorrect: While both India and Pakistan eventually adopted democratic constitutions, it wasn't a direct consequence of the Independence Act. Both nations independently undertook the process of drafting their constitutions in later years.

Statement 5 is Incorrect: India's rise as a major player on the world stage is a complex process with multiple contributing factors. The Independence Act marked a crucial step towards self-determination, but India's rise took time and involved various political, economic, and social developments beyond the immediate aftermath of independence.

10. Answer: A

Explanation:

Statement 1 is correct: The Champaran Inquiry Commission, formed in 1917, investigated the exploitative practices faced by farmers under the tinkathia system of indigo cultivation. In its report submitted in October 1917, the Commission recommended the complete abolition of this system. This recommendation was accepted by the Bihar and Orissa governments, leading to the Champaran Agrarian Act of 1918, which officially outlawed the tinkathia system.

Statement 2 is incorrect: While the Commission did not directly mandate a specific price, it aimed to create a fairer system for indigo cultivation. Their recommendations included:

- **Voluntary agreements:** Farmers could now choose whether to cultivate indigo and negotiate terms freely with planters.
- **Limited cultivation area:** The area dedicated to indigo could not exceed 3/20th of a farmer's land.
- **Compensation:** Farmers were due compensation for past forced cultivation and unfair exactions by planters.
- These measures, combined with the abolition of the mandatory Tinkathia system, undoubtedly improved the overall conditions for farmers involved in indigo cultivation. However, setting a fixed "fair price" wasn't explicitly part of the Commission's recommendations.

Statement 3 is incorrect: The Champaran Inquiry Commission's focus was primarily on addressing the exploitative practices specific to indigo cultivation. While the plight of farmers under the British Raj was a broader issue, land reforms encompassing broader aspects of land ownership and tenancy were not directly addressed by this Commission.

Statement 4 is incorrect: The Commission didn't directly propose "stricter regulations" in the sense of increased government oversight. However, their recommendations did indirectly limit and constrain the planters' power over farmers. By abolishing the Tinkathia system, establishing voluntary agreements, and providing compensation, the Commission significantly reduced the potential for exploitation and coercion used by planters.

11. Answer: D

Explanation:

Kalinjar Fort built by the Chandelas is an example of the grand architecture of the reign of the Chandela dynasty. It is strategically located on an isolated rocky hill at the end of the Vindhya Range, overlooking the plains of Bundelkhand. The major attraction in the fort is the Neelkanth temple which was built by Chandella ruler Parmardi Dev (1165 - 1203 CE). The temple is built in a cave with two dark lingas inside - one each to indicate Shiva and his consort Parvati. The mandap in front of the temple is exquisitely carved. Equally interesting is a 24-foot-high statue of KalBhairava, with 18 hands which even found a mention in Abul Fazl's Ain-i-Akbari.

Kalinjar Fort was ruled by several dynasties including **the Guptas, the Vardhana Dynasty, the Chandelas, (Solankis) of Rewa, Mughal and the Marathas.** Hence, all the options are correct and D) All - is the right answer.

Kalinjar came into prominence in 1019 CE, when Mahmud of Ghazni attacked the Chandella kingdom specifically Kalinjar during his tenth invasion of India. Alexander Cunningham reproduced an account of Ghazni's invasion of Kalinjar by Nizamuddin Ahmad (1551-1621 CE), a prominent historian in Akbar's court.

12. Answer: D

Explanation:

Dynasties that ruled over the Kashmir region during the medieval times:

- Karkota dynasty (625 - 855)
- Utpala dynasty (855 - 1012)
- Lohara dynasty (1003 - 1339)
- Shah Mir dynasty (1339 - 1561)
- Chak dynasty (1561 - 1579)
- Baihaqi dynasty
- Chak dynasty Restored (1579 - 1589)
- Mughal Empire (1586 - 1752)
- Durrani Empire (1752 - 1754)

13. Answer: C

Explanation:

Key Terms of Medieval India History

Term	Meaning
Diwan	A person who held the revenue department
Diwan-i-Insha	Ministry of Royal correspondence
Diwan-i-Kul	Wazir
Devdana	Land granted to temples
Faujdar	Administrative head of district
Ganj	Grain market
Ibadatkhana	House of worship
Hundis	Bill of exchange
Hun	Gold coin
Khutba	sermon made in Friday mosque
Brahmadeya	Revenue free land grants to Brahmins
Barids	Official in charge of intelligence and newsgathering
Ghatikas	Educational institutions in southern India
Araghatta	Persian wheel used in irrigation
Paracheri	Outer castes house
Ur	General assembly of the village
Mandalam	Province
Vellala	Agriculturists
Nadu	Districts
Sthalas	Sub-districts
Naik	Governor who administered each Province.
Wazir	Chief Minister; in charge of Revenue & Finances
Wakil-i-dar	Controller of Royal household
Amir-i-hazib	Officer in charge of the Royal court
Amir	Officer in charge of collecting revenue
Mukti/ Wali	Responsible for law & order and collection of taxes
Diwan-i-Arz	Department of Military

Diwan-i-Bandagan	Department of Slaves
Diwan-i-Mustakhranj	Department of Arrears
Diwan-i-Insha	Department of Correspondence
Diwan-i-Waziyat	Department of Finance. It was headed by Wazir
Iqtadar	Governor, a person in whose charge an Iqta has been placed.
Kotwal	Head of city administration.
Fawazil	Excess amount of surplus of revenue appropriated from Iqta after detraying salary (of the Iqta holder) and meeting expenditure of troops.
Khams	Booty captured in war.
Jizya	A tax levied on non-Muslims in their capacity as protected subjects.
Ghari	House tax
Masahat	Measurement of land
Biswa	A common measure of area in northern India, equivalent to 1/20 of a bigha
Qazi-ul-Quzat	Head of Judicial Department
Mir-i-arz	Officer in Charge of Petition
Muhtasib	Censor of Public Morals
Waqia Navis	News Reporters
Amal/ Amalguzar	Revenue Collection
Muqaddam	Headman
Patwari	Accountant
Chauth	It was a tax levied on the regions that were outside the control of Marathas. It was one-fourth of tax given by the people to the Mughal empire.
Sardeshmukhi	Sardeshmukhi was a claim to one-tenth of standard land revenue. It was imposed on the entire population of the villages or town as a mark of their recognition of the Maratha king as their Sardeshmukh (Chief Headman).
Nyayadhish	Judiciary
Amatya or Mazumdar	Finance Minister
Sachiv	Official Correspondence
Taniyurs	Village under the Cholas
Ghatikas	Institutions of learning attached to temples
Eripatti	Land donated by the individuals. Revenue from it was used for maintenance of village tanks.
Panchayatan	Style of temple construction

14. Answer: C

Explanation:

Similarities:

- **Military and Political Strategies:** Both Robert Clive and Warren Hastings used a combination of military campaigns and political manoeuvring to expand British influence in India. They understood the limitations of pure military conquest and recognized the importance of forming alliances and manipulating local political rivalries to their advantage.
- **Landmarks of Expansion:** Clive's victory at the Battle of Plassey (1757) against Siraj-ud-daulah, Nawab of Bengal, marked a pivotal moment in establishing British dominance in eastern India. Hastings, after the British victory at the Battle of Buxar (1764), focused on consolidating and expanding that power across the subcontinent.
- **Accusations of Corruption:** Both faced accusations of corruption and questionable methods in their dealings with local rulers. Clive accepted gifts and negotiated treaties on terms beneficial to the East India Company, raising concerns about ethical conduct. Hastings implemented controversial policies like the Dual System of administration, which critics viewed as exploitative.

Differences:

- **Focus and Strategies:** While Clive primarily focused on securing military victories and establishing initial footholds, Hastings spent more time on administrative reforms and consolidating political control. He implemented measures like the Permanent Settlement (1793), which aimed to regulate land revenue collection but had long-lasting economic and social impacts.
- **Personalities and Approaches:** Clive's style was bold and decisive, often favouring direct military action. Hastings, in contrast, was known for his more cautious and diplomatic approach, relying on negotiation and manipulation to achieve his goals.
- **Historical Legacies:** Although both played crucial roles in establishing British power, their long-term impacts differed. Clive's victories laid the foundation for British expansion, but his methods generated criticism and fueled anti-colonial sentiment. Hastings' administrative reforms had far-reaching consequences, shaping the economic and social landscape of India under British rule.

15. Answer: C

Explanation:

Statement 1 is correct: Tipu Sultan, also known as the Tiger of Mysore, played a pivotal role in the Battle of Seringapatam in 1799. He was the ruler of the Kingdom of Mysore and led his forces against the British East India Company. His resistance against British expansion in South India marked a significant chapter in Indian history, particularly in the context of the Anglo-Mysore Wars.

Statement 2 is correct: Major General Baird, a British military officer, indeed played a crucial role in the Battle of Seringapatam. He commanded the British East India Company troops during the siege of the fort. The capture of Seringapatam in 1799 resulted in the death of Tipu Sultan and marked the end of the Fourth Anglo-Mysore War.

Statement 3 is incorrect: The Maratha Empire, under the leadership of the Peshwas, had entered into alliances with the British East India Company during this period. Therefore, the Marathas were not supporting Tipu Sultan in the Battle of Seringapatam. Instead, they were allied with the British against common adversaries.

Statement 4 is correct: The Nizam of Hyderabad, another significant princely state, was allied with the British during the Battle of Seringapatam. The collaboration of regional powers with the British was a strategic aspect of British military and political endeavours in India during the late 18th century.

16. Answer: B

Explanation:

- Many NPUs support low-precision arithmetic operations (e.g., 8-bit or even lower) to reduce computational complexity and energy consumption.
- While CPUs mainly use sequential computing, NPUs and GPUs leverage parallel computing for faster and more efficient processing, with NPUs being specifically optimized for AI tasks.
- Initially developed for rendering graphics in video games and multimedia applications, GPUs are highly efficient at parallel processing but are not specifically designed for AI workloads.

17. Answer: D

Explanation:

Non-market economies, as classified by the US, are determined based on specific criteria, including the **convertibility of currency, wage determination through free bargaining, allowance of joint ventures and foreign investment, ownership of means of production by the state, state control over resource allocation, pricing, and output decisions, and consideration of factors like human rights. This classification holds significant implications, particularly concerning trade relations.** Non-market economy status grants the US the authority to levy "anti-dumping" duties on imports from designated countries. Dumping, characterized by export prices set below domestic prices, poses potential harm to importing country industries. Anti-dumping duties serve to mitigate this disparity by compensating for the difference between exported goods' prices and their normal value. The methodology for determining these duties involves reliance on a third-country benchmark, often a market economy such as Bangladesh, to evaluate the value of products imported from non-market economies. However, this approach overlooks company-specific data from non-market economies like Vietnam, potentially leading to discrepancies in duty calculations.

18. Answer: B

Explanation:

The 10 Biggest Telescopes on Earth

- **500-meter Aperture Spherical Telescope (FAST)**
 - Location: Guizhou, China
 - Type: Radio
 - Diameter: 1,640 feet (500 meters)
 - Description: FAST, opened in 2020, is the world's largest single-dish ground telescope, contributing significantly to radio astronomy research.
- **Extremely Large Telescope (ELT)**
 - Location: Atacama desert, Chile
 - Type: Optical-infrared
 - Diameter: 128 feet (39.3 meters)
 - Description: Designed by the European Southern Observatory (ESO), ELT aims to discover Earth-like planets and search for extraterrestrial life.
- **Square Kilometre Array (SKA)**
 - Location: Australia and South Africa
 - Type: Phased array, radio
 - Diameter: 512 × 49.2 feet (512 × 15 meters)
 - Description: SKA, an international project, will feature telescope arrays 100 times more sensitive than current sites, revolutionizing radio astronomy.
- **Thirty Meter Telescope (TMT)**
 - Location: Mauna Kea, Hawaii
 - Type: Optical-infrared
 - Diameter: 98 feet (30 meters)
 - Description: Under construction, TMT will analyze black holes and galaxies with its large primary mirror consisting of 492 hexagonal panels.
- **Giant Magellan Telescope (GMT)**
 - Location: Atacama desert, Chile
 - Type: Optical
 - Diameter: 80 feet (24.5 meters)
 - Description: Scheduled for completion in 2029, GMT promises images ten times clearer than the Hubble Space Telescope.
- **Atacama Large Millimeter Array (ALMA)**
 - Location: Atacama desert, Chile
 - Type: Radio
 - Diameter: 39.4 feet (12 meters)
 - Description: ALMA consists of 66 radio telescopes and has made groundbreaking discoveries, including detecting the most distant oxygen in space.
- **South African Large Telescope (SALT)**
 - Location: Karoo, South Africa
 - Type: Optical
 - Diameter: 36 feet (11 meters)

- Description: Inspired by Hobby Eberly, SALT boasts improved field of view and sensitivity to short wavelengths, contributing to discoveries like the first white dwarf pulsar.
- **Gran Telescopio Canarias (GTC)**
 - Location: La Palma, Spain
 - Type: Optical-infrared
 - Diameter: 34.1 feet (10.4 meters)
 - Description: GTC discovered the most densely populated galaxy cluster, showcasing its capabilities in optical-infrared astronomy.
- **Keck Telescopes**
 - Location:Maunakea, Hawaii
 - Type: Optical and Infrared
 - Diameter: 32.8 feet (10 meters)
 - Description: The twin telescopes at Keck Observatory surpass the Hubble Telescope in observing capabilities, producing clear images in visible light and infrared.
- **Hobby Eberly**
 - Location: Texas, United States
 - Type: Optical
 - Diameter: 32 feet (10 meters)
- Description: Known for its unique design, Hobby Eberly's rotating mechanism allows it to observe 70 percent of the visible sky, contributing to significant discoveries like distant quasars.

19. Answer: B

Explanation:

Statement 1 is incorrect:

- The Pyrenees mountain range serves as a natural border between Spain and France, not Italy. The range runs approximately 430 kilometres from the Bay of Biscay in the Atlantic Ocean to the Mediterranean Sea. It forms a significant geographical and political boundary between these two countries, but Italy is not part of this border.

Statement 2 is correct:

- The Pyrenees effectively separate the Iberian Peninsula, where Spain and Portugal are located, from the rest of continental Europe. Geographically, this mountain range acts as a formidable barrier that impacts climate, flora, fauna, and human migration patterns in the region.

Statement 3 is correct:

- The Pyrenees stretch from the Bay of Biscay in the west, near the Atlantic Ocean, to the Mediterranean Sea in the east. This geographical positioning contributes to the Pyrenees' diverse ecosystems and climates, ranging from lush green valleys to high-altitude rocky peaks.

Statement 4 is incorrect:

- The Pyrenees are primarily composed of ancient crystalline rocks, including granite, gneiss, and schist, which are typical of non-volcanic mountain ranges formed through tectonic processes. Unlike volcanic mountain chains like the Andes or the Cascade Range, the Pyrenees' formation is predominantly due to tectonic collision and uplift rather than volcanic activity.

20. Answer: C

Explanation:

The Tirthahalli region in Karnataka has garnered recognition for producing the highest quality arecanut, notably through its superior varieties like Nuli, Hasa, Rashi, Bette, and Gorabalu. An analysis conducted by the Areca Research Centre at KeladiShivappa Nayaka University of Agricultural and Horticultural Sciences in Shivamogga confirmed the exceptional attributes of the Tirthahalli variety, surpassing counterparts from other regions. This superiority was attributed to traditional cultivation practices, particularly by small-scale growers with two to five acres of plantation. The grading process further underscored the premium value of Nuli and Hasa nuts, which command higher prices in the market compared to Rashi, Bette, and Gorabalu varieties. Market trends reflect this preference, with Hasa nuts fetching an average price of ₹69,600 per quintal and reaching a maximum of ₹80,800, highlighting the strong demand for top-quality arecanuts. Chemical analysis affirmed the consistent quality of Tirthahalli arecanuts, reinforcing their esteemed reputation among consumers, traders, and farmers.

21. Answer: C

Explanation:

- **Red Notice:** A Red Notice is issued to seek the location and arrest of individuals wanted by judicial authorities for prosecution or to serve a sentence based on an arrest warrant or court decision.
- **Yellow Notice:** A Yellow Notice is issued to help locate missing persons, often minors, or to help identify persons who are unable to identify themselves, such as individuals with amnesia or other cognitive disorders.
- **Blue Notice:** A Blue Notice is issued to collect additional information about a person's identity, location, or activities in relation to a criminal investigation. It is often used to gather information about suspects or witnesses.
- **Black Notice:** A Black Notice is issued to seek information on unidentified bodies. It is used by Interpol to assist member countries in identifying deceased individuals whose identities are unknown.
- **There are seven types of notices – Red Notice, Yellow Notice, Blue Notice, Black Notice, Green Notice, Orange Notice, and Purple Notice. Each has a different implication.**
- **Red Notice:** To seek the location and arrest of persons wanted for prosecution or to serve a sentence.
- **Yellow Notice:** To help locate missing persons, often minors, or to help identify persons who are unable to identify themselves.
- **Blue Notice:** To collect additional information about a person's identity, location or activities in relation to a criminal investigation.
- **Black Notice:** To seek information on unidentified bodies.
- **Green Notice:** To provide warning about a person's criminal activities, where the person is considered to be a possible threat to public safety.
- **Orange Notice:** To warn of an event, a person, an object or a process representing a serious and imminent threat to public safety.
- **Purple Notice:** To seek or provide information on modus operandi, objects, devices and concealment methods used by criminals.

22. Answer: c

Explanation:

- **Statement 1 is correct.** If the plant is adapted to low-light conditions, it's likely to have its stomata on the upper surface of leaves. This arrangement helps reduce water loss through transpiration by shielding the stomata from direct sunlight and wind. It's an adaptation seen in shade-tolerant plants.
- **Statement 2 is incorrect.** While important for nutrient and water uptake, a large and robust root system is not necessarily indicative of an adaptation to low-light conditions. This feature is more relevant for plants in nutrient-poor soils.
- **Statement 3 is incorrect.** Leaf trichomes are more related to water retention and protection from herbivores. They are not directly associated with light absorption in low-light conditions.
- **Statement 4 is incorrect.** This statement is not directly related to low-light adaptations. Chloroplasts are primarily present in mesophyll cells within leaves where photosynthesis occurs. Having chloroplasts in the epidermal cells of stems does not indicate a specific adaptation to low-light conditions.

23. Answer: b

Explanation:

- Tranquilizers are prescribed for anxiety, acute stress reactions, and panic attacks. Commonly known medications include **Xanax, Valium, Klonopin and Ativan**.
- **Equanil** acts as a tranquilizer. **Naproxen is analgesic**, while tetracycline and chlorpheniramine are antibiotics.
- Diphenhydramine also blocks the action of acetylcholine (anticholinergic effect) and is **used as a sedative** because it causes drowsiness.
- Omeprazole is a **proton pump inhibitor (PPI)**. It works by decreasing the amount of acid produced by the stomach. This medicine is available both over-the-counter (OTC) and with your doctor's prescription.

24. Answer: c

Explanation:

- Statement 1 is correct: The CubeSat standard, first introduced in 1999 by California Polytechnic State University and Stanford University, has indeed become a widely adopted framework for nanosatellites, ensuring compatibility and ease of integration.
- Statement 2 is correct: Nanosatellites, often referred to as CubeSats, typically weigh between 1 and 10 kilograms. Their small size and low cost have democratized access to space, enabling educational institutions and smaller organisations to participate in space missions.

- Statement 3 is correct: The QB50 project, initiated in 2012, aimed to deploy a network of CubeSats into orbit to study the lower thermosphere and ionosphere. The project involved contributions from multiple countries and institutions.

Supplementary Notes:

Nanosatellites and CubeSats:

- Nanosatellites, commonly known as CubeSats, are small satellites with standardised dimensions and components.
- The CubeSat standard includes 1U (unit), 2U, 3U, and so on, representing the size in terms of 10x10x10 cm cubes.
- CubeSats are often used for scientific research, technology demonstration, and educational purposes.
- Their compact size allows for cost-effective launches as secondary payloads on larger missions.
- The QB50 project specifically focused on deploying a constellation of CubeSats for atmospheric research, emphasising the collaborative and international nature of nanosatellite missions.

25. Answer: c

Explanation:

- **Statement 1 is correct.** This concern delves into the realm of synthetic biology and raises profound questions about the boundaries of life, the definition of consciousness, and the ethical implications of creating self-replicating entities.
- **Statement 2 is correct.** This is a complex and significant concern. As biotechnology progresses, the ethical challenges surrounding the augmentation of human capabilities, the implications for society, and the definition of "post-human" become increasingly intricate.
- **Statement 3 is incorrect.** This statement is not relevant to biotechnology. The periodic table pertains to chemical elements, and biotechnology focuses on biological systems and genetic engineering.
- **Statement 4 is correct.** While the goal of eradicating infectious diseases is laudable, this concern emphasizes the need to anticipate unforeseen consequences, societal shifts, and potential long-term effects of such drastic interventions.

26. Answer: b

Explanation:

Bisphenol A (BPA) is a synthetic compound used in the production of polycarbonate plastics and epoxy resins. The primary concern about BPA is related to its ability to mimic estrogen, a natural hormone in the human body, and disrupt hormonal balance in living organisms. This can have potential health implications, especially for vulnerable populations such as fetuses, infants, and young children. While it is true that BPA is used in plastic products, its high solubility in water is not the main reason for concern regarding its use.

27. Answer: c

Explanation:

- **Statement 1 is incorrect.** The colors observed in a soap film are primarily due to interference, not selective absorption. Interference occurs when light waves reflect from the upper and lower surfaces of the thin film, leading to constructive and destructive interference for different colors.
- **Statement 2 is incorrect.** The soap film's interference is not related to its function as a diffraction grating. Diffraction gratings involve the scattering of light due to regularly spaced slits or rulings, leading to diffraction patterns.
- **Statement 3 is correct.** The colors observed in a soap film result from the constructive and destructive interference of light waves reflected from the two surfaces of the film. The thickness of the film determines the path difference of the reflected waves and thus the interference pattern.
- **Statement 4 is incorrect.** The colors observed in a soap film are angle-dependent. The interference pattern changes as the angle of illumination or observation changes, leading to variations in the observed colors.

28. Answer: a

Explanation:

- **Statement 1 is incorrect.** The green coloration of plant leaves is primarily due to chlorophyll, and phosphorus does not play a direct role in this aspect.
- **Statement 2 is correct.** Phosphorus is essential for various physiological processes in plants, including energy transfer, root development, and cell division. Phosphorus deficiency can lead to stunted growth and poor root formation.
- **Statement 3 is incorrect.** Phosphorus is not a major component of chlorophyll; instead, magnesium is the central atom in the chlorophyll molecule. However, phosphorus is essential for energy transfer in the form of ATP (adenosine triphosphate), which is crucial for various metabolic processes, including photosynthesis.

- **Statement 4 is incorrect.** Phosphorus does not directly influence nitrogen fixation by leguminous crops. Nitrogen fixation is primarily driven by symbiotic relationships with nitrogen-fixing bacteria present in nodules on the roots of leguminous plants.

29. Answer: c

Explanation:

- **Statement 1 is correct.** Neonicotinoids have been associated with the phenomenon known as "colony collapse disorder," which involves the disruption of honeybee colonies due to factors that affect navigation and foraging behavior.
- **Statement 2 is incorrect.** Neonicotinoids do not increase the lifespan of honeybees; in fact, their impact is generally negative, affecting bee health.
- **Statement 3 is correct.** Neonicotinoids have been known to leach into soil and water, contaminating both surface water and groundwater. This can lead to unintended exposure for non-target organisms and can contribute to the overall environmental impact of these pesticides.
- **Statement 4 is correct.** Neonicotinoids are systemic pesticides, which means they are taken up by plants and can be present in various parts of the plant, including nectar and pollen. Pollinators that visit these plants can be exposed to these pesticides, which can affect their health and behavior.

30. Answer: A

Explanation:

- **Statement 1 is correct.** The SI system is the most widely used system of measurement internationally. It is based on seven base units, which are the meter (length), kilogram (mass), second (time), ampere (electric current), Kelvin (temperature), mole (amount of substance), and candela (luminous intensity).
- **Statement 2 is incorrect.** The ohm (Ω) is indeed the standard unit of electrical resistance, but it is not defined based on the resistance of a specific material. Instead, the ohm is defined in terms of fundamental electrical quantities, specifically the voltage (volt) and current (ampere).
- **Statement 3 is incorrect.** While the Kelvin (K) is the SI unit of temperature, it is not equivalent to the Celsius ($^{\circ}\text{C}$) scale. The Kelvin scale is an absolute temperature scale, where 0 K represents absolute zero (the lowest possible temperature), while the Celsius scale is based on the freezing point (0°C) and boiling point (100°C) of water at standard atmospheric pressure.
- **Statement 4 is incorrect.** The Avogadro constant (approximately 6.022×10^{23}) is the number of atoms, molecules, or particles in one mole of a substance. It is a fundamental constant in chemistry and is used as the basis for atomic mass and molecular mass calculations.

31. Answer: a

Explanation:

- **Statement 1 is correct.** Solution X shows properties consistent with being an acid.
- Conducts electricity: This indicates the presence of ions in the solution, which is a characteristic of solutions containing acids or salts.
- Sour taste: A sour taste is characteristic of acids, indicating the presence of hydrogen ions.
- Turns blue litmus paper red: A solution that turns blue litmus paper red is acidic. This observation is consistent with the sour taste and suggests the presence of H^+ ions.
- **Statement 2 is incorrect.** Solution Y shows properties consistent with being a base, but not necessarily a strong base.
- Does not conduct electricity: This indicates that the solution does not contain ions, which is a characteristic of pure water or solutions with very weak acids or bases.
- Bitter taste: A bitter taste is not typically associated with strong bases but may suggest the presence of weak bases.
- Turns red litmus paper blue: A solution that turns red litmus paper blue is basic. This observation suggests the presence of hydroxide ions.
- **Statement 3 is incorrect.**
- While Solution Z conducts electricity like a salt would, the observations of a soapy feel and turning red litmus paper blue suggest a basic nature rather than a neutral salt.
- Conducts electricity: This indicates the presence of ions in the solution, which is a characteristic of solutions containing salts or strong acids/bases.
- Soapy feel: A soapy or slippery feel is characteristic of bases, indicating the presence of OH^- ions.
- Turns red litmus paper blue: A solution that turns red litmus paper blue is basic. This observation is consistent with the soapy feel and suggests the presence of OH^- ions.

32. Answer: D

Explanation:

Statement 1 is correct: Blue light might improve visibility for predators in the area. Nocturnal predators, such as birds, spiders, or other insects, might find it easier to spot and capture fireflies in the presence of blue light. This increased predation could contribute to the decline in the firefly population.

Statement 2 is correct: Fireflies use bioluminescence signals for mating communication. Blue light could interfere with the visibility of these signals, making it difficult for fireflies to locate and attract mates. If their ability to communicate through bioluminescence is disrupted, it can lead to a decrease in successful mating and, consequently, a decline in the firefly population.

Statement 3 is correct: Different insects are attracted to different wavelengths of light. The introduction of blue light may attract a different set of insects compared to traditional yellow light. If fireflies rely on specific insects for food, a change in the insect population could result in altered food availability. This could impact the survival and reproduction of fireflies, contributing to the overall decline in their population.

Statement 4 is correct: Many organisms, including insects, have evolved under specific natural light conditions. Introducing an unnatural light spectrum, such as blue light, may cause stress to the fireflies. This stress could affect their behaviour, feeding patterns, and overall well-being. Prolonged exposure to an unnatural light spectrum might disrupt the natural physiological processes of fireflies, contributing to a decline in their population.

33. Answer: B

Explanation:

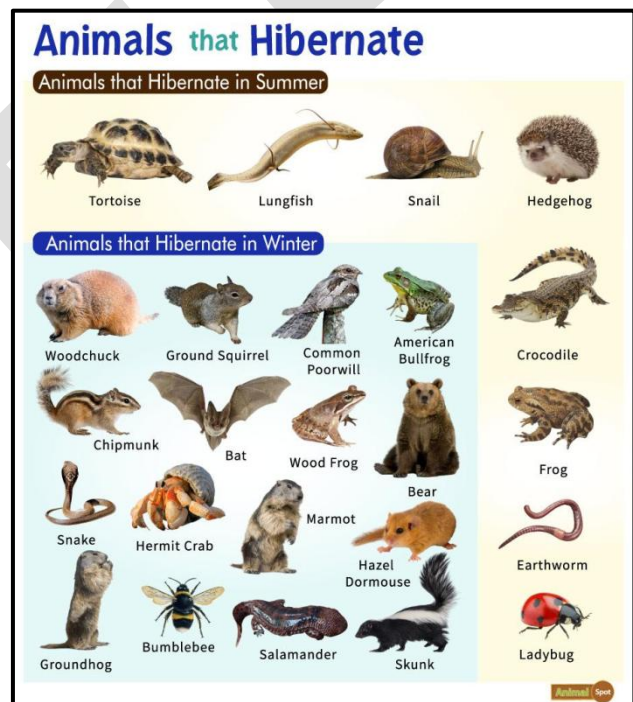
Statement 1 is incorrect: Bears are unique among hibernating mammals in that they maintain a relatively high body temperature during hibernation. While they do experience a slight decrease compared to their active state, their body temperature stays around 30°C. In contrast, small mammals like squirrels allow their body temperature to drop significantly, often close to the surrounding temperature.

Statement 2 is correct: This statement accurately highlights a distinctive adaptation in bears. To avoid expelling waste and losing valuable nutrients, bears recycle urea in their urine, converting it back into protein. This process helps them maintain a more efficient use of resources during the extended period of hibernation. Squirrels, however, do not possess this specific adaptation.

Statement 3 is correct: Squirrels undergo a pattern of hibernation called "torpor," during which they periodically awaken to raise their body temperature, consume stored food, and may even drink. This behaviour is crucial for replenishing energy reserves. Bears, on the other hand, stay in a continuous state of dormancy without waking up to eat or drink. They rely solely on their stored fat reserves for energy throughout hibernation.

Statement 4 is correct: Bears exhibit a unique reproductive strategy where they give birth and nurse their cubs inside the den during hibernation. This adaptation ensures the survival of the vulnerable cubs in a protected environment. In contrast, most other hibernating mammals give birth before entering hibernation.

Statement 5 is incorrect: Both bears and squirrels primarily rely on their stored fat reserves for energy during hibernation. Squirrels do not actively seek external food sources during this period, as they enter torpor and survive on the energy stored in their bodies.



34. Answer: C

Explanation:

Statement 1 is correct:

Rising temperatures contribute significantly to the melting of glaciers. As the temperature increases, the lower layers of glaciers start to melt, forming meltwater. This meltwater acts as a lubricant, reducing the friction between the glacier and the underlying bedrock. With less friction, the glacier can slide more easily, accelerating its movement. This phenomenon is known as basal sliding. As glaciers slide over the bedrock, they can carve out valleys and shape the landscape. The

increased sliding of glaciers due to rising temperatures also leads to higher rates of ice loss and contributes to sea-level rise. Climate change exacerbates this process, posing serious concerns for vulnerable coastal regions and ecosystems. Scientists study these interactions to understand the complex dynamics of glaciers and their response to climate change, aiming to predict future impacts on our planet's ice masses and the environment. Efforts to mitigate climate change and reduce greenhouse gas emissions are crucial in addressing this ongoing environmental challenge.

Statement 2 is incorrect:

Particles of black carbon (or soot) and dust are deposited on glacier surfaces, where they have profound effects on the ice. **These particulate pollutants reduce the albedo of the ice**, making it less reflective and more likely to absorb sunlight. As a result, the ice heats up, accelerating the melting process. Black carbon, often generated from incomplete combustion of fossil fuels and biomass, is a particularly potent contributor to this effect due to its strong light-absorbing properties.

Black carbon can travel over long distances through the atmosphere, eventually settling on remote glaciers in pristine environments. This deposition occurs through both local and global sources, including industrial activities, transportation, and wildfires. The presence of black carbon on glaciers further exacerbates the impact of climate change, leading to faster ice loss, rising sea levels, and various ecological and societal consequences.

Reducing black carbon emissions is a critical aspect of mitigating the effects of glacier melt and addressing climate change. International efforts to control black carbon emissions can help protect these vital icy landscapes and slow the rate of ice retreat, offering some respite to the fragile ecosystems and coastal communities affected by glacial retreat and sea-level rise.

Statement 3 is correct:

The slope and aspect of a glacier play a significant role in determining its exposure to sunlight, directly influencing the melting process. Glaciers with steep slopes receive more direct sunlight for longer periods throughout the day, absorbing more solar energy. This increased solar exposure causes the ice to melt at a faster rate compared to glaciers with gentler slopes, where sunlight is dispersed over a larger surface area.

Additionally, the aspect, or the direction a slope faces, affects sunlight exposure. South-facing slopes in the northern hemisphere and north-facing slopes in the southern hemisphere receive more sunlight, intensifying the melting process on these sides of the glacier.

Steep slopes also promote gravitational movement, causing the glacier to flow more rapidly. This dynamic flow, combined with increased melting due to solar exposure, contributes to the overall ice loss. Understanding these factors is crucial for scientists studying glacier behaviour and predicting the impacts of climate change on glacier retreat, sea-level rise, and water resources in affected regions.

Statement 4 is correct:

U-shaped valleys, characterized by their wide and open profiles, allow more solar radiation to reach glaciers. These valleys have steep sidewalls and a broad bottom, enabling sunlight to penetrate deeper and promote faster melting. The wide opening of U-shaped valleys enhances the exposure of the glacier to direct sunlight, leading to increased absorption of solar energy and accelerated melting rates.

In contrast, V-shaped valleys have narrower and more constricted forms, with steeper sidewalls meeting at a sharp bottom. These valleys provide less exposure to solar radiation as sunlight is obstructed by the high valley walls, limiting the amount of energy absorbed by the glacier. Consequently, glaciers in V-shaped valleys experience slower melting rates due to reduced solar exposure and absorption.

The topography of valleys significantly influences the pace of glacier melting, with U-shaped valleys amplifying the effects of solar radiation and contributing to the ongoing changes in glacier mass balance, especially in the context of global warming and climate change. Scientists study these interactions to comprehend the complex dynamics of glaciers and their responses to environmental factors, aiding in the assessment of future impacts on landscapes and water resources.

35. Answer: B

Explanation:

Arunachal Yak churpi, a traditional cheese made from yak milk in Arunachal Pradesh, has been awarded the Geographical Indication (GI) tag. This recognition highlights its unique connection to the geographical, cultural, and traditional aspects of the region. Prepared through natural fermentation, it boasts a distinct flavour profile, slightly sour and salty, and has been a dietary staple for local tribal communities for generations. The GI tag aims to protect its uniqueness by preventing the imitation of products from other regions. Rich in protein, this cheese is essential for the nutrition of those living in high-altitude areas. Beyond its nutritional value, churpi holds profound cultural significance, woven into the daily lives and traditions of the people of Arunachal Pradesh.

36. Answer: c

Explanation:

There are four Grand Slam tournaments in a year. They are also called majors.

The Grand Slam tennis in 2023 begins with the Australian Open in Melbourne on January 16. Generally happens in mid-January.

French Open, the clay court Major, is the second Slam of the year. Its official name is Roland Garros and is generally held from the end of May to the start of June.

3rd is Wimbledon, which happens from late June to early July in the UK.

The Grand Slam tennis concludes with the US Open in September.

37. Answer: C

Explanation:

Statement 1 is incorrect: Snow leopards are not larger than other Panthera cats like lions and tigers. They are relatively smaller. Adult male snow leopards typically weigh between 90 to 115 pounds, and females are generally smaller. In comparison, lions and tigers are larger and heavier members of the Panthera genus.

Statement 2 is correct: Snow leopards are known as the "ghosts of the mountains." This nickname reflects their elusive nature and the fact that their fur, which is pale and covered with spots and rosettes, provides effective camouflage in their rocky and snowy habitat. Their ability to blend into the environment makes them difficult to spot.

Statement 3 is correct: Snow leopards are highly skilled climbers. Their strong, stocky build and powerful limbs allow them to navigate the steep and rugged terrain of their mountainous habitat. While they are not known for frequently climbing trees, they are capable of doing so. Additionally, they can descend trees headfirst, showcasing their adaptability to different terrains.

Statement 4 is correct: Snow leopards are rare and elusive cats that live in the mountains of Central and South Asia. They face many threats, such as habitat loss, poaching, and climate change. Because of these factors, their population is estimated to be less than 10,000 individuals. They are classified as Vulnerable on the IUCN Red List, which means they are likely to become endangered unless their situation improves.

The snow leopard (*Panthera uncia*) is a large cat native to the mountain ranges of Central and South Asia, including the Himalayas.

Physical Features:

- Snow leopards are well-adapted to their cold mountainous habitats. They have a thick fur coat, which is usually light grey or yellowish with dark rosettes and spots.
- Their tails are long and well-developed, providing balance and serving as insulation.
- Snow leopards have large paws that act like natural snowshoes, helping them move easily through snowy terrain.

Habitat:

- They are primarily found in alpine and subalpine regions, usually at elevations between 3,000 and 4,500 meters (9,800 to 14,800 feet).
- Their range includes countries such as Afghanistan, Bhutan, China, India, Kazakhstan, Kyrgyzstan, Mongolia, Nepal, Pakistan, Russia, Tajikistan, and Uzbekistan.

Behavior:

- Snow leopards are solitary animals, and their territories can be vast, covering many square miles.
- They are elusive and well-camouflaged, making them difficult to spot in their natural habitat.
- Their diet primarily consists of blue sheep (bharal), Himalayan tahr, marmots, and other small mammals.

Conservation Status:

- Snow leopards are listed as vulnerable by the International Union for Conservation of Nature (IUCN) due to habitat loss, poaching, and conflicts with local communities.
- Conservation efforts aim to protect their habitats, reduce human-wildlife conflicts, and combat illegal poaching.

38. Answer: D**Explanation:**

Statement 1 is correct: Lab-grown fish technology has the potential to reduce the demand for traditional fish farming, which often relies on capturing wild fish for breeding or feeding. If lab-grown fish becomes a viable alternative, it could alleviate the pressure on wild fish populations and contribute to the conservation of marine ecosystems.

Statement 2 is correct: Lab-grown fish technology has the potential to revolutionize aquaculture by providing a more controlled and sustainable way to produce seafood. This technology allows for precise control over the fish's environment, reducing the risk of diseases and improving overall efficiency. It could lead to the development of innovative and environmentally friendly aquaculture practices.

Statement 3 is correct: Lab-grown fish technology could potentially democratize the seafood industry by providing opportunities for small-scale producers and entrepreneurs. The controlled and scalable nature of lab-grown fish production might enable smaller players to enter the market without the need for extensive resources typically associated with traditional fish farming.

Statement 4 is correct: The development of lab-grown fish technology may raise ethical concerns, especially if it involves genetic modification and the patenting of fish species. Issues related to the ethical treatment of animals, environmental impact, and ownership of genetic modifications could be subjects of debate and consideration.

Lab-grown fish, also known as cultured or cell-based fish, involves the production of fish meat by cultivating fish cells in a controlled environment rather than traditional methods like fishing or aquaculture. This technology has gained attention as a potential solution to address issues such as overfishing, environmental impact, and food security.

Some key aspects of lab-grown fish technology:

- **Cell Cultivation:** The process typically begins with obtaining a small sample of fish cells, often from a biopsy. These cells are then cultured in a nutrient-rich medium that provides the necessary conditions for growth and multiplication.
- **Bioreactors:** Bioreactors are used to facilitate cell growth in a controlled environment. These vessels provide the cells with the right conditions, including temperature, oxygen levels, and nutrients. The cells develop into muscle tissue, replicating the texture and flavour of conventional fish meat.
- **Sustainability:** Lab-grown fish has the potential to reduce the environmental impact associated with traditional fishing and fish farming. It could help address issues such as overfishing, habitat destruction, and the use of antibiotics in aquaculture.
- **Resource Efficiency:** Lab-grown fish have the potential to be more resource-efficient, requiring less water, land, and feed compared to traditional fisheries or aquaculture. This could contribute to more sustainable and environmentally friendly food production.
- **Animal Welfare:** Lab-grown fish production does not involve the same ethical concerns related to the treatment of live animals as conventional fishing or aquaculture. It has the potential to reduce the need for capturing and raising fish in crowded conditions.
- **Market Developments:** Several companies and startups are actively working on developing lab-grown fish products. Some are focusing on replicating the taste, texture, and nutritional profile of specific fish species. The regulatory landscape for lab-grown meat, including fish, is evolving, and agencies are working to establish guidelines for its production and sale.
- **Challenges:** Despite the promising aspects of lab-grown fish, challenges remain, including the scalability of production, cost efficiency, and consumer acceptance. Continued research and development efforts are needed to address these challenges and bring lab-grown fish to a level where they can compete with conventionally sourced fish.
- As technology advances and becomes more commercially viable, lab-grown fish have the potential to play a significant role in meeting the growing global demand for seafood while addressing sustainability and environmental concerns in the fishing industry.

39. Answer: B**Explanation:**

Agasthyagama edge is a newly discovered species of lizard belonging to the genus 'Agasthyagama'. It was first described in 2020 by a team of researchers from the University of Calicut in India. The specific epithet "edge" is a reference to the

EDGE program of the Zoological Society of London, which highlights Evolutionarily Distinct and Globally Endangered species.

Physical characteristics:

- Agasthyagama edge is a diminutive lizard with a maximum snout-vent length of 4.3 cm (1.7 inches).
- It has a uniform dull olive-brown body with a slightly darker head.
- It has a white throat adorned with a broad dark brown stripe on its dewlap, and brick yellow scales scattered on its body.
- Due to a reduced fifth toe, Agasthyagama Edge is not a skilled climber and primarily inhabits terrestrial environments with dense leaf litter.

Habitat and distribution:

- This species is endemic to the southern Western Ghats of India, specifically found in the Idukki district of Kerala.
- All records of the species so far have been at elevations between 636 and 835 meters (2,087 and 2,740 feet).
- Agasthyagama edge inhabits evergreen forests with dense leaf litter.

Diet and behaviour:

- This small lizard is an insectivore, feeding on small insects like ants, termites, and spiders.
- Agile and swift despite its small size, Agasthyagama edge uses its speed to hide within dry leaves to escape predators.
- It is a diurnal lizard, meaning it is active during the day.

Conservation status:

- Due to its recent discovery and limited information, Agasthyagama's edge is not yet assessed on the IUCN Red List.

40. Answer: C

Explanation:

If you were to travel from Shillong, the capital of Meghalaya, to the nearest point on the border of another Indian state, you would reach Assam first. Shillong is located in the northeastern part of India and is surrounded by Assam and Bangladesh.

41. Answer: D

Explanation:

Statement 1 is correct: Electric vehicles (EVs) are powered solely by electricity stored in batteries and do not have a traditional internal combustion engine. As a result, they produce zero tailpipe emissions, contributing to cleaner air quality and reducing greenhouse gas emissions. On the other hand, hybrid electric vehicles (HEVs) have both an electric motor and a gasoline engine. While they have improved fuel efficiency and lower emissions compared to traditional gasoline vehicles, they still produce some emissions from the gasoline engine, albeit typically less than conventional vehicles.

Statement 2 is correct: The environmental impact of electric vehicles (EVs) depends significantly on the source of electricity used to charge them. If the electricity comes from renewable sources such as wind, solar, or hydroelectric power, EVs have a much lower overall environmental impact compared to those charged using electricity generated from fossil fuels such as coal or natural gas. Therefore, the transition to EVs can be more environmentally beneficial in regions with a higher proportion of renewable energy in their electricity mix.

Statement 3 is correct: Hybrid electric vehicles (HEVs) incorporate an internal combustion engine and an electric motor, which work together to improve fuel efficiency. By utilizing both gasoline and electric power, HEVs can achieve better fuel economy compared to traditional internal combustion engine vehicles. This increased fuel efficiency reduces the reliance on fossil fuels and helps decrease emissions of greenhouse gases and air pollutants associated with gasoline consumption.

Statement 4 is correct: Both hybrid electric vehicles (HEVs) and electric vehicles (EVs), like all vehicles, can contribute to local air pollution through non-exhaust emissions such as brake dust. During braking, friction between brake pads and rotors or drums generates fine particles, known as brake dust, which can contain metals and other pollutants. While HEVs and EVs produce fewer emissions during driving compared to traditional vehicles, they still generate brake dust emissions, albeit potentially at lower levels due to regenerative braking systems used in these vehicles.

42. Answer: B

Explanation:

Rose - Petals: This is correct. The essential oil from the rose is primarily extracted from the petals. Rose oil is highly valued in perfumery and aromatherapy.

Clove - Leaves: This is incorrect. The essential oil from clove is primarily extracted from the flower buds, not the leaves. Clove oil is known for its aromatic and medicinal properties.

Vetiver - Roots: This is correct. Vetiver essential oil is obtained from the roots of the vetiver grass. The oil has a distinctive earthy and woody aroma.

Mint - Stems: This is incorrect. The essential oil from mint is primarily extracted from the leaves, not the stems. Mint oil is widely used for its refreshing and cooling properties.

Lavender - Flowers: This is correct. Lavender essential oil is predominantly extracted from the flowers. Lavender oil is known for its calming and soothing properties.

43. Answer: D

Explanation:

Statement 1 is correct: The Warli tribe primarily resides in the mountainous regions of the Northern Sahyadri Range, which spans parts of Maharashtra and Gujarat. Their settlements are often found in areas with undulating terrain and hilly landscapes. While they are not predominantly coastal, they do have a presence in both Maharashtra and Gujarat, with their traditional territories extending into these states.

Statement 2 is correct: The Warli language, commonly known as Varli, does not have a script of its own. Linguistically, it belongs to the southern zone of the Indo-Aryan languages. However, it's important to note that due to various historical and social factors, the Warli people often communicate in Marathi or other regional languages.

Statement 3 is correct: Warli art is known for its simplicity, using basic geometric shapes like circles, triangles, and squares. Traditionally, the artists create these paintings using a mixture of rice paste and water on walls. The art form often depicts scenes from daily life, nature, and the Warli tribe's traditional beliefs. It is a form of visual storytelling that captures the essence of their cultural and social practices.

Statement 4 is correct: Animism is a core aspect of the Warli tribe's belief system. They believe in the presence of spirits inhabiting natural elements such as trees, mountains, and other features of the landscape. Additionally, the Warli people have deities that represent different aspects of nature, and their rituals and ceremonies are closely tied to the worship of these natural entities. This spiritual connection with the environment reflects their deep-rooted understanding of the interdependence between human life and nature.

44. Answer: A

Explanation:

The Karman Line is a commonly used boundary between Earth's atmosphere and outer space. It is located at an altitude of about 100 km above sea level. The main reason for choosing this boundary is that it marks the point where the atmosphere becomes too thin for most satellites to orbit. Below this altitude, the air resistance is too high and the satellites would lose speed and fall back to Earth. Above this altitude, the satellites can orbit the Earth with minimal drag and fuel consumption.

45. Answer: B

Explanation:

One of the key features of the Paris Agreement is the "ratchet mechanism", which is designed to ensure that countries increase their efforts to reduce greenhouse gas emissions over time. The ratchet mechanism works by requiring countries to submit new or updated Nationally Determined Contributions (NDCs) every five years, starting from 2020. These NDCs are the plans that each country sets for how much they will cut their emissions by 2030 and beyond. The ratchet mechanism also requires that each successive NDC represents a progression from the previous one, and reflects the highest possible ambition that each country can achieve. This means that countries cannot lower their ambition or backtrack on their commitments, but rather have to keep raising the bar for climate action.

The ratchet mechanism is based on the principle of common but differentiated responsibilities and respective capabilities, which recognizes that different countries have different levels of development, resources, and historical responsibility for climate change. Therefore, the ratchet mechanism does not impose a uniform target or standard for all countries but rather allows each country to determine its contribution according to its national circumstances and capabilities. However, the ratchet mechanism also ensures that there is a collective effort to achieve the long-term goal of the Paris Agreement, which is to limit global warming to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels.

The ratchet mechanism is important because it creates a dynamic and flexible framework for countries to enhance their climate action over time, in response to the latest scientific findings, technological innovations, and socio-economic developments. It also creates a sense of accountability and transparency among countries, as they have to report and

review their progress and achievements regularly. The ratchet mechanism also fosters cooperation and dialogue among countries, as they can share best practices, learn from each other's experiences, and provide support and assistance to those who need it. The ratchet mechanism is, therefore, a vital tool for building trust and confidence among countries, and for ensuring that the Paris Agreement remains relevant and effective in the face of the changing realities and challenges of climate change.

46. Answer: D

Explanation:

Statement 1 is correct:

Nitrogen is an essential element for plant growth and development, especially for the synthesis of proteins and chlorophyll. Nitrogen deficiency can result in stunted growth, yellowing of leaves, and reduced yield.

Statement 2 is correct:

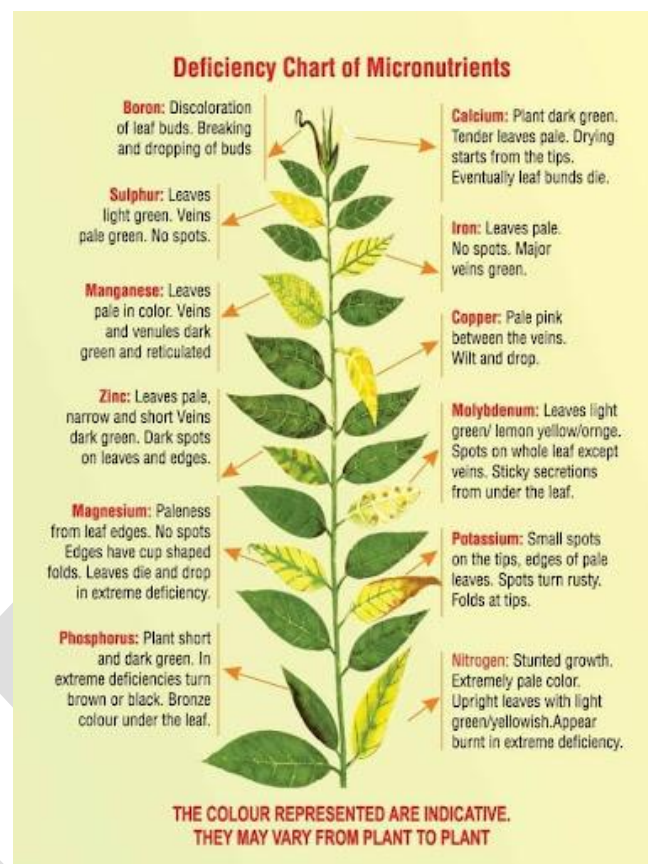
Potassium is an important element for plant water regulation, enzyme activation, and fruit quality. Potassium deficiency can result in poor fruit development, reduced size and weight, and lower sugar content.

Statement 3 is correct:

Calcium is a vital element for cell wall formation, membrane stability, and signal transduction in plants. Calcium deficiency can result in blossom-end rot, a disorder that causes the tip of the fruit to decay and turn black.

Statement 4 is correct:

Magnesium is a key element for chlorophyll production, photosynthesis, and energy metabolism in plants. Magnesium deficiency can result in chlorosis between leaf veins, a condition that causes the leaves to lose their green colour and turn yellow or white.



47. Answer: B

Explanation:

B) Only three

Pairs 3, 4, and 5 are correct, as they accurately match the active compounds in Neem, Tulsi, and Ginger, respectively. However, pairs 1 and 2 are incorrect as they misattribute Curcumin to Ashwagandha and Turmeric, respectively.

Ashwagandha: Curcumin

- Incorrect: Ashwagandha (*Withaniasomnifera*) is a medicinal herb known for its adaptogenic properties. The active compounds in Ashwagandha are called Withanolides, not Curcumin. Curcumin, on the other hand, is the active ingredient in Turmeric, not Ashwagandha.

Turmeric: Berberine

- Incorrect: Turmeric (*Curcuma longa*) contains the active compound Curcumin, not Berberine. Berberine is commonly found in plants like Barberry (*Berberis vulgaris*) and has different health benefits.

Neem: Nimbidin

- Correct: Neem (*Azadirachta indica*) is a tree known for its various medicinal properties. Nimbidin is one of the active compounds found in Neem and has been studied for its anti-inflammatory and antimicrobial properties.

Tulsi: Eugenol

- Correct: Tulsi (*Ocimum sanctum*), also known as Holy Basil, contains Eugenol as one of its active compounds. Eugenol contributes to the characteristic aroma of Tulsi and has antioxidant and anti-inflammatory properties.

Ginger: Gingerol

- Correct: Ginger (*Zingiber officinale*) contains Gingerol, a bioactive compound responsible for its pungent flavour. Gingerol has anti-inflammatory and antioxidant properties and is one of the key components contributing to the health benefits of ginger.

48. Answer: A

Explanation:

- 1. Lion and Zebra:** This is a predator-prey relationship, not mutualistic. The lion benefits by eating the zebra, but the zebra does not benefit.
- 2. Clownfish and Anemone:** This is a mutualistic relationship. The clownfish gets protection from predators, and the anemone gets cleaned by the clownfish.
- 3. Wasp and Orchid:** This is also a mutualistic relationship. The wasp benefits by getting nectar from the orchid, and the orchid benefits by getting pollinated by the wasp.
- 4. Tapeworm and Human Host:** This is a parasitic relationship. The tapeworm benefits by living off the human host, but the human host does not benefit.
- 5. Cuckoo Bird and Host Bird's Nest:** This is a parasitic relationship. The cuckoo bird benefits by laying its eggs in the host bird's nest, but the host bird does not benefit as it raises the cuckoo's chicks at the expense of its own.

Types of Interactions in the Environment:

Nature is a web of intricate relationships between living (biotic) and non-living (abiotic) components. Different types of interactions occur within this web, shaping the dynamics of entire ecosystems. Some key interactions:

1. Mutualism: Both organisms benefit from the interaction.

Examples:

- Clownfish and anemone: The clownfish protects the anemone from predators and parasites, while the anemone provides the clownfish with shelter and food scraps.
- Rhizobia bacteria and legumes: The bacteria convert atmospheric nitrogen into a usable form for the legume, while the legume provides the bacteria with carbohydrates.
- Oxpeckers and large mammals: The oxpeckers eat ticks and other parasites from the mammal's fur, while the mammal gets pest control and warning calls about approaching predators.

2. Commensalism: One organism benefits, while the other is neither helped nor harmed.

Examples:

- Remora fish and sharks: The remora attaches itself to the shark and gets a free ride and access to food scraps.
- Birds perching on trees: The bird gets a resting spot and a vantage point for hunting, while the tree is unaffected.
- Barnacles on rocks: The barnacles filter-feed on nutrients in the water, while the rock remains unchanged.

3. Predation: One organism (predator) benefits by eating another (prey), causing harm to the prey.

Examples:

- Lions and zebras: The lion hunts and eats the zebra, gaining nourishment.
- Spiders and flies: The spider captures and eats the fly in its web.
- Owls and mice: The owl hunts and eats the mouse, gaining nourishment.

4. Parasitism: One organism (parasite) benefits by living off another (host), harming the host.

Examples:

- Tapeworms in humans: The tapeworm absorbs nutrients from the human's intestines, harming the host's health.
- Ticks on dogs: The tick draws blood from the dog, weakening the host.
- Mistletoe on trees: The mistletoe steals water and nutrients from the tree, weakening the host.

Amensalism: One organism is negatively affected, while the other is unaffected.

Examples:

- Allelopathic plants: Some plants release chemicals that inhibit the growth of other plants nearby.
- Large trees shading smaller plants: The large tree blocks sunlight, hindering the growth of smaller plants beneath it.
- Antibiotics and bacteria: Antibiotics kill bacteria, while the antibiotics themselves are unaffected.

Competition: Organisms of the same or different species compete for resources like food, water, and space.

Examples:

- Lions competing for territory: Lions fight to establish dominance and access to resources within their territory.
- Trees competing for sunlight: Trees grow taller and spread their branches wider to get more sunlight.
- Herbivores competing for food: Different herbivores grazing on the same plants compete for limited food resources.

Neutralism: Two organisms interact but neither benefits nor harms the other.

Examples:

- Two different species of fish swimming past each other in the ocean.
- A bird flying over a field of deer.
- A tree and a rock exist in the same environment.

49. Answer: C

Explanation:

Statement 1 is correct: India retained its 40th rank in the Global Innovation Index 2023 rankings. This indicates India's position in terms of innovation among 132 economies worldwide.

Statement 2 is correct: The Global Innovation Index (GII) is published by the World Intellectual Property Organization (WIPO) in collaboration with Cornell University, INSEAD, and other institutions. WIPO is a reputable international organization focused on intellectual property issues, including innovation.

Statement 3 is incorrect: Switzerland ranked 1st in the Global Innovation Index 2023, not the United States. Switzerland secured the top position in the GII rankings.

Statement 4 is correct: China ranked 12th globally and remained the only middle-income economy in the top 30. This signifies China's notable position in the GII rankings and its status as a middle-income economy among the top innovative countries.

50. Answer: C

Explanation:

The Forest Department's combing operations in Mukurthi National Park and its adjoining forest areas are significant efforts to protect the park's unique ecosystem and wildlife from illegal activities, particularly poaching and unauthorized human movement. Here are more details about Mukurthi National Park:

Background

- Mukurthi National Park, initially named NilgiriTahr National Park, was officially notified as a protected area on November 7, 1990.
- It is an integral part of the Nilgiri Biosphere Reserve, which was the first Biosphere Reserve established in India.
- Situated on the western side of the Nilgiris Plateau, the park occupies an area of 78.46 square kilometres.

Flora

- The park is characterized by its diverse flora, including Shola grasslands and shrublands at high altitudes.
- Dominant plant species include Rhododendrons, raspberries, cinnamon, and blackberries.
- Mukurthi National Park is known for its endemic plant species, such as *Alchemilla indica* and *Hedyotisverticillaris*.
- Various shrubs, including *Gaultheria fragrantissima*, *Helichrysum*, and *Daphniphyllumneilgherrense*, contribute to the park's botanical richness.
- Additionally, the park is home to other plant species like *Mahonia*, *Satyrium*, eucalyptus, *Hedyotisverticillaris*, and *Impatiens* plants.

Fauna

- Mukurthi National Park is renowned for its diverse wildlife.
- The primary species of the park is the NilgiriTahr, an endangered mountain goat species.
- Besides the NilgiriTahr, the park provides a habitat for other endangered animals, including the Royal Bengal Tiger and the Asian Elephant.
- Various mammal species thrive in the park, such as Sambar, Leopard, Panthers, Nilgiri Marten, Barking Deer, Nilgiri Langur, and jackals.
- The park boasts a rich avian diversity. Notable bird species in Mukurthi National Park include the Malabar Whistling Thrush, Nilgiri Wood Pigeon, Black and Orange Flycatcher, Nilgiri Flycatcher, Parrots, Vultures, Nilgiri Pipit, and various migratory birds.
- Reptiles found in the park include the Horseshoe Pit Viper, Rat Snake, and Bronze-headed Vine Snake.

51. Answer: c

Explanation:

Pilatus PC-7 Mk II: Used for basic training, these aircraft serve as the initial stage in a cadet's flight training. 75 of these aircraft are in service with the IAF.

HAL Kiran: An intermediate jet-powered indigenous trainer aircraft.

BAE Hawk: A British jet-powered advanced trainer aircraft. The IAF currently operates 78 Kiran and 102 Hawk aircraft.

Pipistrel Virus: Used by the IAF, Navy, and National Cadet Corps as a basic trainer for Flight Safety and Air Wing Cadets. Currently, there are 194 of these aircraft in service, with 72 in the IAF.

52. Answer: A

Explanation:

Statement 1 is correct: The Indian Parliament, much like the United States' bicameral system, operates under a federal structure, signifying a division of powers between the central government and various state governments. In both India

and the U.S., the central or federal government possesses specific enumerated powers, while residual powers are left to the states, promoting a balance of authority between the two levels of government.

Statement 2 is incorrect: In UK, the Equal Franchise Act of 1928 granted equal voting rights to women and men. As a result, both men and women could vote at the age of 21.

Statement 3 is correct: This statement highlights the role of the Speaker in both the Indian Parliament and the German Bundestag, emphasizing their responsibilities in presiding over sessions, conducting proceedings, and ensuring decorum during debates and discussions.

Statement 4 is incorrect: The French Parliament is the bicameral legislature of the French Fifth Republic, consisting of the Senate (Sénat) and the National Assembly (Assemblée nationale). The Indian Parliament comprises two houses: the Lok Sabha and the Rajya Sabha. The Lok Sabha represents the people directly through elected members, similar to the French National Assembly, while the Rajya Sabha represents the states and union territories of India, acting as a council of states' representatives.

53. Answer: C

Explanation:

Statement 1 is correct: Section 6A created a special provision for Assam by which persons of Indian origin who came from Bangladesh before 1st January 1966, were deemed to be citizens of India as of that date. Persons of Indian origin who came to Assam between 1st January 1966, and 25th March 1971, and who were detected to be foreigners, were required to register themselves and were granted citizenship after 10 years of residence, subject to certain conditions. Persons who entered Assam after 25th March, 1971, were to be detected and deported in accordance with the law.

Statement 2 is incorrect: Section 6A was enacted as part of the Citizenship (Amendment) Act, 1985, following the Assam Accord of 1985.

Statement 3 is correct: Article 6 of the Indian Constitution deals with the citizenship of people who migrated from Pakistan to India during the partition. The article states that anyone who migrated to India before 19th July 1949, would automatically become an Indian citizen if either of their parents or grandparents was born in India.

Statement 4 is correct: The Citizenship Act, 1955 has been amended six times since its enactment. The amendments were made in the years 1986, 1992, 2003, 2005, 2015, and 2019.

54. Answer: B

Explanation:

Statement 1 is correct: The Election Commission is responsible for regulating the use of exit polls. According to the ECI, exit polls can only be conducted during a specific period. This period starts from the time when the polling booths close and ends 30 minutes after the last booth has closed.

Statement 2 is incorrect: Section 126A of the Representation of the People Act, 1951 prohibits conduct of Exit poll and dissemination of their results by means of print or electronic media during the period mentioned therein, i.e. between the hour fixed for commencement of poll in the first phase and half an hour after the time fixed for close of poll for the last phase in all the States.

Statement 3 is correct: In addition to the ban on the publication of exit polls, the ECI also requires that all media outlets that conduct exit polls must register with the commission.

55. Answer: A

Explanation:

- Elephant was adopted as the symbol (seal) of the Constituent Assembly.
- Sir B.N. Rau was appointed as the constitutional advisor (Legal advisor) to the Constituent Assembly.
- H.V.R. Iyengar was the Secretary to the Constituent Assembly.
- S.N. Mukerjee was the chief draftsman of the constitution in the Constituent Assembly.
- Prem Behari Narain Raizada was the calligrapher of the Indian Constitution. The original constitution was handwritten by him in a flowing italic style.
- The original version was beautified and decorated by artists from Shantiniketan including Nand Lal Bose and Beohar Rammanohar Sinha.
- Beohar Rammanohar Sinha illuminated, beautified and ornamented the original Preamble calligraphed by Prem Behari Narain Raizada.
- The calligraphy of the Hindi version of the original constitution was done by Vasant Krishan Vaidya and elegantly decorated and illuminated by Nand Lal Bose.

56. Answer: B

Explanation:

The given Assertion (A) is incorrect. In the case of *Joseph Shine vs Union of India* (2018), the Supreme Court actually struck down Section 497, which treated adultery as a criminal offense with a gender-specific approach. The court ruled that it was unconstitutional to solely penalize men for adultery, thus decriminalizing adultery altogether.

Regarding the Reason (R), it is also incorrect. The proposed *Bharatiya Nyaya Sanhita* (BNS), 2023, suggests reinstating adultery as a criminal offense, but it intends to make it gender-neutral, unlike the previous Section 497. The proposal aims to rectify the gender bias present in the earlier law by making the provision equally applicable to both men and women engaging in adultery.

57. Answer: C**Explanation:**

1. Sarkaria Commission (1988):

- Appointment: The governor should be appointed by the President after consultation with the Chief Minister of the concerned state.
- Non-Residence: The governor should be a person of eminence in some field of public life and should not belong to the state where they are appointed.
- Tenure: The governor should not be removed before completing their term except in rare and compelling circumstances.
- Bridge Role: The governor should act as a bridge between the center and the state, not merely as an agent of the center.
- Discretionary Powers: The governor should exercise discretionary powers sparingly and judiciously, avoiding their use to undermine the democratic process.

2. Venkatachaliah Commission (2002):

- Appointment Committee: Recommended a committee comprising the Prime Minister, Home Minister, Speaker of the Lok Sabha, and Chief Minister of the concerned state for the appointment of governors.
- Tenure: Governors should be allowed to complete their five-year term, unless they resign or are removed by the President due to proven misbehavior or incapacity.
- Consultation: The central government should consult the Chief Minister before taking any action to remove the governor.
- Role: Governors should not interfere in the day-to-day administration of the state but rather act as a friend, philosopher, and guide to the state government. Discretionary powers should be used sparingly.

3. Punchhi Commission (2010):

- Removal Process: Suggested removing the phrase "during the pleasure of the President" from the Constitution, implying that governors cannot be removed at the will of the central government.
- Removal via State Legislature: Proposed that a governor should only be removed by a resolution of the state legislature, providing more stability and autonomy for the states.

58. Answer: A**Explanation:**

- Relativistic Morality pertains to the belief that moral principles and values are context-dependent and may vary across cultures or individuals. Those advocating for inclusive language likely follow this viewpoint, emphasizing the importance of respecting diverse linguistic backgrounds and accommodating different cultural sensitivities.
- Absolutist Morality, on the other hand, adheres to fixed moral principles and standards that apply universally and should not be compromised. Those opposing the policy proposal might subscribe to this perspective, emphasizing the preservation of traditional language norms and cultural heritage as paramount.
- The contrasting viewpoints in the scenario—favoring inclusive language versus upholding traditional language norms—reflect the clash between Relativistic Morality (valuing contextual sensitivity and diversity) and Absolutist Morality (adhering to fixed principles and cultural heritage). These differing moral outlooks underpin the debate regarding the proposed policy on language usage in public spaces.

59. Answer: C**Explanation:**

Article 51A of the Indian Constitution enumerates the Fundamental Duties of citizens towards the nation. In this context:

Article 51A(g): It states that it is the duty of every citizen to protect and improve the natural environment, including forests, lakes, rivers, and wildlife, and to have compassion for living creatures.

Article 51A(h): It emphasizes that citizens should develop a scientific temper, humanism, and the spirit of inquiry and reform.

The scenario portrays a situation where a rural community faces severe environmental degradation due to irresponsible waste disposal practices by an industrial unit. The adverse impact on the villagers' health and livelihood necessitates urgent actions to address the environmental concerns and safeguard public health.

Referring to Article 51A(g), the affected villagers can assert their Fundamental Duty to protect and improve the natural environment. By urging authorities to address the issue of environmental degradation caused by the industrial unit's activities, the villagers can emphasize the importance of conserving the environment and its impact on their well-being, aligning with their Fundamental Duty as citizens.

Additionally, invoking Article 51A(h) by fostering a scientific temper and seeking solutions to address the environmental challenges through inquiry and reform could further empower the community to actively engage with authorities and advocate for responsible waste management practices.

Therefore, in the given scenario, the affected villagers can refer to Article 51A(g) and Article 51A(h) of the Indian Constitution to highlight their Fundamental Duties towards environmental protection, public health, and the need for responsible waste management practices.

Article 51A(a): It emphasizes that it is the duty of every citizen to abide by the Constitution and respect its ideals and institutions, the National Flag, and the National Anthem.

Article 51A(b): It underlines the duty of citizens to cherish and follow the noble ideals that inspired India's freedom struggle.

60. Answer: D

Explanation:

The appointment of various constitutional authorities is done by the President of India.

- The Prime Minister (Article 75),
- The Attorney-General for India (Article 76),
- The Chairman and other members of the Finance Commission (Article 280),
- The Chairman and other members of the Public Service Commission (Article 316), and
- A Special Officer for Linguistic Minorities (Article 350B)

However, the appointments done by the President using the words 'shall be appointed by the President by warrant under his hand and seal'.

- Judges of the Supreme Court and the High Court (Articles 124 and 217)
- The CAG (Article 148)
- The Governor (Article 155)
- The same words have been used in Articles 338, 338A, and 338B authorising the President for appointing Chairman and members of the National Commissions for SCs, STs, and BCs

61. Answer: A

Explanation:

Statement 1 is incorrect: A chargesheet, as defined under Section 173 CrPC, is the final report prepared by a police officer or investigative agency after completing their investigation of a case.

Statement 2 is correct: According to the Court, a chargesheet cannot be made publicly available as it's not a 'public document' under Sections 74 and 76 of the Evidence Act, 1872.

Statement 3 is incorrect: The Supreme Court in the Youth Bar Association of India vs Union of India case (2016) directed all police stations in the country to publish copies of FIRs online within 24 hours of registration, except in cases where offenses were of sensitive nature. Only FIRs were covered by this ruling, and chargesheets were not included.

62. Answer: C

Explanation:

The Parliament (Prevention of Disqualification) Act, 1959 exempts several posts from disqualification, like:

- Ministers of State and Deputy Ministers,
- Parliamentary Secretaries and Parliamentary Under Secretaries,
- Deputy Chief Whips in Parliament,
- Vice-Chancellors of Universities,
- Officers in the National Cadet Corps, and the Territorial Army, and
- Chairman and members of Advisory Committees set up by the Government when they are not entitled to any fee or remuneration other than compensatory, etc.

63. Answer: C

Explanation:

Statement 1 is incorrect: As per, 2011 Linguistic census, there are 121 mother tongues in India.

Statement 2 is incorrect: Bengali (9.72 crore individual and 8% population) is 2nd most spoken language in India.

Statement 3 is incorrect: International Mother Language Day is observed on 21st February every year. It was declared by UNESCO. It is in tribute to the Language Movement and the ethnolinguistic rights of people around the world.

64. Answer: D

Explanation:

The question revolves around identifying the social democratic model that emphasizes a balance between economic growth and social welfare while avoiding extensive government intervention.

A) Party A advocates for the Nordic Model, which prioritizes a comprehensive welfare state and substantial government intervention in social programs. It may not strike a perfect balance as it leans more towards a robust welfare system with higher taxation.

B) Party B supports the Rhineland Model, which emphasizes collaborative efforts between the government, businesses, and unions but doesn't entirely focus on avoiding government intervention, making it less likely to strike a perfect balance between growth and welfare without significant intervention.

C) Party C's Mediterranean Model corresponds to southern European countries who developed their welfare state later than the previous ones (during the 1970s and 1980s). It is the model with the lowest share of expenditures and is strongly based on pensions and a low level of social assistance. There exists in these countries a higher segmentation of rights and status of persons receiving subsidies which has as one of its consequences a strongly conditioned access to social provisions.

D) Given the analysis, none of the presented models – Nordic, Rhineland, or Mediterranean – entirely prioritize a balance between economic growth and social welfare without significant government intervention.

Therefore, the most suitable answer would be: D) None of the above

65. Answer: b

Explanation:

Statement 1 is correct: Mosaic, developed by NCSA in 1993, is indeed considered the first widely used graphical web browser.

Statement 2 is correct: Lynx is a text-based browser that operates in a command-line interface, devoid of graphical content.

Statement 3 is incorrect: Opera was not the first web browser to introduce tabbed browsing. This feature was introduced by the browser NetCaptor in 1997, while Opera introduced tabbed browsing in version 4.0 in 2000.

66. Answer: C

Explanation:

The PM Vishwakarma Scheme, launched by the Prime Minister, is a comprehensive initiative aimed at supporting traditional artisans and craftsmen in India. By providing financial assistance, skills training, toolkits, and interest-free loans, the scheme intends to enhance the livelihoods of these artisans and promote traditional crafts.

Key highlights and components of the scheme:

- **It is a Central Sector Scheme**, that aims to provide collateral-free loans and skills training to 18 categories of traditional artisans and crafts persons. The scheme has a total outlay of Rs 13,000 crore over five years, spanning until 2027-28.
- The objective is to provide financial assistance, skills training, and toolkits to traditional artisans and craftsmen, enhancing their craft and livelihoods.
- **The Ministry of Micro, Small & Medium Enterprise is the nodal ministry** for the PM Vishwakarma Yojana.
- **Components of the Scheme:**
 - Beneficiaries will attend a five-day skilling workshop.
 - **Artisans will receive a voucher of Rs 15,000 to purchase necessary tools for their craft.**
 - **Artisans can avail themselves of an interest-free loan of Rs 1 lakh, repayable within 18 months. Upon repayment, they qualify for a second loan of Rs 2 lakh at an interest rate of 5 percent.**
 - Beneficiaries will receive a subsidy of up to 8 percent of the interest amount.
 - The scheme offers guarantee-free loans.
- Verification of beneficiaries will take place at the gram panchayat, district collector, and state levels.

- A concessional interest rate of 5 percent will be charged from the beneficiary, with an interest subvention cap of 8 percent paid by the Ministry of Micro Small and Medium Enterprises.
- The scheme is expected to benefit around 30 lakh families of traditional artisans and craftsmen, including weavers, goldsmiths, blacksmiths, laundry workers, and barbers.
- Beneficiaries will receive a PM Vishwakarma certificate and ID card to recognize their skills and craftsmanship.
- The scheme aims to strengthen and preserve the traditional teacher-pupil tradition or family-based practice of traditional skills among artisans and craftspeople.
- The scheme is designed to benefit Scheduled Castes, Scheduled Tribes, OBCs, women, and people belonging to weaker sections of society.

67. Answer: A

Explanation:

'Air Quality Life Index (AQLI) Annual Update 2023'

- The report on air quality in South Asia, as highlighted by the 'Air Quality Life Index (AQLI) Annual Update 2023' from the University of Chicago's Energy Policy Institute, sheds light on a severe and pressing issue affecting the region.
- Air pollution is causing a staggering reduction in the average lifespan of individuals in South Asia. On average, it is reducing life expectancy by 5.1 years across the region. Bangladesh, India, Nepal, and Pakistan collectively account for more than half of the global life years lost due to high pollution.
- Poor air quality has a more significant impact on life expectancy in South Asia than other major health threats. It diminishes life expectancy by an average of 5.3 years per person in India, while cardiovascular diseases reduce it by around 4.5 years and child and maternal malnutrition by 1.8 years. Notably, air pollution's impact on life expectancy is even greater than tobacco use, which reduces it by up to 2.8 years.
- Air pollution levels have been steadily rising in South Asia. The average person in the region now experiences particulate pollution levels that are 51.3% higher than those in 2000. If pollution levels had remained constant since 2000, residents would have faced a loss of 3.3 years in life expectancy, compared to the 5.2 years projected for 2021.
- Country-specific Impact:
 - **Bangladesh: Ranked as the most polluted country globally**, with an average life expectancy reduction of 6.8 years per person.
 - **India:** The second most polluted nation, with the entire population living in areas exceeding WHO guidelines for particulate pollution. Particulate pollution increased by 67.7% over the years, leading to a decline in average life expectancy by 2.3 years. Some areas in India have pollution levels that are ten times the WHO guideline.
- Rapid industrialization, economic development, population growth, increased energy demand, and the use of fossil fuels, along with a surge in the number of vehicles and a significant rise in electricity production from fossil fuels, have contributed to higher pollution levels.
- Air pollution, particularly PM2.5 particles, which are tiny and easily enter the circulatory system, is associated with chronic diseases such as asthma, heart attacks, bronchitis, and respiratory problems.

68. Answer: B

Explanation:

Statement 1 is correct: The Public Servants (Inquiries) Act 1850 is a legal enactment in India that empowers the government to inquire into allegations of misconduct or inefficiency against public servants. This Act provides the legal framework for conducting inquiries into the conduct and performance of government employees. It helps ensure accountability, integrity, and transparency in the functioning of the public service. The Act's provisions could apply to various government departments and organizations, both at the central and state levels.

Statement 2 is correct: The Indian Penal Code, 1860 (IPC) is the main criminal code of India. It is comprehensive legislation that defines various types of criminal offences and prescribes the punishments for those offences. The IPC covers the concepts of criminal attempt and abetment. Attempt refers to the act of trying to commit a crime without succeeding, while abetment involves aiding, instigating, or encouraging another person to commit an offence.

Statement 3 is incorrect: The Maternity Benefit (Amendment) Act (2017) is a landmark legislation that aims to improve the working conditions and welfare of women employees in India. The Act has increased the duration of paid maternity leave from 12 weeks to 26 weeks, making India one of the countries with the longest maternity leave in the world. The Act also mandates that employers provide work-from-home options and crèche facilities for women who return to work after their maternity leave. These provisions are expected to enhance the participation and retention of women in the workforce, as well as promote their health and well-being.

Statement 4 is incorrect: The Mental Healthcare Act (2017) is a legislation that aims to protect and promote the mental health and well-being of people who suffer from mental disorders. It recognizes the right of every person with mental illness to access quality mental healthcare and treatment without discrimination or stigma. It also abolishes the criminal liability for attempting suicide and ensures that such persons receive proper care and support.

69. Answer: d

Explanation:

The National Investigation Agency (NIA) has a broad jurisdiction when it comes to investigating and prosecuting specific types of cases. The agency was established to deal with matters related to national security and terrorism. Here's a detailed overview of the jurisdiction of the NIA:

1. **Terrorism and Related Offenses:** The NIA's primary jurisdiction lies in investigating and prosecuting cases related to terrorism and terrorist activities. This includes acts of terrorism, conspiracy to commit acts of terrorism, and membership in terrorist organizations. The agency is empowered to handle cases involving attacks on the sovereignty and integrity of India, and its focus is on addressing threats to national security.
2. **Offenses with Transnational Implications:** The NIA has jurisdiction over cases that have transnational implications or cross-border dimensions. This means that if an offence is committed in India but has connections to individuals, groups, or entities outside the country, the NIA can investigate and take action against those involved.
3. **Attacks on Nuclear Installations and Materials:** The NIA is responsible for investigating offences related to attacks on nuclear installations and materials. This involves cases where there is a threat to the security of nuclear facilities or materials that could potentially have serious consequences for national security.
4. **Counterfeit Currency Offenses:** The agency is authorized to investigate cases involving counterfeit currency, which poses a threat to the economy and financial stability of the country.
5. **Human Trafficking Offenses:** The NIA's jurisdiction extends to cases of human trafficking, especially those that have a national security angle or involve organized crime networks.
6. **Unlawful Activities of Associations:** The NIA can investigate and prosecute offences related to the unlawful activities of associations or groups that threaten national security or engage in terrorist activities.
7. **Cyber-Terrorism and Cyber-Crime:** In recent years, the NIA's jurisdiction has also expanded to include cases related to cyber-terrorism and cyber-crime, especially when these activities have national security implications.
8. **Special Courts:** For cases falling under its jurisdiction, the NIA is responsible for investigating the matter thoroughly and preparing a solid case for prosecution. Special courts designated by the central government exclusively handle cases investigated by the NIA. These courts ensure that the trials are conducted efficiently and effectively, leading to timely justice.
9. **Coordination and Collaboration:** While the NIA has its jurisdiction, it often collaborates and coordinates with other law enforcement agencies, intelligence agencies, and international organizations to address complex and transnational cases effectively.

70. Answer: b

Explanation:

The Cocos Plate is an oceanic tectonic plate located in the eastern Pacific Ocean off the west coast of Central America. It is situated between the Pacific Plate to the west and the North American Plate to the east. The boundary between the Cocos Plate and the Pacific Plate is characterized by subduction, where the denser Cocos Plate is being pushed beneath the lighter Pacific Plate. This subduction zone is associated with seismic activity, including earthquakes and volcanic eruptions, along the Pacific Ring of Fire.

The Nazca Plate is an oceanic tectonic plate located in the southeastern Pacific Ocean. It is situated between the South American Plate to the east and the Pacific Plate to the west. The boundary between the Nazca Plate and the South American Plate is a convergent boundary, where the Nazca Plate is subducting beneath the South American Plate along the Peru-Chile Trench. This subduction zone is associated with the formation of the Andes Mountains and frequent seismic activity, including earthquakes and volcanic eruptions.

The Caroline Plate is a small tectonic plate located in the western Pacific Ocean. It is situated between the Philippine Sea Plate to the east and the Indian Plate to the west. The Caroline Plate is part of the complex tectonic boundary region in the western Pacific known as the Philippine Sea Plate system. It is bounded by several major tectonic plates, including the Philippine Sea Plate, Pacific Plate, and Eurasian Plate. The boundaries between these plates are characterized by complex interactions, including subduction zones, transform faults, and spreading centers, resulting in significant seismic and volcanic activity in the region.

The Juan de Fuca Plate is a small tectonic plate located in the northeastern Pacific Ocean. It lies to the west of the North American Plate and is part of the larger Pacific Plate system. The boundary between the Juan de Fuca Plate and the North American Plate is a transform boundary, where the two plates slide past each other horizontally along the Juan de Fuca Ridge and the associated Juan de Fuca Ridge Transform Fault. This boundary extends from northern California to the southern coast of British Columbia, Canada.

71. Answer: b

Explanation:

Name	State	Mountain Range
Batura Glacier	Jammu & Kashmir	Karakoram Mountain Range
Khurdopin Glacier	Jammu & Kashmir	Karakoram Mountain Range
Hispar Glacier	Jammu & Kashmir	Karakoram Mountain Range
Biafo Glacier	Jammu & Kashmir	Karakoram Mountain Range
Baltoro Glacier	Jammu & Kashmir	Karakoram Mountain Range
Chomolungma glacier	Jammu & Kashmir	Karakoram Mountain Range
Khurdapin glacier	Ladakh	Karakoram
Godwin Austen	Ladakh	Karakoram
Trango Glacier	Ladakh	Karakoram
Chong Kumdan	Ladakh	Karakoram
Diamir Glacier	Jammu & Kashmir	Karakoram Mountain Range
Siachen Glacier	Jammu & Kashmir	Karakoram Mountain Range
Bara Shigri Glacier	Himachal Pradesh	Pir Panjal Range of the Inner Himalayas.
Chhota Shigri Glacier	Himachal Pradesh	Pir Panjal
Sonapani Glacier	Himachal Pradesh	Pir Panjal
Rakhiot Glacier	Ladakh	Pir Panjal
Gangotri Glacier	Uttarkashi, Uttarakhand	Himalayas
Bandarpunch Glacier	Uttarakhand	The western edge of the high Himalayan range
Milam Glacier	Uttarakhand	Trishul Peak of Pithoragarh
Pindari glacier	Nanda Devi, Uttarakhand	Upper reaches of the Kumaon Himalayas
Kafni Glacier	Uttarakhand	Kumaon-Garhwal
Kalabaland Glacier	Uttarakhand	Kumaon-Garhwal
KedarBamak Glacier	Uttarakhand	Kumaon-Garhwal
Meola Glacier	Uttarakhand	Kumaon-Garhwal
Namik Glacier	Uttarakhand	Kumaon-Garhwal
Panchchuli Glacier	Uttarakhand	Kumaon-Garhwal
Ralam Glacier	Uttarakhand	Kumaon-Garhwal
Sona Glacier	Uttarakhand	Kumaon-Garhwal
Satopanth Glacier	Uttarakhand	Kumaon-Garhwal
Sunderdhunga Glacier	Uttarakhand	Kumaon-Garhwal
Dokriani Glacier	Uttarakhand	Kumaon-Garhwal
Chorabari Glacier	Uttarakhand	Kumaon-Garhwal
Zemu Glacier	Sikkim	Eastern Himalaya Located on Kanchenjunga peak
Kanchenjunga Glacier	Sikkim	Eastern Himalaya

72. Answer: a

Explanation:

- Strait of Gibraltar: Connects the Mediterranean Sea to the Atlantic Ocean, between Spain and Morocco.
- Bosphorus Strait: Connects the Black Sea to the Sea of Marmara, separating Europe (Turkey) and Asia (Turkey).
- Dardanelles Strait: Connects the Aegean Sea to the Sea of Marmara, also in Turkey.
- Strait of Malacca: Connects the Andaman Sea to the South China Sea, between the Malay Peninsula and Sumatra.
- Hormuz Strait: Connects the Persian Gulf to the Gulf of Oman and the Arabian Sea, between Iran and Oman.
- Karimata Strait: Connects the South China Sea to the Java Sea, between Sumatra and Borneo.
- Torres Strait: Connects the Coral Sea to the Arafura Sea, between Australia and New Guinea.
- Tsugaru Strait: Connects the Sea of Japan to the Pacific Ocean, between Honshu and Hokkaido in Japan.

- Dover Strait: Connects the English Channel to the North Sea, between England and France.
- Cook Strait: Separates the North Island and South Island of New Zealand, connecting the Tasman Sea to the Pacific Ocean.
 - Taiwan Strait: Separates Taiwan from the southeastern coast of China, connecting the East China Sea to the South China Sea.
 - Malacca Strait: Connects the Andaman Sea to the South China Sea, between the Malay Peninsula and Sumatra.
 - Lombok Strait: Connects the Java Sea to the Indian Ocean, between Bali and Lombok in Indonesia.
 - Gibraltar Strait: Connects the Mediterranean Sea to the Atlantic Ocean, between Spain and Morocco.
 - Bering Strait: Separates Russia and Alaska, connecting the Arctic Ocean to the Bering Sea.
 - Formosa Strait (Taiwan Strait): Connects the East China Sea to the Philippine Sea, between Taiwan and the Philippines.
 - Cook Strait: Separates the North Island and South Island of New Zealand, connecting the Tasman Sea to the Pacific Ocean.
 - Yucatan Strait: Connects the Gulf of Mexico to the Caribbean Sea, between Mexico and Cuba.
 - Florida Strait: Connects the Gulf of Mexico to the Atlantic Ocean, between Florida (USA) and Cuba.
 - Korea Strait: Separates South Korea and Japan, connecting the East China Sea to the Sea of Japan.
 - Mozambique Channel: Separates Madagascar from the eastern coast of Africa, connecting the Indian Ocean to the Mozambique Channel.
 - Palk Strait: Separates the northeastern coast of Sri Lanka from the southern tip of India, connecting the Bay of Bengal to the Gulf of Mannar.
 - Gulf of Aden: Connects the Arabian Sea to the Red Sea, between Yemen and Somalia.
 - Windward Passage: Connects the Atlantic Ocean to the Caribbean Sea, between Cuba and Haiti.
 - Kerch Strait: Connects the Black Sea to the Sea of Azov, between Crimea (Russia) and the Taman Peninsula (Russia).
 - La Perouse Strait: Separates the Russian island of Sakhalin from Hokkaido in Japan, connecting the Sea of Japan to the Sea of Okhotsk.
 - Mackinac Strait: Connects Lake Michigan and Lake Huron, separating Michigan's Upper and Lower Peninsulas (USA).
 - Dixon Entrance: Separates Alaska (USA) and British Columbia (Canada), connecting the Pacific Ocean to the Hecate Strait.
 - Cook Inlet: Connects the Gulf of Alaska to Anchorage in Alaska (USA).
 - San Juanico Strait: Connects the Visayan Sea to the Samar Sea, between Leyte and Samar islands in the Philippines.

73. Answer: b

Explanation:

- An anticyclone is a region of high atmospheric pressure characterised by descending air. As the air descends, it warms and inhibits the formation of clouds and precipitation.
- Anticyclones can influence large areas of the atmosphere, affecting weather patterns and conditions over vast regions.
- Anticyclones feature descending air, leading to high pressure at the Earth's surface.
- Winds circulate clockwise around the central region of high pressure in the Northern Hemisphere and counter clockwise in the Southern Hemisphere.
- They are associated with clear skies, cooler temperatures, and drier air at the surface.
- Fog formation is common overnight within regions of higher pressure due to subsidence and stable air conditions.

74. Answer: b

Explanation:

<u>MINERAL</u>	<u>MINES</u>	<u>TOP PRODUCERS (STATES)</u>	<u>TOP PRODUCERS (COUNTRIES)</u>
IRON ORE	Barabil – Koira Valley (Odisha) Bailadila Mine (Chhattisgarh) Dalli-Rajhara (CH) – the largest mine in India	1. Odisha 2. Chhattisgarh 3. Karnataka	1. Australia 2. Brazil 3. China 4. India

MANGANESE	Balaghat – Madhya Pradesh Nagpur – Bhandara Region (Maharashtra) Gondite Mines (Orissa) Khondolite deposits (Orissa)	1. Madhya Pradesh 2. Maharashtra 3. Odisha	1. South Africa 2. Australia 3. China
CHROMITE	Sukinda Valley (Orissa) Hasan Region (Karnataka)	1. Odisha 2. Karnataka 3. Andhra Pradesh	1. South Africa 2. Kazakhstan 3. India
NICKEL	Sukinda Valley (Orissa) Singhbhum Region (Jharkhand)	1. Odisha 2. Jharkhand	1. Indonesia 2. Philippines 3. Canada
COBALT	Singhbhum Region (Jharkhand) Kendujhar (Orissa) Tuensang (Nagaland)	1. Jharkhand 2. Odisha 3. Nagaland	1. Democratic Republic of Congo 2. Russia 3. Australia
BAUXITE	Balangir(Orissa) Koraput (Orissa) Gumla(Jharkhand) Shahdol (Madhya Pradesh)	1. Odisha 2. Jharkhand 3. Gujarat	1. Australia 2. China 3. Brazil
COPPER	Malanjkhand Belt (Madhya Pradesh) Khetri Belt (Rajasthan) Kho-Dariba (Rajasthan)	1. Madhya Pradesh 2. Rajasthan 3. Jharkhand	1. Chile 2. Peru 3. China
GOLD	Jamui District (Bihar) (Still exploring) Kolar Gold Field (Karnataka) Hutti Gold Field (Karnataka) Ramagiri Mines (Andhra Pradesh) Sunarnarekha Sands (Jharkhand)	1. Bihar 2. Rajasthan 3. Karnataka 4. West Bengal	1. China 2. Australia 3. Russia
SILVER	Zawar Mines (Rajasthan) Tundoo Mines (Jharkhand) Kolar Gold Fields (Karnataka)	1. Rajasthan 2. Jharkhand 3. Andhra Pradesh 4. Karnataka	1. Mexico 2. Peru 3. China
LEAD	Rampura Aghucha (Rajasthan) Sindesar Mines (Rajasthan)	1. Rajasthan 2. Andhra Pradesh 3. Madhya Pradesh	1. China 2. Australia 3. USA
TIN	Dantewada (Chhattisgarh)	Chhattisgarh (the only state in India)	1. China 2. Indonesia 3. Peru
MAGNESIUM	Chalk Hills (Tamilnadu) Almora (Uttarakhand)	1. Tamil Nadu 2. Uttarakhand 3. Karnataka	1. China 2. Russia 3. Turkey
LIMESTONE	Jabalpur (Madhya Pradesh) Satna (Madhya Pradesh) Cuddapah (AP)	1. Madhya Pradesh 2. Rajasthan	1. China 2. USA 3. India
MICA	Gudur Mines (Andhra Pradesh) Aravalis (Rajasthan) Koderma (Jharkhand)	1. Andhra Pradesh 2. Rajasthan 3. Orissa	1. China 2. Russia
DOLOMITE	Bastar, Raigarh (Chhattisgarh) Birmitrapur (Orissa) Khammam Region (Andhra Pradesh)	1. Chattisgarh 2. Andhra Pradesh	1. China 2. Belgium 3. Spain
ASBESTOS	Pali (Rajasthan) – largest mine Cuddapah (Andhra Pradesh)	1. Rajasthan 2. Andhra Pradesh 3. Karnataka	1. Russia 2. China

KYANITE	Pavri Mines (Maharashtra) – Oldest kyanite mine in India. Nawargaon Mines (Maharashtra)	1. Jharkhand 2. Maharashtra 3. Karnataka	1. USA 2. China 3. Japan
GYPSUM	Jodhpur, Bikaner, Jaisalmer-Rajasthan	1. Rajasthan 2. Tamil Nadu 3. Gujarat	1. USA 2. China 3. Iran
DIAMOND	Majhgawan Panna Mines (Madhya Pradesh) – only active diamond mine in India	1. Madhya Pradesh – only diamond-producing state	1. Russia 2. Botswana 3. Democratic Republic of Congo
COAL	Korba Coalfield, Birampur –Chhattisgarh Jharia Coalfield, Bokaro Coalfield, Girdih –(Jharkhand) Talcher field – (Orissa) Singaruli coalfields (Madhya Pradesh)	1. Jharkhand 2. Orissa 3. Chattisgarh	1. China 2. USA 3. India
PETROLEUM	Lunej, Ankleshwar, Kalol-Gujarat Mumbai high-Maharashtra – largest oil field Digboi-Assam–Oldest oil field in India	1. Maharastra 2. Gujarat	1. USA 2. Saudi Arabia 3. Russia
URANIUM	Jaduguda mine (Jharkhand) Tummalapalle mine (Andhra Pradesh) – largest mine. Domiasiat Mine (Meghalaya)	1. Andhra Pradesh 2. Jharkhand 3. Karnataka	1. Kazakhstan 2. Canada 3. Australia
THORIUM		1. Kerala 2. Jharkhand 3. Bihar	1. Australia 2. USA 3. India

75. Answer: d

Explanation:

Landlocked countries may be bordered by a single country with direct access to the high seas, two or more such countries, or be surrounded by other landlocked countries, making a country doubly landlocked. Among the examples of landlocked countries are Lesotho, San Marino, and Vatican City, each surrounded by a single country. Additionally, there are seven landlocked countries bordered by only two neighboring nations, such as Andorra, Bhutan, and Nepal. Notably, Liechtenstein and Uzbekistan are considered doubly landlocked as they are surrounded exclusively by landlocked countries, requiring the crossing of at least two national borders to reach a coastline.

76. Answer: c

Explanation:

Household investments in real estate have played a significant role in bolstering the investment rate. The household sector, which constitutes the largest share in the total Gross Fixed Capital Formation, experienced a rising trajectory in investment just before the pandemic. This increase was fueled by a gradual decline in growth in real-estate prices and a continued rise in bank credit for housing. Despite the onset of the pandemic, housing prices have begun to recover, with average annual growth in real-estate prices increasing from 2.3% in FY22 to 3.8% in FY23 and 4.3% in H1 of FY24. Additionally, there has been an uptrend in housing sales and launches, indicating optimism about the future and the recovery of incomes, despite the appreciation in real-estate prices and higher interest rates.

77. Answer: d

Explanation:

Nano-DAP contains 8% nitrogen and 16% phosphorus, not 18% nitrogen and 46% phosphorus.

The cost of a 500 ml bottle of Nano-DAP is lower than a 50kg bag of conventional DAP, even without subsidies. IFFCO has received the patent for their nano variants from the Indian government for a period of 20 years. Nano-DAP is mentioned as the second product from the nano stable after Nano Urea, implying that there is another nanotechnology-based agri-input developed by IFFCO.

78. Answer: b

Explanation:

The Asian Games is a major sporting event held every four years, featuring athletes from various Asian countries. It is recognized by the International Olympic Committee and stands as the second-largest multi-sport event following the Olympics.

The inaugural Asian Games took place in New Delhi in 1951. Initially, the Asian Games were governed by the Asian Games Federation from 1951 to 1978. From 1982 onwards, the Olympic Council of Asia took over the regulation of the event.

The symbol of the Asian Games is a rising sun with interlocking rings.

India played a significant role in the history of the Asian Games, being a founding member and hosting the first edition in 1951. India also hosted the 1982 Asian Games in New Delhi.

79. Answer: b

Explanation:

Azerbaijani is the official language spoken in Azerbaijan. Azerbaijan is not a landlocked country; it is located on the Caspian Sea coast. Azerbaijan shares its borders with Armenia, Georgia, Russia, and Iran.



80. Answer: c

Explanation:

Female participation has been quite encouraging in the wave of human capital formation through Skill India Mission and Start-up and Stand-Up India. Under the PM Kaushal Vikas Yojana, over 59 lakh women have been certified, which constitutes more than 40 per cent of the total certified as of June 2022. Around 70 per cent of the loans have been sanctioned to women entrepreneurs under PM Mudra Yojana, and 80 per cent of the beneficiaries under Stand-Up India are women. Realising the vision of Digital India, more than 53 per cent of the beneficiaries of the Prime Minister's Rural Digital Literacy Campaign (PMGDISHA) are women as of July 2023.

81. Answer: d

Explanation:

According to the annual Periodic Labour Force Surveys (PLFS) by the National Statistical Organisation, MoSPI, the unemployment rate has declined substantially from 6 per cent in 2017-18 (when the first round of the survey was conducted) to 3.2 per cent in 2022-23, a trend observed across male and female workers in rural and urban areas.

This has been accompanied by a rising LFPR from 49.8 per cent in 2017-18 to 57.9 per cent in 2022-23, driven by a surge in rural female LFPR. The labour markets also recovered swiftly from the impact of the pandemic, with the rural areas witnessing a faster-paced resumption.

82. Answer: d

Explanation:

To complement PM GatiShakti National Master Plan (NMP), the National Logistics Policy (NLP) was launched on 17th September 2022 by the Prime Minister, Shri Narendra Modi. While the PM GatiShakti NMP addresses integrated development of the fixed infrastructure and network planning, the NLP addresses the soft infrastructure and logistics sector development aspect, inter alia, including process reforms, improvement in logistics services, digitization, human resource development and skilling.

The vision of NLP is to drive economic growth and business competitiveness of the country through an integrated, seamless, efficient, reliable, green, sustainable and cost-effective logistics network by leveraging best in class technology, processes and skilled manpower. This will reduce logistics cost and improve performance.

The targets of the NLP are to: (i) Reduce cost of logistics in India; (ii) improve the Logistics Performance Index ranking – endeavor is to be among top 25 countries by 2030, and (iii) create data driven decision support mechanism for an efficient logistics ecosystem.

To achieve these targets, a Comprehensive Logistics Action Plan (CLAP) as part of the NLP was launched covering eight action areas including (i) Integrated Digital Logistics Systems; (ii) Standardization of Physical Assets and Benchmarking of Service Quality Standards; (iii) Logistics Human Resource Development and Capacity Building; (iv) State engagement; (v) EXIM Logistics; (vi) Services Improvement Framework; (vii) Sectoral Plans for Efficient Logistics (SPEL); and (viii) Facilitation of Development of Logistics Parks.

83. Answer: a

Explanation:

The key ratios of Public Sector Banks (PSBs) for the years 2013-14 and 2022-23 are as follows:

2013-14:

- Net Interest Margin (NIM): 2.45%
- Return on Assets (RoA): 0.50%
- Return on Equity (RoE): 8.48%

2022-23:

- Net Interest Margin (NIM): 2.72%
- Return on Assets (RoA): 0.79%
- Return on Equity (RoE): 12.35%

84. Answer: a

Explanation:

Weak demand for both oil and meal, which is the residual de-oiled cake used as livestock feed ingredient, is contributing to the bearish market sentiment. One of the primary reasons for this trend is the record imports of edible oil, with projections indicating that India's vegetable oil imports reached an all-time high of 17 million tonnes in 2022-23.

85. Answer: c

Explanation:

The International Migration Outlook 2023 report by the Organisation for Economic Co-operation and Development (OECD) highlights several key trends in global migration patterns:

- Statement 1 is correct. India Emerges as the Leading Source of Migration: India surpassed China as the primary source of migration to OECD countries in 2021 and 2022. India consistently topped the list with 0.41 million new migrants in both years.
- Statement 3 is correct. Climate-Induced Displacement: The report emphasizes the growing focus on policy responses to climate-induced displacement. Few OECD countries have explicit policies to address this issue, but Colombia has taken steps to recognize and support climate-displaced individuals.
- Refugee Inflows and Worker Migration: The OECD region experienced record refugee inflows due to the Russia-Ukraine war, with over 10 million people becoming internally displaced or refugees. Worker migration also saw significant increases from countries like India, Uzbekistan, and Turkey.
- Recent Trends in International Migration: All top four destination countries (The United States, Germany, the United Kingdom, and Spain) registered large year-on-year increases in migration. The United States alone accounted for 1.05 million new permanent-type migrants in 2022.
- Statement 2 is correct. Permanent-Type Migration Categories: Family migration remained the primary category of entry for new permanent-type migrants in 2022, representing 40% of all permanent-type migration. The share of labour migration has increased over time, while the share of free movement migration has decreased since 2020.

86. Answer: d

Explanation:

- **Tigris:** The Tigris is one of the two great rivers that define Mesopotamia, the other being the Euphrates. It flows through Turkey, Iraq, and Iran before emptying into the Persian Gulf. The river has played a significant role in the history and development of ancient civilizations, including the Sumerians, Babylonians, and Assyrians.
- **Yukon:** The Yukon River is one of the longest rivers in North America, flowing through the Canadian territory of Yukon and the U.S. state of Alaska. It originates in British Columbia's Coast Mountains and empties into the Bering Sea. The river is known for its scenic beauty and its importance to indigenous peoples and wildlife.

- **Murray:** The Murray River is Australia's longest river, running through the southeastern part of the continent. It begins in the Australian Alps and flows westward to the Southern Ocean. The Murray River is a vital source of water for agriculture, industry, and urban areas in Australia, supporting diverse ecosystems along its course.
- **Niger:** The Niger River is the principal river of West Africa, flowing through several countries, including Guinea, Mali, Niger, Benin, and Nigeria, before emptying into the Gulf of Guinea. It is known for its unique "inland delta" in Mali, where the river fans out to create a vast wetland area. The Niger River basin supports agriculture, fishing, and transportation for millions of people.
- **Lena:** The Lena River is one of the major rivers of Siberia, flowing northward through the Russian regions of Yakutia and into the Laptev Sea in the Arctic Ocean. It is one of the longest rivers in the world and plays a crucial role in the region's ecosystem, supporting diverse wildlife and providing transportation and hydroelectric power.

87. Answer: B

Explanation:

- **Sunauli-Bhairawa:** This border crossing is incorrectly matched with its location. Sunauli is a town in the Indian state of Uttar Pradesh, and Bhairawa (also known as Bhairahawa) is a town in Nepal, making this crossing between India and Nepal.
- **Petrapole-Benapole:** This border crossing is incorrectly matched. Petrapole is a town in the Indian state of West Bengal, and Benapole is a town in Bangladesh. Therefore, the correct location for Petrapole-Benapole should be "c) India - Bangladesh".
- **Hili-Burimari:** This border crossing is correctly matched with its location as c) India - Bangladesh. Hili is a town in West Bengal, India, and Burimari is a location in Bangladesh.
- **Panitanki-Kakarbhitta:** This border crossing is correctly matched with its location as d) India - Nepal. Panitanki is in the Indian state of West Bengal, and Kakarbhitta is a town in Nepal.

Notable land border crossings pertaining to India:

1. India - Pakistan:

- Wagah-Attari Border Crossing: Located between Amritsar in the Indian state of Punjab and Lahore in the Punjab province of Pakistan, it is one of the few road border crossings between the two countries. It is famous for the daily Wagah border ceremony.

2. India - Nepal:

- Sunauli-Bhairawa Border Crossing: Connecting Sunauli in Nepal with Bhairahawa in the Indian state of Uttar Pradesh, this is one of the busiest and most important border crossings between India and Nepal.
- Panitanki-Kakarbhitta Border Crossing: Located in the eastern part of Nepal, it connects Panitanki in the Indian state of West Bengal with Kakarbhitta in Nepal's eastern region.

3. India - Bangladesh:

- Petrapole-Benapole Border Crossing: Connecting Petrapole in West Bengal, India with Benapole in Jessore District, Bangladesh, it is one of the major land border crossings between the two countries.
- Hili-Burimari Border Crossing: Located in the state of West Bengal, India, and in the Rangpur Division of Bangladesh, this crossing facilitates trade and travel between the two nations.

4. India - China:

- Nathu La Pass: Situated in the Himalayas, Nathu La Pass in Sikkim is one of the few open border crossings between India and China, primarily used for trade and pilgrimage purposes.

5. India - Myanmar (Burma):

- Moreh-Tamu Border Crossing: Located in the Indian state of Manipur and the Sagaing Region of Myanmar, this crossing is significant for trade and cultural exchanges between the two countries.

88. Answer: A

Explanation:

1. Paracel Islands: 112°20'E
2. Spratly Islands: 115.8265° E
3. Scarborough Shoal: 117.7727° E
4. Natuna Islands: 108.2500° E
5. Palawan Island: 118.3929° E

89. Answer: B

Explanation:

Out of the provided options, the most likely impacts of increased taxes on high-income earners in Country X are Reduced investment in small-scale enterprises and Decline in savings and investment in financial markets. Therefore, the correct answer is B) Only two.

Here's why:

- **Reduced investment in small-scale enterprises:** High-income individuals often invest in various ventures, including small businesses. Increased taxes can lead to a decrease in their disposable income, potentially reducing the amount of capital available for investment in small-scale enterprises, which can hinder their growth and contribute to economic slowdown.
- **Decline in savings and investment in financial markets:** With a decrease in disposable income, high-income individuals might be less inclined to save or invest in financial markets like stocks and bonds. This can lead to reduced liquidity and potentially hamper the overall growth of the financial system.

While the other options are less likely or have weaker supporting evidence:

- **Decreased government spending on social welfare programs:** While the government might use some of the increased tax revenue from high-income earners for social welfare programs, the government might also choose to invest the revenue in other sectors like infrastructure or education.
- **Deterioration of consumer confidence:** The impact on consumer confidence can be mixed. While high-income individuals might spend less due to decreased disposable income, the increased spending by low-income earners might offset this decline and even boost overall consumer confidence.
- Therefore, reduced investment in small-scale enterprises and a decline in savings and investment in financial markets are the most likely consequences of increased taxes on high-income earners in the given scenario. However, it's important to remember that these are just potential outcomes, and the actual impact of the policy might vary depending on several factors the specific design of the policy, the existing economic conditions, and the behaviour of different income groups.

90. Answer: A

Explanation:

Statement 1 is Correct: This is the most likely and effective tool to address a depreciating currency. By raising interest rates, the RBI makes it more expensive to borrow in rupees, which discourages borrowing and spending. This reduces the overall demand for the currency, pushing its value up. This is a common strategy used by central banks worldwide in such situations. Higher interest rates can attract foreign investment, which can strengthen the currency.

Statement 2 is Incorrect: Selling foreign exchange reserves to buy rupees might seem like a direct way to boost the currency's value. However, it can have negative consequences. For example, it depletes the RBI's reserves, which are crucial for maintaining financial stability and intervening in the market during future crises.

Statement 3 is Incorrect: Trade barriers, like tariffs or quotas, might seem helpful by restricting imports and encouraging exports. However, they are generally considered ineffective and harmful in the long run. They can lead to higher prices for consumers, distort market efficiency, and invite retaliation from trading partners, potentially worsening the economic situation.

Statement 4 is incorrect: The RBI can intervene in the foreign exchange market by directly buying rupees with its foreign exchange reserves. This can provide immediate support to the currency and signal confidence in the market. However, it's a temporary measure and can be expensive, especially if the depreciation pressure is significant. Continued intervention might require depleting reserves and ultimately be unsustainable.

91. Answer: D

Explanation:

All options are correct: Clouds are visible masses of tiny water droplets or ice crystals suspended in the Earth's atmosphere. They are an essential part of the water cycle and play a crucial role in shaping weather patterns and climate. Clouds are formed through the process of condensation, where water vapour in the air transforms into liquid water or ice crystals.

Formation of Clouds:

Evaporation: The water cycle begins when water evaporates from bodies of water, such as oceans, lakes, and rivers, or moist surfaces on land. The heat from the Sun causes water to change from a liquid to a gaseous state, forming water vapour.

- **Rising Air:** As the Sun heats the Earth's surface, the air near the ground becomes warmer and less dense. This warm air rises due to buoyancy. As the air rises, it cools down due to the expansion of the atmosphere at higher altitudes. The cooling causes the water vapour to condense back into tiny water droplets or ice crystals.
- **Condensation Nuclei:** For water vapour to condense, it requires tiny particles called condensation nuclei around which the water droplets can form. These nuclei can be dust, salt particles, or even pollution particles in the air.
- **Saturation:** As the air rises and cools, it eventually reaches a point where it becomes saturated with water vapour. The temperature at which saturation occurs is called the dew point. Once the air reaches its dew point, the excess water vapour condenses around the condensation nuclei to form visible droplets or ice crystals, creating clouds.

Types of Clouds:

- **Cirrus Clouds:** **High-altitude clouds that appear thin, wispy, and feathery.** They are composed of ice crystals and are often a sign of fair weather.
- **Cumulus Clouds:** **Fluffy, puffy clouds with a well-defined shape, often resembling cotton balls.** They typically form at low to middle altitudes and are associated with fair weather.
- **Stratus Clouds:** **Low-altitude clouds that appear as a uniform, grey layer covering the sky.** They often bring overcast skies and may lead to light precipitation.
- **Nimbostratus Clouds:** Low-altitude, dark, and thick clouds associated with continuous precipitation, like rain or snow.
- **Cumulonimbus Clouds:** Tall, towering clouds that extend vertically through multiple layers of the atmosphere. **They bring heavy rain, thunderstorms, and sometimes severe weather.**

92. Answer: D

Explanation:

All statements are correct: Age-sex pyramids are essential tools for understanding population trends, making policy decisions related to healthcare, education, retirement, and social welfare, and planning for the future needs of a population. By analyzing population pyramids over time, demographers can project future population trends and help governments and organizations prepare for the challenges and opportunities presented by changing demographics.

Pyramid Base (Younger Population):

- **The wider base of the pyramid represents the younger age groups,** including children and adolescents.
- In developing countries with higher birth rates and lower life expectancy, the base is broader, indicating a larger young population.

Pyramid Top (Older Population):

- **The narrower top of the pyramid represents the older age groups,** including elderly individuals.
- In developed countries with lower birth rates and higher life expectancy, the top is narrower, indicating a larger elderly population.
- The shape of the age-sex pyramid can be classified into different patterns, each reflecting a different demographic scenario:

Expansive Pyramid:

- This pyramid has a wide base and narrows gradually towards the top.
- **It indicates a population with high birth rates, high death rates, and a large proportion of young people.** This pattern is typical of developing countries with rapid population growth.

Constrictive Pyramid:

- This pyramid has a narrow base and gradually widens towards the top.
- It indicates a population with low birth rates, low death rates, and a larger proportion of older people. This pattern is typical of developed countries with slower population growth and an ageing population.

Stationary Pyramid:

- This pyramid has a relatively uniform width across all age groups.
- **It indicates a population with relatively stable birth and death rates and balanced age distribution.**

93. Answer: C

Explanation:

Statement 1 is incorrect: Masai Giraffes, also known as Maasai Giraffes, are one of the nine recognized subspecies of giraffes (*Giraffa camelopardalis*). **They are native to East Africa and are primarily found in Kenya and Tanzania.** These majestic animals are the tallest land mammals on Earth, known for their distinctively long necks and legs, as well as their unique spotted coat patterns.

Statements 2, 3 and 4 are correct: key facts about Masai Giraffes

- Appearance: Masai Giraffes have a coat with large, irregularly shaped patches that are orange-brown in colour, separated by white spaces. The coat pattern is similar to that of a leopard, but the patches are more jagged and not as closely spaced. Their legs and necks are extremely long, enabling them to reach vegetation high above the ground.
- Size: Adult Masai Giraffes can reach an impressive height of up to 5.5 to 6 meters (18 to 20 feet) and weigh between 800 to 1,200 kilograms (1,800 to 2,600 pounds).
- Diet: Giraffes are herbivores and primarily feed on leaves, buds, flowers, and fruits from tall trees and shrubs. Their long necks allow them to access food sources that other animals cannot reach.
- Behaviour: Masai Giraffes are generally social animals and are often found in loose, mixed-sex herds. These herds can vary in size and composition, and individuals within the herd can change over time. Males establish dominance through necking, a behaviour where they swing their necks at each other in a show of strength.
- Habitat: They inhabit savannas, woodlands, and open grasslands. Giraffes prefer areas with acacia and combretum trees, as these are their primary food sources.
- Conservation Status: Like many other giraffe subspecies, Masai Giraffes face threats in the wild. These threats include habitat loss due to human encroachment, poaching for their body parts, and competition with livestock for resources. Masai Giraffes are listed as "endangered" by the International Union for Conservation of Nature (IUCN).
- Masai Giraffes are not only iconic symbols of the African savannas but also important contributors to the ecosystem by helping disperse seeds and shaping the vegetation through their feeding habits. Preserving their populations and habitats is crucial for maintaining the biodiversity and ecological balance of their native regions.

94. Answer: B

Explanation:

Padmaja Naidu Himalayan Zoological Park:

- The Padmaja Naidu Himalayan Zoological Park (PNHZP) is located in Darjeeling, West Bengal also known as Darjeeling Zoo.
- It was named after Padmaja Naidu, the daughter of Sarojini Naidu and a former governor of West Bengal.
- It was established on 14th August 1958 in Darjeeling (West Bengal) as a joint venture of Govt. of India (Department of Science and Technology) and Govt. of West Bengal (Department of Education).
- It is India's largest high-altitude zoo, with an average elevation of 7,000 feet.
- It started work on a captive breeding project of this rare species in 1983.
- The first ex-situ conservation breeding program started in 1986 as a Snow Leopard conservation breeding project.
- The Red Panda project was started in 1990.
- The zoo was awarded the "Royal Bank of Scotland Earth Hero Award" as recognition for its efforts towards in-situ and ex-situ conservation, in 2014

95. Answer: B

Explanation:

The term "Cobra Effect" derives from a historical example in which the British government in India offered a bounty for dead cobras to reduce the cobra population. However, people began breeding cobras to claim the reward, leading to an increase in the cobra population. This scenario exemplifies how well-meaning policies can backfire and worsen the issue they were intended to address.

96. Answer: D

Explanation:

Changi Naval Base of Singapore serves as an Indian Naval base in Singapore.

India has developed a military base on North Agalega Island deploying a coastal surveillance radar system.

Farkhor Air Base is located near the town of Farkhor in Tajikistan. It is 130 km southeast of the capital Dushanbe.

In 2018, India bought a Sri Lankan Airbase in Hambantota to keep an eye on the Chinese Navy.

97. Answer: B

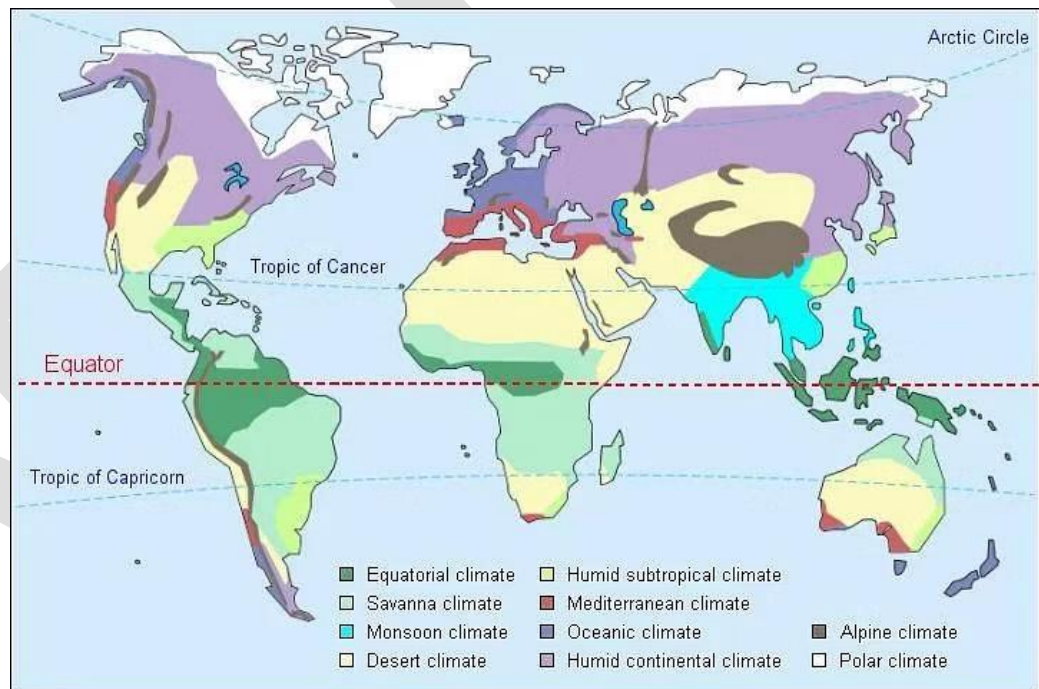
Explanation:

Statement 1 is correct: The British type of climate has adequate rainfall throughout the year with a tendency towards a slight winter maximum (due to frontal cyclones). Western margins have the heaviest rainfall due to westerlies. Relief can make great differences in the annual amount.

Statement 2 is incorrect:
The climate of India is a monsoon type of climate because of its weather conditions which change from season to season. The Gulf type of Climate is found in the eastern margin of Northern America (Florida, Texas, etc, in the USA).

Statement 3 is incorrect:
The Mediterranean climate is considered good for grapes. Only 2% of the earth's surface is covered by a Mediterranean climate. The long growing season is marked by sunny, warm, and dry days followed by cool evenings, an ideal combination for allowing grapes to ripen slowly and evenly.

World Climatic Types				
Climatic Zone	Latitude (Approximate)	Climatic Type	Rainfall Regime (with approx. total)	Natural Vegetation
Equatorial Zone	0°-10°N and S	1. Hot, wet equatorial	Rainfall all year round : 80 inches	Equatorial rain forests
Hot Zone	10°-30°N and S	2. a) Tropical Monsoon	Heavy summer rain: 80 inches	Monsoon forests
		b) Tropical Marine	Much summer rain: 70 inches	
		3. Sudan Type	Rain mainly in summer: 30 inches	Savanna (tropical grassland) Desert vegetation and scrub
		4. Desert: a) Saharan type b) Mid-latitude type	Little rain: 5 inches	
Warm Temperate Zone	30°-40°N & S	5. Western Margin (Mediterranean type)	Winter rain: 35 inches	Mediterranean forests and shrub
		6. Central Continental (Steppe type)	Light summer rain: 20 inches	
		7. Eastern Margin: a) China type b) Gulf type c) Natal type	Heavier summer rain : 20 inches	Steppe or temperate grassland Wawrm, wet forests and bamboo
		8. Western Margin (British type)	More rain in autumn & winter : 30 inches	
Cool Temperate Zone	45°-65°N & S	9. Central Continental (Siberian type)	Light summer rain: 25 inches	Deciduous forests
		10. Eastern Margin (Laurentian type)	Moderate summer rain : 40 inches	
		11. Arctic or Polar	Very light summer rain : 10 inches	Evergreen coniferous forests Mixed forests (coniferous and deciduous)
		12. Mountain climate	Heavy rainfall (variable)	
Cold Zone	65°-90° N & S			Tundra, mosses, lichens
Alpine Zone				Alpine pastures, conifers, fern, snow



98. Answer: B

Explanation:

Option 1 and 2 are correct: Monotremes or Prototherians are egg laying (oviparous) mammals. Currently, there are only three species of Monotremes which are extant viz. Duckbilled Platypus and two species of Echidnas. These are found only in Australia and New Guinea.

The major marsupials found in South America are flipper-wearing yapok and bare-tailed woolly opossum.

Dugongs are herbivorous marine mammals which belong to manatee species. Dugongs are listed as Vulnerable on the IUCN Red List of Threatened Species. Hence Option 3 and 4 are not correct.

Egg-laying mammals

Some mammals lay eggs instead of giving birth to live young. These are the monotremes, found only in Australia and the island of New Guinea. They include the duck-billed platypus and four species of spiny-coated echidnas.

Sir David's long-beaked echidna
This species lives in a tiny area of a mountain range in Indonesia. Only one specimen has ever been found in the wild.

Western long-beaked echidna
Long-beaked echidnas from hotter lowlands look spicier because they have less insulating fur than those that live in cooler highlands.

Eastern long-beaked echidna
These thick-furred, long-beaked echidnas from central and eastern Papua New Guinea live in mountain forests and alpine grasslands.

Platypus
The platypus needs wetter habitats than those of short-beaked echidnas, so it is confined to the eastern forests where there is open water to swim and feed.

Highly adaptable
Monotremes inhabit a wide variety of habitats, from Australia's arid deserts to the snow-covered mountains of Papua New Guinea. Short-beaked echidnas are the most adaptable and have the largest range, while the other monotremes are limited to smaller areas.

Spiny coat
An echidna's coat is made up of protective spines interspersed with fur. If threatened, the echidna can roll into a spiky ball.

Eastern long-beaked echidna

Spiny coat
An echidna's coat is made up of protective spines interspersed with fur. If threatened, the echidna can roll into a spiky ball.

Toothless feeding
All monotremes lack teeth, and instead have sensitive beaks for catching invertebrate prey. Echidnas dig through soil with sharp claws to expose prey and use their long, sticky tongue to trap them. The platypus uses its sensitive bill to find shellfish buried in the mud, then crushes them with horny plates inside its bill.

Forest dwellers
In the forests of western Australia, short-beaked echidnas make their homes among rocks, in the spaces between tree roots, and inside hollow logs.

Leathery eggs
All monotreme eggs are small and leathery. The platypus lays two grape-sized eggs at a time, while echidnas produce just one. Upon hatching, the babies are then fed with milk, just like all other mammals.

Animals in danger
The IUCN lists Sir David's long-beaked echidna and the western long-beaked echidna as critically endangered, while the eastern long-beaked echidna is vulnerable and the platypus is near threatened. All of their populations are declining.

Beaver-like tail
All monotremes can swim, but the platypus is especially well adapted - with a flat tail for manoeuvring and webbed feet for paddling.

Coping with cold
In Tasmania - one of the coldest parts of Australia - the platypus stays active even in winter, but the short-beaked echidna spends the winter in hibernation.

KEY
Short-beaked echidna
Western long-beaked echidna
Eastern long-beaked echidna
Platypus
Note: the range of Sir David's long-beaked echidna is not visible at this scale.

MALE PLATYPUSES HAVE VENOMOUS SPURS ON THEIR HIND LIMBS

99. Answer: B

Explanation:

Trade relations between India and France have seen steady growth, with bilateral trade reaching US\$ 13.4 billion in 2022-23, marking a 7.72% increase from the previous year. France is the 11th largest investor in India, with an FDI inflow of US\$ 10.5 billion. From January-December 2021, bilateral trade in goods (excluding military equipment) stood at US\$ 12.14 billion, showing a 39.17% increase compared to the previous year. India exported 4,715 commodities to France in FY23, with exports totalling US\$ 7.61 billion, including petroleum products, electrical machinery, drug formulations, and cotton. India imported 4,253 commodities from France in FY23, with imports totalling US\$ 5.77 billion, including aircraft, electrical machinery, petroleum products, and electronics components.

100. Answer: D

Explanation:

Products of the Maillard Reaction:

- Melanoidins: High molecular weight brown polymers responsible for the characteristic color of roasted and baked foods.
- Aromatic Compounds: A diverse range of volatile compounds, including pyrazines, thiols, and furans, contribute to the flavor and aroma of cooked foods.
- Heterocyclic Compounds: Compounds such as furfurals and pyrroles contribute to the complex flavor profile of foods undergoing the Maillard reaction.
- Acrylamide: Under certain conditions, the Maillard reaction can lead to the formation of acrylamide, a potentially carcinogenic compound found in fried and baked foods.

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