

UPSC OPEN MOCK TEST 1 GS (SOLUTION)

Q 1. Ans: (c)

Explanation:

- **Statement I is Correct:** Indian meteorologists have observed a rising trend in “mini-cloudbursts” i.e. intense rainfall events that are localised but do not quite meet the extreme threshold of a classical cloudburst. These events are becoming more frequent due to climate change and rising surface temperatures, which increase the moisture-holding capacity of the atmosphere. While they are less intense than a full cloudburst, their frequency and unpredictability pose a significant threat to urban infrastructure and hilly terrains.
- **Statement II is Incorrect:** The India Meteorological Department (IMD) does not have an “official” definition for a mini-cloudburst; it only officially defines a cloudburst as rainfall of 10 cm or more in one hour over an area of roughly 20–30 square kilometers. The term “mini-cloudburst” is a descriptive term used by scientists and the media for rainfall events that are very intense (e.g., 5 cm to 9 cm in an hour) but fall just short of the 10 cm official benchmark.
- **Statement III is Correct:** The interaction between Western Disturbances and the Southwest Monsoon is a well-documented driver of extreme weather in Northern India, often triggering these intense, localized rainfall events. When the cold, dry air from a Western Disturbance meets the warm, moisture-laden winds of the monsoon, it creates massive atmospheric instability and rapid cloud formation.

Q 2. Ans: (b)

Explanation:

- **Statement I is Correct:** The **Richter scale**, developed by Charles Richter in 1935, is designed to measure the **magnitude** of an earthquake by calculating the logarithm of the amplitude of the largest seismic wave recorded by a seismograph. It specifically focuses on the physical energy released at the source rather than the damage caused on the surface. This measurement allows scientists to compare the relative size of earthquakes regardless of where the recording station is located.
- **Statement II is Correct:** Theoretically, the Richter

scale is **logarithmic** and has **no fixed upper limit**, meaning it can technically measure any amount of energy released. In practical terms, however, the Earth’s crust has a physical limit to how much stress it can accumulate before breaking, which usually caps observed earthquakes around magnitude 9.5.

- **Statement III is Incorrect:** Each increase of one unit on the Richter scale actually represents a **10-fold increase** in the measured amplitude (wave magnitude), not a 100-fold increase. When discussing the total **energy released**, a one-unit increase corresponds to approximately **32 times** more energy.

Q 3. Ans: (a)

Explanation:

- **Pair I is Correct:** The **Adriatic Sea** is a body of water separating the Italian Peninsula from the Balkan Peninsula. **Albania** is located on the southeastern coast of this sea, specifically bordering the Strait of Otranto, which connects the Adriatic to the Ionian Sea. Other countries bordering the Adriatic include Italy, Slovenia, Croatia, Bosnia and Herzegovina, and Montenegro.
- **Pair II is Correct:** The **Ligurian Sea** is an arm of the Mediterranean Sea located between the Italian Riviera (Liguria) and the island of Corsica. It borders the northwestern coast of **Italy**, specifically the regions of Liguria and Tuscany, as well as parts of France and Monaco. It is a vital waterway for major Italian ports like Genoa and La Spezia.
- **Pair III is Incorrect:** The **Aegean Sea** is located between the Greek peninsula to the west and Anatolia (Turkey) to the east. **Portugal**, however, is located on the western side of the Iberian Peninsula and borders the **Atlantic Ocean**, not the Mediterranean or Aegean. This pair is incorrect because Portugal is thousands of kilometres away from the Aegean basin.
- **Pair IV is Incorrect:** The **Ionian Sea** is an elongated bay of the Mediterranean Sea, south of the Adriatic, bordered by southern Italy, Sicily, and Greece. **Spain** borders the **Alboran Sea** and the **Balearic Sea** in the western Mediterranean, as well as the Atlantic Ocean. Spain has no coastline along the Ionian Sea, which is situated much further east.



Q 4. Ans: (b)

Explanation:

- **Statement I is Correct:** The Huanpu River is the largest river in Shanghai, serving as a critical artery for the city's economy and tourism. It divides the city into two main areas: **Puxi** (the historic center) and **Pudong** (the modern financial district). As a tributary of the Yangtze River, it is famous for the Bund, where the colonial-era skyline faces the futuristic skyscrapers across the water.
- **Statement II is Incorrect:** **Bangkok**, the capital of Thailand, is actually located on the delta of the **Chao Phraya River**, not the Red River. The Chao Phraya is the most important waterway in Thailand, flowing through the heart of the city before emptying into the Gulf of Thailand. The **Red River** is located much further north and east, primarily flowing through northern Vietnam and Southern China.
- **Statement III is Incorrect:** **Hanoi**, the capital of Vietnam, is situated on the banks of the **Red River** (Song Hong), not the Chao Phraya. The city's geography is deeply defined by its position in the Red River Delta, which is a major agricultural and economic hub for the country. The Chao Phraya River, as mentioned previously, is located entirely within the borders of Thailand, thousands of kilometers away from Hanoi.
- **Statement IV is Correct:** **Yangon** (formerly Rangoon), the largest city in Myanmar, is situated at the convergence of the **Yangon and Bago Rivers**. The Bago River flows through the Bago Region and joins the Yangon River (which is an estuarial branch of the

Ayeyarwady) just south of the city center. This river system provides essential maritime access for the Port of Yangon, which handles the majority of the country's international trade.

Q 5. Ans: (d)

Explanation:

- **Row I is Incorrect:** Takeshima (Japanese) or Dokdo (Korean) are disputed islets in the Sea of Japan (North Pacific), currently under South Korean and not the North Korea administration. While Japan considers them an inherent, illegally occupied territory, South Korea maintains control with a police detachment. The location holds strategic value for fisheries and potential natural gas hydrates
- **Row II is Incorrect:** Socotra is an island located in the Arabian Sea, which is part of the Indian Ocean. However, it belongs to Yemen, not Ethiopia or Somalia. The island lies near the Horn of Africa but is politically part of Yemen.
- **Row III is Incorrect:** Bondi Beach is a world-famous coastal landmark located in Sydney, Australia, and it borders the Tasman Sea (part of the South Pacific), not the Atlantic Ocean. It is an Australian national heritage site and has no association with Suriname, a country located on the northeastern coast of South America. There is no international dispute over this beach; it is entirely within Australian jurisdiction.



Q 6. Ans: (a)

Explanation:

- **Pyrolusite** and **Psilomelane** are the two most important oxide ores of manganese. Pyrolusite is the most common and contains the highest percentage of manganese, while Psilomelane is a hydrous manganese oxide often found in sedimentary deposits.

Mineral	Primary Ores	Major Mines / Locations in India
Manganese	Pyrolusite, Psilomelane, Manganite	Balaghat (Madhya Pradesh), Nagpur & Bhandara (Maharashtra), and Keonjhar (Odisha).
Nickel	Pentandite, Limonite, Garnierite	Sukinda Valley (Odisha) is the primary source; it is often found as a byproduct of chromite mining.
Zinc	Sphalerite (Zinc Blende), Calamine	Zawar Mines (Udaipur, Rajasthan) is the largest and oldest zinc mining heritage site in India.
Tin	Cassiterite	Dantewada (Chhattisgarh) is currently the only state in India that produces tin commercially.

Q 7. Ans: (b)

Explanation:

- **Pair I is Incorrect:** A Special Leave Petition is filed exclusively before the Supreme Court of India, not the High Courts. Under Article 136 of the Constitution, the Supreme Court has the discretionary power to grant special leave to appeal against any judgment, decree, or order passed by any court or tribunal in the country. It is a residual power used when a substantial question of law is involved or when gross injustice has occurred.
- **Pair II is Correct:** A Mercy Petition is a formal request for clemency submitted to the President of India (under Article 72) or the Governor of a State (under Article 161). It is usually the last resort for a convict,

often those facing the death penalty, seeking a pardon, commutation, or reprieve. The power of mercy is an executive power exercised on the advice of the Council of Ministers to provide a final check against judicial error or for humanitarian reasons.

- **Pair III is Incorrect:** A Curative Petition is not filed under Article 136; it is a concept evolved by the Supreme Court in the *Rupa Ashok Hurra vs. Ashok Hurra* (2002) case under Articles 129 and 142. It is the very last judicial resort available after a review petition has been dismissed, intended to prevent abuse of process or a “miscarriage of justice”.

Q 8. Ans: (c)

Explanation:

Article 236 of the Constitution of India defines the District Judge. A **District Judge** is the principal judicial authority at the district level in India and holds the highest position in the district judiciary. Under Article 236 of the **Constitution of India**, the expression “district judge” is used in a broad sense and includes **Judge of a City Civil Court, Additional District Judge, Joint District Judge, Assistant District Judge, Chief Judge of a Small Causes Court, Chief Presidency Magistrate, Additional Chief Presidency Magistrate, Sessions Judge, Additional Sessions Judge, and Assistant Sessions Judge**. This wide inclusion reflects the senior status and comprehensive judicial role of district-level judges in both civil and criminal matters.

Q 9. Ans: (d)

Explanation:

- **Statement I is Correct:** The Supreme Court of India has used Article 142 to allow students to take admission even after the prescribed deadline in exceptional situations. This power is exercised to prevent loss of an academic year due to administrative lapses or errors beyond the student’s control. In *Asha v. Pt. B.D. Sharma University of Health Sciences* (2012), the Court permitted admission beyond the cutoff date to ensure fairness.
- **Statement II is Correct:** In the landmark A.G. Perarivalan case (2022), the Supreme Court used Article 142 to order the release of a convict, effectively exercising a power similar to a pardon when the executive failed to act on the Governor’s advice
- **Statement III is Correct:** The Supreme Court has invoked Article 142 to allow termination of pregnancy beyond statutory limits in exceptional cases. This is done to protect the life, health, dignity, and bodily autonomy of women when strict application of the law would cause injustice. In *X v. Union of India* (2023), the Court permitted abortion considering the woman’s mental and physical health.
- **Statement IV is Correct:** The Supreme Court has

directed payment of compensation or financial assistance to victims in disaster and mass harm cases using Article 142. Such orders are passed when statutory relief mechanisms are inadequate or delayed. In *M.C. Mehta v. Union of India (Oleum Gas Leak Case, 1987)*, the Court awarded compensation to victims to ensure immediate justice.

Q 10. Ans: (b)

Explanation:

- **Statement I is Correct:** Under Article 78(a), the Prime Minister serves as the primary channel of communication between the Cabinet and the President. It is their constitutional obligation to keep the President informed of all decisions made by the Council of Ministers regarding the administration of the Union's affairs. This ensures that the Head of State is aware of the executive actions being taken by the government.
- **Statement II is Correct:** According to Article 78(b), the Prime Minister is required to furnish any information relating to the administration of the affairs of the Union and proposals for legislation as the President may call for. This means the President has the right to be briefed on upcoming bills or legal frameworks before they are introduced in Parliament. It maintains a system of checks and balances within the executive branch.
- **Statement III is Incorrect:** The Comptroller and Auditor General (CAG) is an independent constitutional authority. According to Article 151, the CAG submits his audit reports relating to the Union accounts directly to the President. The Prime Minister does not "submit decisions" of the CAG; in fact, the CAG's independence is protected precisely so that his reports are not filtered by the government (PM) before reaching the President.

Q 11. Ans: (a)

Explanation:

- **Statement I is Correct:** Parliament can increase or diminish the area of any State, which has occurred during boundary adjustments, such as the **transfer of certain areas between Bihar and Jharkhand** after state reorganisation. These changes are carried out to improve governance and administrative efficiency. The authority rests solely with Parliament. Therefore, the statement is valid.
- **Statement II is Incorrect:** Article 4 specifically declares that any law made for the reorganisation of states (under Articles 2 and 3) shall **not be deemed to be an amendment** of the Constitution for the purposes of Article 368. Therefore, a simple majority in both houses is sufficient to change a state's name or boundaries, and a special majority is not required.

Q 12. Ans: (c)

Explanation:

- **Option (a) is Incorrect:** The United Nations Environment Programme and Intergovernmental Panel on Climate Change primarily focus on global environmental governance and climate science assessments. UNEP works on environmental policy coordination, while the IPCC assesses scientific knowledge on climate change. Neither organisation developed a standardised corporate accounting framework like the GHG Protocol.
- **Option (b) is Incorrect:** The Organisation for Economic Co-operation and Development and the International Energy Agency mainly deal with economic policy coordination and energy systems analysis. Although they publish emissions-related data and guidelines, they were not responsible for creating the GHG Protocol. Their work is advisory and analytical rather than framework development for emissions accounting.
- **Option (c) is Correct:** The Greenhouse Gas Protocol was jointly developed by the World Resources Institute and the World Business Council for Sustainable Development. WRI contributed scientific and methodological expertise, while WBCSD ensured business applicability and global adoption. Together, they created a standardised and widely accepted system for measuring and reporting greenhouse gas emissions.
- **Option (d) is Incorrect:** The World Bank and the International Monetary Fund focus on development finance, economic stability, and macroeconomic policy. While they support climate finance and emissions reduction initiatives, they did not design the GHG accounting framework. Their role is financial and policy-oriented rather than technical standard-setting.

Q 13. Ans: (a)

Explanation:

- **Statement I is Incorrect:** The Declaration of Rights for Native Stingless Bees was not adopted by the UNEP; it was a historic local move by the municipality of **Sayula de Alemán in Mexico** in early 2024. This represents a "Rights of Nature" legal framework where a local government recognises insects as legal entities. It is the first of its kind at a municipal level, aimed at protecting biodiversity from the ground up rather than through a global UN mandate.
- **Statement II is Correct:** The Declaration explicitly recognises native stingless bees as "subjects of rights," rather than merely ecological resources. It emphasises protection from threats such as excessive pesticide use, habitat destruction, and unsustainable agricultural practices. This rights-based approach aligns with emerging environmental ethics and biodiversity conservation principles.

- **Statement III is Incorrect:** International declarations, unless they are ratified treaties and even then, almost never supersede national laws of sovereign member states. In the hierarchy of laws, national constitutional and statutory laws remain supreme. Such declarations serve as “Guiding Principles” or “Soft Law” rather than mandatory legislation that overrides a country’s own laws.

Q 14. answer: (d)

Explanation:

All the listed items are recognised sources of lead pollution. Paints and solder historically contain high levels of lead and contribute to long-term environmental contamination. Stained glass and ceramic glazes use lead compounds that can leach into the environment if poorly manufactured. Ammunition introduces lead directly into soil and water bodies, while jewellery, especially low-quality or unregulated products, can contain lead that poses serious health risks.

Q 15. Answer: (b)

Explanation:

- **Pair I is Correct:** Gharials are characterised by a long, narrow, and strongly attenuated snout with rows of uniform, sharp interlocking teeth. This specialised snout structure helps them catch fish efficiently, which forms the bulk of their diet. It clearly distinguishes gharials from other crocodylians. Hence, the description in Column II is accurately matched.
- **Pair II is Correct:** The Indian Pangolin is often called a “scaly anteater” because it is covered in large overlapping keratin scales for protection. It lacks teeth and instead uses a powerful, long, and sticky tongue—which can be longer than its own body—to extract ants and termites from deep within their mounds. It is currently one of the most trafficked mammals in the world for its scales and meat.
- **Pair III is Incorrect:** While the Red Panda is indeed an exotic and charismatic species, its distribution in India is restricted to the **Eastern Himalayas**, specifically in states like Sikkim, Arunachal Pradesh, and the northern parts of West Bengal. The Western Himalayas (J&K, Ladakh, Himachal) are too dry and lack the specific bamboo-rich temperate forests that the Red Panda requires for survival.

Q 16. Ans: (b)

Explanation:

- **Statement 1 is Correct:** The Wildlife (Protection) Amendment Act, 2022, empowers the Central Government to regulate or prohibit the import, trade, possession, and proliferation of Invasive Alien Species. These are species not native to India whose

introduction may harm wildlife or its habitat. The Act also allows authorised officers to seize and dispose of such species. This provision strengthens India’s biosecurity framework.

- **Statement 2 is Correct:** The Chief Wildlife Warden, appointed by the State Government, is entrusted with the control, management, and maintenance of wildlife sanctuaries in a State. The Amendment Act clarifies that the Chief Wildlife Warden must act according to approved management plans. These plans are prepared as per the Central Government guidelines.
- **Statement 3 is Incorrect:** The 2022 Amendment actually **reduced** the number of schedules from six to **four**. The goal was to simplify the law; Schedule I now contains species with the highest protection, Schedule II contains species with lesser protection, Schedule III is for protected plants, and **Schedule IV** is a newly added schedule for species listed under **CITES** (Convention on International Trade in Endangered Species)
- **Statement 4 is Incorrect:** The 2022 Amendment expanded this power to include the **Central Government** as well. Previously, only State Governments could declare an area adjacent to a National Park or Sanctuary as a **Conservation Reserve**. Now, the Central Government can also declare such reserves in areas where it has ownership or interest, particularly for the protection of flora and fauna in specific landscapes.

Q 17. Ans: (a)

Explanation:

- Located in the Bastar district of **Chhattisgarh**, this park is renowned for its unique subterranean geomorphology, specifically the **Kutumsar and Kailash caves** which feature stunning stalactites and stalagmites. The park is also home to the breathtaking **Tirathgarh Waterfalls**, where the Mungabhar River cascades down in multiple steps. Its dense tropical moist deciduous forests provide a rich habitat for the **Bastar Hill Myna** (the state bird). Recently, its unique blend of geological wonders and cultural significance led to its inclusion in **UNESCO’s Tentative List of World Heritage Sites**, highlighting its global importance.

Q 18. Answer: (b)

Explanation:

- **Row I is Correct:** *Svapnavasavadattam* was authored by **Bhasa**. The play combines political strategy with romance and revolves around King Udayana and Queen Vasavadatta. The theme of diplomacy, disguise, and statecraft justifies its description as a political Sanskrit drama.
- **Row II is Correct:** *Malavikagnimitram* was written by **Kalidasa**. It depicts courtly love during the reign

of King Agnimitra of the Shunga dynasty and reflects palace intrigue and reconciliation. The theme and authorship are correctly stated. Therefore, this row is correct.

- **Row III is Incorrect:** *Ratnavali* was **not** authored by Banabhata. **Harsha**, the 7th-century ruler of Kannauj, wrote the play. It is a royal romance set in a political backdrop and centres on King Udayana and Princess Ratnavali. Banabhata was Harsha's court poet and authored *Harshacharita*, not *Ratnavali*.
- **Row IV is Incorrect:** *Vikramankadevacharita* does not relate to the Gupta dynasty. It was composed by **Bilhana** to glorify Vikramaditya VI of the Western Chalukya dynasty of Kalyani. The work is a court epic in the *charita* tradition, blending history with poetic exaggeration. Hence, the dynastic association given in the row is wrong.

Q 19. Ans: (c)

Explanation:

- **Row I is Correct:** Sisupalgarh is an important early historic fortified city near Bhubaneswar. It is well known for its advanced urban planning, including a sophisticated rainwater harvesting and drainage system. The site reflects the planned streets and water management practices of ancient India.
- **Row II is Incorrect:** Piprahwa, located in the Siddharthnagar district of **Uttar Pradesh**, is world-famous for its ancient stupa, which contains **Buddha's relics**, not Mahavir Jain relics. Archaeological excavations here unearthed soapstone caskets with inscriptions indicating they held the remains of the Shakya Sage (Gautama Buddha). It is a vital pilgrimage site for Buddhists, identifying the location as the ancient city of **Kapilavastu**, where Siddhartha Gautama spent his early life.
- **Row III is Correct:** Goalpara in **Assam** is home to the **Sri Surya Pahar**, a significant archaeological site known as the "Sacred Hills of the Sun God." This site is a unique confluence of three religions: Hinduism, Buddhism, and Jainism and features numerous rock-cut Shiva Lingas and sculptures dedicated to Surya (the Sun God). Local tradition suggests that there are 99,999 Shiva Lingas here, making it a "Kashi of the East" and a site of immense spiritual and historical value.
- **Row IV is Correct:** palampet in **Telangana** is the home of the world-famous **Ramappa Temple**, a masterpiece of **Kakatiya temple architecture** and a UNESCO World Heritage site. Built in the 13th century, the temple is renowned for its "floating bricks," intricate sandstone carvings, and polished basalt pillars. It is unique because it is named after its chief architect, Ramappa, rather than the presiding deity, showcasing the high social status of artists in that era.

Q 20. Ans: (a)

Explanation:

- **Baudhayana (I)** is the earliest among the four and belongs to the late Vedic period (around 800–500 BCE). His *Sulba Sutra* contains some of the earliest known statements of geometric principles, including an early form of the Pythagorean theorem. This places him firmly at the beginning of the sequence.
- **Aryabhata (II)** lived in the late 5th century CE (born in 476 CE) and was a towering figure in Indian mathematics and astronomy. His work *Aryabhatiya* introduced advanced trigonometry, accurate astronomical calculations, and the concept of Earth's rotation. Chronologically, he comes well after Baudhayana.
- **Bhaskaracharya (III)**, also known as Bhaskara II, lived in the 12th century CE (1114–1185 CE). His works, such as *Lilavati*, *Bijaganita*, and *Siddhanta Shiromani*, represent the peak of medieval Indian mathematics and astronomy. He clearly comes after Aryabhata.
- **IV. Dnyaneshwar (IV)** A 13th-century philosopher and saint-poet from Maharashtra, famous for his commentary on the *Bhagavad Gita* (*Dnyaneshwari*). He is also traditionally credited with the invention of the game *Moksha Patam* (Snakes and Ladders).

Q 21. Ans: (a)

Explanation:

- **Statement I is Correct:** Sautrāntika was a school of early Buddhism that emerged as a critical offshoot of the Sarvāstivāda tradition. The Sautrāntikas emphasized the authority of the sūtras (discourses of the Buddha) over later scholastic texts such as the Abhidharma. They rejected the Sarvāstivādin doctrine that past, present, and future phenomena all exist, arguing instead that only present momentary dharmas are real, while past and future exist only as conceptual constructions. Their philosophy strongly influenced later Buddhist epistemology and theories of perception.
- **Statement II is Correct: Sammitiya** was a major sub-school of the Pudgalavāda tradition in Buddhism. The defining feature of this school was the doctrine of the "**pudgala**" (**person**), which was considered neither identical with nor completely different from the five aggregates. The Sammitiyas introduced this concept to explain moral responsibility, rebirth, and continuity of personality without asserting a permanent soul. Although later Buddhist schools criticised this view as contradictory to the doctrine of non-self (anātman), the Sammitiya school was once very influential in India.
- **Statement III is Incorrect: Sarvāstivādin** was one of the most important early Buddhist schools, particularly dominant in north-western India and Central Asia. The central doctrine of this school was "**sarvam asti**", meaning "everything exists," which held that **past**,

present, and future dharmas all exist to account for causality and karmic continuity. They developed an extensive Abhidharma system that classified reality into fundamental elements. Their ideas deeply shaped Buddhist scholasticism and became the foundation for many later philosophical debates within Buddhism.

Q 22. Ans: (a)

Explanation:

The famous image of **Padmapani Bodhisattva** is one of the most celebrated paintings found in the Ajanta Caves in Maharashtra. These caves date mainly from the **5th century CE during the Vakataka period** and contain remarkable Buddhist murals and sculptures. Padmapani is depicted holding a **lotus (padma)**, which symbolizes purity and spiritual awakening in Buddhist symbolism. The painting represents the Bodhisattva as a compassionate being who delays his own enlightenment to help others achieve liberation. Because of its artistic excellence and emotional expression, this mural has become one of the most iconic examples of ancient Indian painting.

Q 23. Answer: (a)

Explanation:

- **Statement I is Correct:** Human Papillomavirus (HPV) is one of the most common viral infections worldwide and is the primary cause of cervical cancer. Persistent infection with high-risk HPV types can also lead to other cancers, such as anal, oropharyngeal, and penile cancers. Hence, the statement is factually correct.
- **Statement II is Correct:** While often associated with cervical cancer prevention in women, HPV also causes genital warts and various cancers in men (penile, anal, and oropharyngeal). Administering the vaccine to boys and men helps protect them directly and reduces the overall transmission of the virus in the population
- **Statement III is Incorrect: Shanchol is not an HPV vaccine;** it is an oral vaccine used against **cholera**. India's first indigenous HPV vaccine is **Cervavac**, developed by the Serum Institute of India. Hence, this statement is incorrect.

Q 24. Ans: (a)

Explanation:

- **Statement I is Incorrect:** The World Intellectual Foundation, established in January 2021, is a global, non-partisan and sector-agnostic think tank that aims to create an ecosystem that brings together diverse stakeholders with large-canvas thinking for the collective benefit of society. An intergovernmental organisation (like the UN or WTO) is established by a treaty between sovereign states. Since this foundation is an independent body that “nudges” governments rather than being run by them, it

does not qualify as an intergovernmental organisation.

- **Statement II is Correct:** The World Intellectual Foundation is known for developing and publishing the **Responsible Nations Index** (often referred to in academic circles as the Global Responsible State Index). This index is designed to evaluate how nations contribute to the collective benefit of society, aligning with the foundation's goal of encouraging “planet-friendly policies” and ethical governance on a global scale.
- **Statement III is Incorrect:** The implementation and administration of the Paris Convention on Intellectual Property Rights is the sole responsibility of the World Intellectual Property Organization (WIPO), a UN specialised agency. A private think tank or foundation, no matter how influential, does not have the legal authority to implement or enforce international treaties or conventions on intellectual property.

Q 25. Answer: (a)

Explanation:

- **Statement I is Correct:** most commercial nuclear reactors require uranium with a higher concentration of the fissile isotope **U-235** than what occurs naturally. Natural uranium contains only about 0.7% U-235 and roughly 99.3% U-238, which is not directly usable for efficient energy production in light-water reactors. To increase the proportion of U-235 to about 3–5%, the uranium must be enriched so that a sustained and controlled fission reaction can occur in a reactor core. Without this increase in U-235 concentration, the reactor would not operate effectively.
- **Statement II is Correct:** Uranium oxide from the mine cannot be directly enriched because it is a solid and difficult to separate isotopes in that form. Therefore, the uranium oxide must first be chemically converted into **uranium hexafluoride (UF₆)**, which becomes a gas at relatively low temperatures. This gaseous form is necessary because enrichment techniques — such as centrifuges — work by exploiting the tiny mass difference between U-235 and U-238 isotopes in a gas. Only in gaseous form can these isotopes be separated efficiently.

Q 26. Ans: (c)

Explanation:

- **Statement I is Correct: Dynamic Random Access Memory (DRAM)** is a volatile memory that stores data temporarily and requires continuous power to maintain the stored information. If power is lost, all stored data disappears. In contrast, **NAND Flash Memory** is non-volatile, meaning it can retain data even when the device is switched off. Because of this property, NAND is widely used for long-term storage.
- **Statement II is Correct: Dynamic Random Access Memory (DRAM)** functions as the primary working

memory in computers, smartphones, and servers where quick access to data is required during processing. It temporarily stores data and instructions that the processor needs immediately. **NAND Flash Memory**, however, is mainly used for storage technologies such as solid-state drives (SSDs), memory cards, and USB flash drives, where data must remain stored for long periods.

Q 27. Ans: (a)

Explanation:

- **Statement I is Incorrect:** **Arjun** is actually a **Main Battle Tank (MBT)**, not an aircraft. Developed by the Defence Research and Development Organisation (DRDO) for the Indian Army, it features a powerful 120mm rifled gun and indigenous “Kanchan” composite armour. The **Tejas**, which is India’s indigenously produced Light Combat Aircraft (LCA).
- **Statement II is Incorrect:** Saras is an indigenously developed Civil Aircraft, not a military one. While it can be used for various roles, its primary design by the National Aerospace Laboratories (NAL) is for regional connectivity, air taxis, and commuter transport in the civilian sector.
- **Statement III is Correct:** The **Chinook** (specifically the CH-47) is a massive **military heavy-lift helicopter**. It is easily recognisable by its tandem rotor design (one set of blades at the front and one at the back). It is used by the Indian Air Force and many others globally to transport heavy machinery, artillery, and large groups of troops into high-altitude or difficult-to-reach zones.
- **Statement IV is Incorrect:** The Apache (AH-64) is an Attack Helicopter, not a cargo plane. It is a specialised tank-killer equipped with Hellfire missiles and a 30mm chain gun. It is designed for front-line combat, equipped with a chain gun, Hellfire missiles, and advanced sensors to destroy enemy tanks and infrastructure. It has no role in civilian cargo transport.

Q 28. Ans: (d)

Explanation:

- **Statement I is Correct:** Zirconium is a transition metal that is absolutely vital for **nuclear reactor development** because of its incredibly low absorption cross-section for thermal neutrons. This means it doesn’t “steal” the neutrons needed to keep the nuclear chain reaction going. It is primarily used to make “cladding” (the outer layer) for nuclear fuel rods because it is also highly resistant to corrosion and high temperatures inside the reactor.
- **Statement II is Correct:** In India, Zirconium is mainly derived from the mineral **Zircon**, which is found in the **heavy mineral beach sands** of Kerala, as well as parts of Tamil Nadu and Odisha. These coastal deposits are part of India’s “monazite” and “ilmenite” rich sands.

The Department of Atomic Energy (DAE) monitors these areas closely because Zircon is classified as a “prescribed substance” under the Atomic Energy Act.

- **Statement III is Incorrect:** India is **not** the top producer of Zirconium after China. While India has one of the largest *reserves* of Zircon in the world, the actual production is currently dominated by **Australia and South Africa**. China is a major consumer and processor, but in terms of mining the raw mineral, Australia consistently leads the global market. India’s production is significant but mostly focused on meeting domestic strategic needs for its three-stage nuclear power program.

Q 29. Ans: (c)

Explanation

- **Statement I is Incorrect:** The New Delhi Declaration is a landmark agreement, but it is not the first global declaration on AI. It was preceded by several major international frameworks, most notably the Bletchley Declaration (UK, 2023) and the Seoul Declaration (South Korea, 2024). The New Delhi version is unique for its focus on “AI for All” and the Global South, but it follows an established lineage of global AI governance efforts
- **Statement II is Incorrect:** The principal theme mentioned in the official declaration was actually “**Sarvajan Hitaya, Sarvajan Sukhaya**” (Welfare for all, Happiness for all), not “Bahujan.” While the phrases are similar in spirit, the summit specifically utilized the “Sarvajan” (Everyone) terminology to emphasize universal, global inclusivity. This distinction highlights India’s push for a framework that leaves no nation or community behind in the AI race
- **Statement III is Correct:** The New Delhi Declaration is uniquely structured around Seven Pillars, also referred to as the Seven Chakras of Action. These pillars—ranging from Democratizing AI Resources to Human Capital Development—provide a comprehensive roadmap for international cooperation. They were designed to balance the need for innovation and economic growth with the necessity of safety, security, and ethical guardrails

Q 30. Ans: (c)

Explanation:

- Kozhikode, Port Blair, Amritsar, and Surat are officially designated as international airports and handle or are authorised to handle international operations. Adampur Airport, on the other hand, primarily serves domestic civilian flights and military purposes and does not have international airport status. Therefore, out of the five airports listed, **four are recognised as international airports.**

Q 31. Ans: (d)

Explanation:

- **Statement 1 is Correct:** Prevention is the cornerstone of the PRAHAAR strategy, focusing on neutralizing threats before they manifest. By leveraging a robust intelligence network involving the Intelligence Bureau (IB) and R&AW, India aims to identify terror modules in their infancy. This proactive stance ensures the safety of Indian citizens and protects critical national infrastructure from physical and cyber disruptions.
- **Statement 2 is Correct:** India's counter-terrorism policy has shifted toward a "Zero Tolerance" approach, ensuring that any act of terror meets a swift and calibrated response. This includes high-readiness kinetic operations by specialized units like the National Security Guard (NSG) and surgical precision strikes when necessary. The goal is to maintain a credible deterrent by making the cost of terrorism prohibitively high for perpetrators and their handlers.
- **Statement 3 is Correct:** The "Whole-of-Government" approach is a strategic shift that aggregates internal capacities across federal and state levels. By integrating the National Investigation Agency (NIA) with state-level Anti-Terror Squads (ATS) and utilizing the NATGRID (National Intelligence Grid), the government breaks down departmental silos. This unified coordination allows for seamless information sharing and a synchronized response to complex, multi-state terror networks.
- **Statement 4 is Correct:** India maintains that the fight against terror must be conducted within the Rule of Law to ensure long-term legitimacy. Adherence to human rights and legal processes, even under the UAPA (Unlawful Activities Prevention Act), prevents the alienation of local populations and maintains the moral high ground. This constitutional approach ensures that the state's actions are sustainable and globally recognized as a fight against criminality rather than a compromise of civil liberties.

Q 32. Ans: (c)

Explanation:

- **G-15 (Group of Fifteen) — India has held the Chairmanship:** India was a founding member of the G-15, established in 1989 to promote South-South cooperation. India has hosted the G-15 Summit in New Delhi (notably the 4th Summit in 1994) and served as the grouping's chair. The group functions as a bridge between developing nations and the G-7.
- **G-7 (Group of Seven) — India has NOT held the Presidency:** The G-7 consists of seven advanced economies: Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States. Since India is not a member, it cannot hold the presidency. However,

India is a regular "Guest Country," and in 2026, French President Emmanuel Macron notably framed India as an essential bridge between the G-7 and the Global South.

- **G-20 (Group of Twenty) — India has held the Presidency:** India held the G-20 Presidency from **December 1, 2022, to November 30, 2023**. The 18th G-20 Summit was held in New Delhi in September 2023 under the theme "*Vasudhaiva Kutumbakam*" (One Earth, One Family, One Future). A major achievement of this presidency was the permanent inclusion of the African Union into the G-20.
- **IV. BRICS — India has held the Chairmanship:** India has held the BRICS chairmanship multiple times, specifically in **2012, 2016, and 2021**. Most recently, India assumed the BRICS chairmanship again on **January 1, 2026**. Under the theme "*Building for Resilience, Innovation, Cooperation and Sustainability*," India is hosting the 18th BRICS Summit in New Delhi later this year.

Q 33. Ans: (c)

Explanation:

- **Statement I is Correct:** C. Rajagopalachari served as the **first and only Indian Governor-General** of independent India from June 1948 to January 1950. He succeeded Lord Mountbatten and held the office until the Republic of India was established and Dr. Rajendra Prasad was sworn in as the first President. This transition marked a significant symbolic moment in the decolonization of India's constitutional machinery.
- **Statement II is Correct;** In 1959, Rajaji founded the **Swatantra Party** as a liberal alternative to the dominant Congress Party's socialist policies. He championed individual liberty, free-market principles, and the abolition of the "Permit-License Raj." The party briefly became the single largest opposition group in the Lok Sabha during the 1960s, reflecting its enduring influence on India's economic and political discourse.
- **Statement III is Correct:** In 1954, Rajaji was among the **first three recipients of the Bharat Ratna**, India's highest civilian award, alongside Dr. Sarvepalli Radhakrishnan and Dr. C.V. Raman. This honor recognized his immense contribution to the Indian independence movement and his service as a statesman. His multifaceted career as a freedom fighter and a brilliant administrator made him a natural choice for this inaugural honor.

Q 34. Ans: (a)

Explanation:

- **Statement I is Correct:** The agreement was signed on November 12, 1893, between Sir Mortimer Durand (Foreign Secretary of British India) and Amir Abdur Rahman Khan of Afghanistan. It was intended to fix the limits of their respective spheres of influence.

- **Statement II is Incorrect:** The agreement specifically defined the **Wakhan Corridor** a narrow strip of land in northeastern Afghanistan to serve as a **buffer zone between British and Russian empire**. During the “Great Game,” this was a deliberate move by the British to ensure that the Russian Empire and the British Indian Empire did not share a direct physical border. The corridor instead separated the British territories from the Pamir region controlled by the Russians.
- **Statement III is Incorrect:** the **Taliban (both in the 1990s and after 2021)** has consistently **refused to recognise** the Durand Line as an official international border. Like previous Afghan governments, the Taliban views it as a “colonial imposition” that artificially divides the Pashtun tribes. This has led to frequent border skirmishes and the removal of fencing by Taliban fighters along the Pakistan-Afghanistan frontier.

Q 35. Ans: (b)

Explanation:

- **Statement I is Incorrect:** Exercise DHARMA GUARDIAN is a joint military exercise conducted between the **Indian Army and the Japan Ground Self-Defense Force (JGSDF)**. It began in 2018 to foster military cooperation amid growing security challenges in the Indo-Pacific region. Exercises with the Nepal Army are specifically titled “**Exercise SURYA KIRAN,**” making this statement factually wrong regarding the participating nations.
- **Statement II is Correct:** The primary focus of this exercise is to enhance **interoperability** and joint operational capabilities, specifically in **counter-terrorism** and disaster relief operations. The training modules are designed for **semi-urban and mountainous terrain**, allowing both forces to share best practices in tactical maneuvers, drone integration, and house-clearing drills. This alignment is crucial for both nations as they navigate complex security environments in Asia.
- **Statement III is Correct:** The most recent editions of the exercise have been held at the **Foreign Training Node in Chaubattia, Uttarakhand**, as well as locations in Japan (like Camp Imazu). Chaubattia provides the ideal high-altitude, rugged terrain required to simulate the “semi-urban” combat conditions specified in the exercise’s objectives. These concluding phases typically involve a 48-hour-long validation exercise to test the combined skills of the troops.

Q 36. Ans: (c)

Explanation:

- **Statement I is Correct:** The Detritus Food Chain (DFC) starts with detritus, which is dead organic matter. This includes fallen leaves, twigs, and remains of animals. This distinguishes it from the Grazing Food Chain (GFC),

which begins with living autotrophs (green plants).

- **Statement II is Correct:** The DFC does not directly use solar energy for photosynthesis (unlike plants), it is indirectly dependent on it. The detritus food chain (DFC) begins with dead organic matter. It is made up of decomposers which are heterotrophic organisms, mainly fungi and bacteria. They meet their energy and nutrient requirements by degrading dead organic matter or detritus.
- **Statement III is Correct:** The primary organisms in the DFC are saprotrophs (decomposers), mainly fungi and bacteria. They meet their energy and nutrient requirements by degrading dead organic matter or detritus through the secretion of digestive enzymes that break down complex organic materials into simple, inorganic substances.

Q 37. Ans: (b)

Explanation:

- **Statement I is Incorrect:** Galathea National Park is located on **Great Nicobar Island**, the largest and southernmost island in the Nicobar archipelago. It is part of the **Great Nicobar Biosphere Reserve**. Little Nicobar is a separate island to the north.
- **Statement II is Correct:** Galathea Bay is world-renowned as one of the most important nesting sites for the **Giant Leatherback Turtle**. The park’s coastal area also features vibrant **mangrove** systems (especially around the Galathea River estuary) and rich **coral habitats**, which provide a unique marine-terrestrial interface.
- **Statement III is Incorrect:** The vegetation of Galathea National Park is primarily characterized by **Tropical Evergreen and Semi-Evergreen forests**. Due to high rainfall (3000 to 3500 mm) and a tropical climate, it lacks a true “deciduous” season where trees shed leaves. The park is often cited as having some of the best-preserved **tropical rainforests** in the world.

Q 38. Ans: (a)

Explanation:

- **Statement I is Correct:** Antarctic krill are the **keystone species** of the Southern Ocean. They serve as the primary link between microscopic phytoplankton and large predators. Whales, seals, and various species of penguins (Adélie, Chinstrap) depend almost exclusively on krill for their diet. A decline in krill biomass directly translates to a collapse in the population of these higher-order consumers.
- **Statement II is Correct:** Sea ice is not just a platform for seals; it is the **cradle of the krill life cycle**. The complex underside of sea ice provides a “nursery” where larval and juvenile krill can hide from predators. Furthermore, it serves as a feeding ground where they graze on concentrated food sources.

- **Statement III is Correct:** Sea ice acts as a substrate for **ice algae**. These algae bloom on the underside of the ice during the spring and summer. During the winter, when food in the open ocean is scarce, krill survive by scraping these algae off the ice.
- **Statement II** explains how the reduction of sea ice leads to a decline in krill (by removing those feeding/nursery grounds). **Statement III** explains why sea ice is important (it hosts the food).

Q 39. Ans: (d)

Explanation:

- The 2026 Rules represent a significant update to India's waste management framework, focusing on the "Circular Economy" and digital accountability.
- **Statement I is Correct:** Four-stream segregation of solid waste at source has been made mandatory under the SWM Rules, 2026. Waste is required to be segregated into wet waste(kitchen waste, vegetables, fruit peels, meat, flowers, etc.), dry waste(plastic, paper, metal, glass, wood and rubber, etc.), sanitary waste(diapers, sanitary towels, tampons and condoms, etc.) and special care waste(paint cans, bulbs, mercury thermometers and medicines, etc.).
- **Statement II is Correct:** This is a core environmental law principle embedded in the rules. It mandates that the cost of waste management, including collection and environmental remediation, should be borne by the waste generators. This is operationalized through User Fees and Spot Fines levied by local bodies.
- **Statement III is Correct:** The rules also provide for the development of a Centralised Online Portal to track all stages of solid waste management, including waste generation, collection, transportation, processing and disposal, as well as biomining and bioremediation of legacy waste dump sites.
- **Statement IV is Correct:** The new rules also introduce Extended Bulk Waste Generator Responsibility (EBWGR), under which bulk waste generators are made accountable for the solid waste generated by them. Bulk Waste Generators are required to process wet waste on-site as far as possible or obtain an EBWGR certificate where on-site processing is not feasible.

Q 40. Ans: (c)

Explanation:

- **Pair 1 is Correct:** Udaipur Jheel in Bihar's West Champaran district was designated as a Ramsar site on May 13, 2025, covering 319 hectares as a wetland of international importance.
- **Pair 2 is Correct:** Chhari Dhand Conservation Reserve is a premier 227-square-kilometer seasonal wetland in Kutch, Gujarat, India, renowned for hosting over 370 bird species. Situated near Fulay village on the edge of

the Banni grasslands and Rann of Kutch, it is a vital wintering spot for flamingos, pelicans, and raptors. This site was added to the Ramsar list in 2026.

- **Pair 3 is Incorrect:** Kopra Jalashay, located in the Bilaspur district of Chhattisgarh, is a significant reservoir and the state's first designated Ramsar wetland site. It was added to the list of Ramsar sites in 2025.
- **Pair 4 is Incorrect:** Siliserh Lake is located in the Alwar district of Rajasthan, not Punjab. It was added to the list of Ramsar sites in 2025.
- **Pair 5 is Correct:** This is a well-known Ramsar site located in the Gurgaon district of Haryana. It was added to the Ramsar list in 2021. The wetland harbours a rich plant and animal life: it supports more than 220 species of resident, winter migratory and local migratory waterbirds at critical stages of their life cycles

Q 41. Ans: (c)

Explanation:

- **Statement I is Correct:** Precipitation is the culmination of a cooling process. When air reaches a state of **saturation**, the water vapor begins to transform into liquid droplets or ice crystals through **condensation** (on condensation nuclei). Once these droplets grow large enough to overcome atmospheric updrafts, they fall as precipitation.
- **Statement II is Incorrect:** Relative humidity (RH) is the ratio of the actual water vapor present to the maximum amount the air can hold at that specific temperature. When **RH reaches 100%**, the air is at its **saturation point** (also known as the Dew Point). At this specific point, the air's moisture-holding capacity is fully utilized.

Q 42. Ans: (c)

Explanation:

- **Statement I is Correct:** While Mars once had a magnetic field (evidenced by magnetized rocks in its crust), its smaller size caused it to cool much faster than Earth. Today, its core is largely solid or lacks the vigorous convection of a liquid interior necessary to drive a planetary dynamo.
- **Statement II is Correct:** Venus is nearly the size of Earth and likely has a liquid metallic core. However, it rotates extremely slowly (one Venusian day is longer than its year). Venus has a liquid core, but rotates too slowly to churn significant convection currents and thus has a weak magnetic field.
- **Statement III is Correct:** Among the terrestrial (rocky) planets - Mercury, Venus, Earth, and Mars, Earth possesses the strongest intrinsic magnetic field. Venus and Mars have almost no internal dynamo, and Mercury's field is about 1% as strong as Earth's.

Q 43. Ans: (b)

Explanation:

All three locations are examples of **Hotspot Volcanism**.

- **Hawaii:** Formed by the Pacific Plate moving over the Hawaii hotspot.
- **Samoa:** Result of the Samoa hotspot in the South Pacific.
- **Réunion:** Located in the Indian Ocean, it is formed by the Réunion hotspot (which is also famously linked to the creation of the Deccan Traps in India millions of years ago).
- **Deccan Traps:** This is a “Flood Basalt” province. Millions of years ago, as the Indian Plate migrated northward toward Asia, it passed over the **Réunion Hotspot**. The massive volcanic activity triggered by the hotspot created the layers of basalt we now call the Deccan Traps.

Q 44. Ans: (c)

Explanation:

- **Statement I is Correct:** Seismic waves are divided into Body waves (P and S waves) and Surface waves. Body waves travel through the Earth’s deep layers, and their speed/direction changes tell us about the core and mantle. Surface waves are “trapped” at the interface of the crust and do not penetrate deep into the Earth, therefore they provide little to no information about the deep interior.
- **Statement II is Correct:** While Body waves arrive first, Surface waves have much higher amplitudes (larger ground displacement). Because they propagate in two dimensions along the surface (rather than three dimensions like body waves), they lose energy (dissipate) more slowly over distance, making them responsible for the most severe damage to infrastructure.
- **Statement III is Correct:** There are two main types of surface waves. **Love waves** cause horizontal, side-to-side shifting of the ground. **Rayleigh waves** move in an elliptical, rolling motion, similar to ocean waves, and are often the most destructive.

Q 45. Ans: (a)

Explanation:

- **Pair I is Correct:** The **Llanos** are vast tropical grasslands located in the northern part of South America, primarily in **Venezuela and Colombia**. They are situated within the drainage basin of the **Orinoco River**.
- **Pair II is Incorrect:** The **Pampas** are fertile temperate grasslands located in South America, covering parts of Argentina, Uruguay, and Brazil. They are associated with the **Paraná–La Plata** river system.
- **Pair III is Incorrect:** The **Veld** (or **Velds**) refers to the wide-open temperate grasslands of South Africa. They are drained by the **Orange and Vaal** rivers..

Q 46. Ans: (d)

Explanation:

- **Statement I is Correct:** One aspect of the Rule of Law is that the government must act according to the law of the land. The Forest Rights Act (FRA) recognizes the pre-existing rights of forest dwellers, moving away from arbitrary state control of forests to a **legally defined framework** for rights and titles. It ensures that the state cannot arbitrarily displace people without following the due process of law.
- **Statement II is Correct: Equality before the Law** (Article 14 of the Indian Constitution) implies the absence of special privileges. Under the Rule of Law, no person is above the law, and every person, regardless of their rank or condition, is subject to the ordinary law of the realm and amenable to the jurisdiction of the ordinary tribunals.
- **Statement III is Correct:** In the Indian context, Judicial Review is a “Basic Structure” of the Constitution. It acts as a check on the arbitrary exercise of power by the Legislature and Executive. By ensuring that every law passed or action taken conforms to the Constitution, Judicial Review upholds the **Supremacy of Law**, a fundamental requirement for the Rule of Law to exist.

Q 47. Ans: (c)

Explanation:

- **Statement I is Correct:** While the Indian Constitution does not have a strict, water-tight separation of powers like the US Constitution, it does contain an **explicit directive** in the Directive Principles of State Policy (DPSP). **Article 50** of the Constitution of India states: “The State shall take steps to separate the judiciary from the executive in the public services of the State.”
- **Statement II is Correct:** The Supreme Court of India has held in several landmark cases - most notably in **Kesavananda Bharati v. State of Kerala (1973)** and reinforced in **Indira Gandhi v. Raj Narain (1975)**—that the **Separation of Powers** is an essential feature of the Constitution. Therefore, it forms part of the **Basic Structure doctrine**, meaning it cannot be destroyed or abrogated even by a Constitutional Amendment.

Q 48. Ans: (b)

Explanation:

- **Statement I is Incorrect:** Freedom of speech and expression is a **Fundamental Right** under **Article 19(1)(a)**. The “reasonable restrictions” (including public order) are provided under **Article 19(2)**. While these restrictions might be a subject of legal debate, they pertain to the Part III (Fundamental Rights) framework, not the Part IV (DPSPs) framework.

- **Statement II is Correct:** Article 39(d) of the DPSPs specifically directs the State to ensure that there is “equal pay for equal work for both men and women.” A policy or situation that denies this would be a direct failure to implement this specific Directive Principle.
- **Statement III is Correct:** Article 39A (inserted by the 42nd Amendment Act, 1976) mandates that the State shall provide **free legal aid** by suitable legislation or schemes to ensure that opportunities for securing justice are not denied to any citizen by reason of economic or other disabilities. Failure to do so is a violation of this directive.
- **Statement IV is Incorrect:** This is a **Fundamental Duty** of a parent or guardian under Article 51A(k) (added by the 86th Amendment Act, 2002). While the State has a DPSP to provide early childhood care (Article 45), the specific obligation of a parent to provide opportunities for education is a Duty, not a Directive Principle.

Q 49. Ans: (b)

Explanation

- **Option (a) is incorrect.** This option describes a practice more commonly criticized in the context of **breast cancer awareness campaigns**, where companies market products using pink ribbons but donate only a negligible portion of profits to actual cancer research or patient support.
- **Option (b) is correct.** **Pinkwashing** refers to the strategy whereby a government, corporation, or institution publicly promotes its support for LGBTQ+ rights to cultivate a progressive and inclusive image, often to deflect criticism regarding unrelated human rights violations, discriminatory policies, environmental damage, or political controversies. The emphasis is on **image management through selective highlighting of LGBTQ+ friendliness**, rather than genuine, consistent commitment to equality.
- **Option (c) is Incorrect:** Underreporting gender-based crimes to maintain a positive global image relates to **data manipulation, governance transparency issues, or suppression of information**. While it may reflect attempts at image management, it has **no specific connection to LGBTQ+ rights promotion**, which is central to the concept of pinkwashing. Hence, this option describes a different governance malpractice.
- **Option (d) is Incorrect:** Reserving a fixed percentage of corporate board positions for women refers to **gender diversity policies or affirmative action measures** aimed at increasing women’s representation in leadership. This is a structural reform measure focused on gender equality in corporate governance and is unrelated to strategic LGBTQ+ image projection. Therefore, it does not align with the meaning of pinkwashing.

Q 50. Ans: (b)

Explanation:

- **Option (a) is Correct: Equality before law** ensures that no person is above the law and all are subject to ordinary courts of law. It is a negative concept implying the absence of any special privileges in favor of any individual. It signifies the equal subjection of all persons to the ordinary law of the land administered by ordinary law courts.
- **Option (b) is Incorrect:** While Article 14 forbids class legislation, it permits **reasonable classification**. For a classification to be “reasonable,” it must pass the **Twin Test**:
 1. It must be founded on an **intelligible differentia** (distinguishable feature).
 2. That differentia must have a **rational nexus** (logical link) to the object sought to be achieved by the statute.
- **Option (c) is correct:** The concept of “**Equality before Law**” is of **British origin** (derived from A.V. Dicey’s ‘Rule of Law’). It is the second expression in Article 14, “**Equal Protection of the Laws,**” that has been taken from the **American Constitution**.
- **Option (d) is Correct:** Article 14 is a protection against the “State.” Therefore, any arbitrary action by the **Executive** (government orders) or any discriminatory law passed by the **Legislature** can be declared unconstitutional if it violates the mandate of equality.

Q 51. Ans: (b)

Explanation:

- **Statement I is Incorrect:** In political theory, Liberty is not “absolute freedom” or the “absence of all restraints.” In a constitutional democracy, Liberty is defined as the absence of unreasonable restraints on the activities of individuals, coupled with the providing of opportunities for the development of individual personalities. It is always subject to constitutional limitations (such as the “Reasonable Restrictions” under Article 19 in India) to ensure the rights of others are protected.
- **Statement II is Correct:** Equality is defined as:
 - ✓ Absence of special privileges for any section of society.
 - ✓ Provision of adequate opportunities for all individuals without discrimination.

Q 52. Ans: (c)

Explanation:

- **Statement I is Correct:** Nanotechnology is revolutionizing agriculture through nano-fertilizers and nano-pesticides that allow for “smart” targeted delivery, reducing chemical runoff. In the food sector, nanosensors in packaging can detect pathogens or gas leaks (indicating spoilage), and nano-encapsulation improves the shelf-life and nutrient delivery of food products.

- **Statement II is Correct:** In healthcare, nanotechnology offers breakthrough solutions for diabetes management. This includes nano-biosensors for continuous, non-invasive glucose monitoring (reducing the need for finger-pricking) and nanocarbon-based delivery systems (like “smart” insulin patches) that release insulin automatically in response to blood sugar levels.
- **Statement III is Correct:** Nanotechnology allows for LEDs that are significantly more energy-efficient and produce more vibrant, accurate colors. Carbon nanotubes (CNTs) are used to create cold cathode X-ray sources. Unlike traditional X-ray tubes that require high heat, nano-based X-rays are smaller, use less power, and can be turned on and off instantly, allowing for sharper images and portable medical devices.

- **Statement III is Correct:** In modern research, hydrogels serve as a “scaffold” (a 3D frame) that mimics the extracellular matrix. This allows scientists to grow cells (like stem cells or cancer cells) in a 3D environment rather than a flat dish, which is much closer to how cells behave inside a human body.

Q 53. Ans: (d)

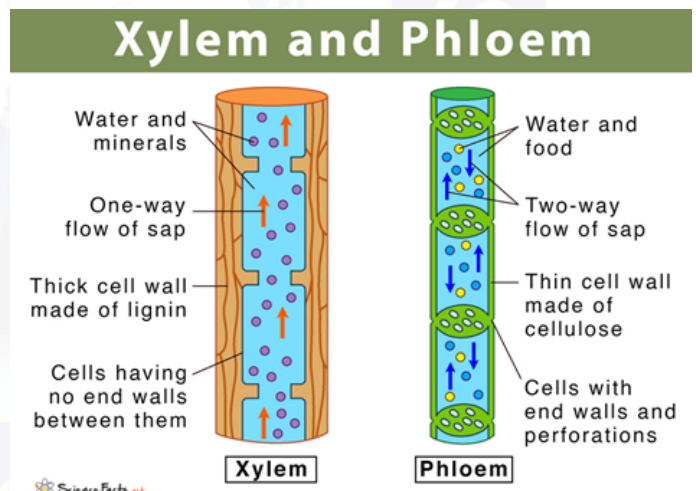
Explanation:

- The Centre launched its BioE3 (Biotechnology for Economy, Environment and Employment) policy last year for ‘Fostering High Performance Biomanufacturing’. The policy seeks to achieve this by harnessing the power of biotechnology, and developing new manufacturing methods that replicate, or mimic, processes found in natural biological systems.
- **Statement I is Correct:** One of the three “Es” in the policy stands for Employment. The policy aims to generate significant job opportunities, particularly in tier-II and tier-III cities, by establishing bio-manufacturing hubs.
- **Statement II is Correct:** The second “E” stands for Economy. The policy is designed to accelerate India’s transition to a bio-economy, aiming for a substantial contribution to the GDP through bio-based products and processes.
- **Statement III is Incorrect:** While bio-energy is a sub-sector that benefits from biotechnology”, Empowerment “is not one of the three pillars of the BioE3 policy name.
- **Statement IV is Correct:** The third “E” stands for Environment. The policy focuses on “Net Zero” goals, climate change mitigation, and circular bio-economy practices to ensure environmental sustainability.

Q 55. Ans: (b)

Explanation:

- **Pair I is Correct:** Xylem functions as a conducting tissue for water and minerals from roots to the stem and leaves. It consists of tracheids, vessels, xylem parenchyma, and xylem fibres. It provides mechanical strength to the plant parts.
- **Pair II is Correct:** Phloem is the vascular tissue responsible for translocation (transport of food, primarily sucrose) from the “source” (leaves where photosynthesis occurs) to the “sink” (roots, fruits, and growing points).
- **Pair III is Incorrect:** Vascular cambium is a type of **lateral meristem**. Its primary function is to produce secondary xylem (wood) and secondary phloem, which increases **the girth** (thickness) of the stems and roots. This process is known as secondary growth and is characteristic of dicots and gymnosperms.



Q 56. Ans: (c)

Explanation:

- Jerdon’s Courser is an extremely rare nocturnal bird endemic to Andhra Pradesh, India. It was thought to be extinct until its rediscovery in 1986. It belongs to the family Glareolidae. The Greater Adjutant Stork is a large member of the stork family. In India, it is primarily found in Assam and Bihar. It is characterized by its massive bill and a distinctive neck pouch. Sooty Shearwater is a medium-to-large seabird known for its incredible long-distance migrations. It belongs to the family Procellariidae and spends most of its life at sea, coming to land only to breed.

Q 54. Ans: (d)

Explanation:

- **Statement I is Correct:** Hydrogels act as “smart” carriers. They can encapsulate drugs (like insulin or cancer medication) and release them slowly over a sustained period (e.g., up to 168 hours) or in response to specific triggers like pH or temperature changes.
- **Statement II is Correct:** Because they are soft, porous, and moist, hydrogels provide an ideal environment for healing. They protect the wound, absorb excess fluid, and can even be “sprayed” or “injected” to cover irregular injury sites.

Q 57. Ans: (d)

Explanation:

- Mahatma Gandhi started the Dandi March on March 12, 1930, and reached Dandi on April 6, 1930, to break the salt law. This act marked the formal beginning of the Civil Disobedience Movement. Under the presidency of Jawaharlal Nehru, the Indian National Congress passed the historic “Poorna Swaraj” (Complete Independence) resolution. The Congress committee at Lahore authorized the Working Committee to launch a programme of Civil Disobedience, including non-payment of taxes. Gandhi was given the authority to lead this movement, which he decided to initiate through the symbolic issue of the Salt Tax.

Q 58. Ans: (c)

Explanation:

- **Statement I is Correct:** The Act ended the activities of the East India Company as a commercial body. It became a purely administrative and political body. Its monopoly over tea trade and trade with China (which was partially retained in the 1813 Act) was completely abolished.
- **Statement II is Correct:** The Act elevated the Governor-General of Bengal to the Governor-General of India (Lord William Bentinck was the first). It vested in him all civil and military powers. Crucially, it took away the legislative powers of the Governors of Bombay and Madras, empowering the Governor-General in Council to legislate for the entirety of British India.
- **Statement III is Correct:** The Act provided for the addition of a fourth member (the Law Member) to the Governor-General’s Council. This led to the appointment of the First Law Commission in 1834, with Lord Macaulay as its chairman, specifically to codify Indian laws.

Q 59. Ans: (b)

Explanation:

- **Pair I is Correct:** The Justice Party (officially the South Indian Liberal Federation) was founded in 1916 in the Madras Presidency. Its key founding leaders were Dr. T. M. Nair, P. Theagaraya Chetty, and C. Natesa Mudaliar. It represented the interests of non-Brahmins.
- **Pair II is Incorrect:** The Swaraj Party was formed in January 1923 by C. R. Das (President) and Motilal Nehru (Secretary) after the Gaya session of the Congress. Swami Satyadev Parivrajak was an activist associated with the Arya Samaj and the freedom struggle, but he was not a founding leader or primary face of the Swaraj Party.
- **Pair III is Incorrect:** The Unionist Party in Punjab was a secular party representing the interests of landed gentry and farmers. Its prominent leaders were Sir Fazl-i-Hussain, Sir Chhotu Ram, and Sir Sikandar Hyat

Khan. Lala Lajpat Rai was a prominent leader of the Indian National Congress and the Hindu Mahasabha movement, and he was often a political opponent of the Unionist Party’s policies.

- **Pair IV is Correct:** The Bharatiya Jana Sangh (BJS) was founded in 1951. Dr. Shyama Prasad Mukherjee was its founder-president. The party was the ideological precursor to the modern-day Bharatiya Janata Party (BJP).

Q 60. Ans: (b)

Explanation:

It was written by Bankim Chandra Chatterjee in the 1870s and was later included in his famous 1882 novel, Anandamath. The song played a central role in the novel’s depiction of a sanyasi rebellion against the British and their proxies. Vande Mataram was originally composed by Bankim Chandra Chatterjee in a mix of Sanskrit and Bengali. It was never composed in Persian. Vande Mataram was adopted as the National Song (Rashtriya Geet) of India on January 24, 1950.

Q 61. Ans: (d)

Explanation:

- **Statement I is Incorrect:** Late 18th and early 19th-century tribal movements (such as the Pahariyas, Chuar, and Santhal rebellions) were localized and ethnocentric in nature. They were not “pan-Indian” and did not seek to establish a “centralized political authority.” Instead, they aimed at restoring their traditional autonomy. Their leadership was confined to specific tribes or regions.
- **Statement II is Correct:** These uprisings were direct reactions to the British land revenue systems (like the Permanent Settlement), which replaced traditional tribal land systems with private property. This allowed the entry of “Dikus” (outsiders like moneylenders, traders, and revenue farmers) who exploited the tribals. British interference in their traditional forest rights and socio-religious customs served as the primary triggers for violence.

Q 62. Ans: (c)

Explanation:

- **Statement 1 is Correct:** Call Money Market is a market for very short-term funds, usually overnight or up to 14 days (Notice Money). It is a core component of the money market used by banks to meet temporary liquidity mismatches.
- **Statement 2 is Correct:** Treasury Bills (T-Bills) are short-term debt instruments issued by the Government of India. They are issued in three tenures: 91 days, 182 days, and 364 days. Since the maturity is less than one year, it is a primary money market instrument.
- **Statement 3 is Correct:** Commercial Bills are negotiable instruments drawn by a seller (drawer) on the buyer

(drawee) for the value of goods delivered. These are typically short-term (90 days) and can be discounted with banks, making them a part of the money market.

- **Statement 4 is Incorrect:** Government Bonds (also known as Dated Securities or G-Secs) generally have a long-term maturity ranging from 5 years to 40 years. Therefore, they are the primary component of the Gilt-edged Market, which is a part of the Capital Market, not the money market.

Q 63. Ans: (a)

Explanation:

- **Statement I is Correct:** Bonds are debt instruments in which the buyer is lending money to the company. Stocks represent equity, the buyer is purchasing a portion of the company's capital.
- **Statement II is Correct:** As lenders, bondholders are entitled to a fixed coupon rate (interest) regardless of whether the company makes a profit or loss. Since they are not owners, they do not participate in the decision-making process and generally do not have voting rights.
- **Statement III is correct:** Stockholders (shareholders) are the residual owners. They have voting rights to elect the Board of Directors. Their return comes in the form of dividends, which are not guaranteed and are paid out of net profits at the discretion of the management.
- Statement II explains the lender aspect of Statement I while Statement III explains the owner aspect of Statement I.
- Hence, both Statements II and III explain Statement I.

Q 64. Ans: (c)

Explanation:

- The Money Multiplier (m) indicates the total amount of money that the banking system generates with each unit of High-Powered Money (M_0). Mathematically, it is represented as:

$$m = \frac{1 + c}{c + r}$$

Where:

- c = Currency Deposit Ratio (CDR)
- r = Reserve Ratio (CRR + SLR)
- **Statement I is Correct:** CRR is the mandatory cash percentage banks must keep with the Central Bank. If CRR is decreased, banks have more "loanable funds." As these funds are lent out and redeposited, the credit creation process expands, thus increasing the money multiplier.
- **Statement II is Correct:** CDR represents the proportion of currency held by the public to their deposits in banks. If CDR is decreased, it means people are keeping

less cash in their pockets and depositing more in banks. More deposits mean banks can lend more, which directly increases the money multiplier.

- **Statement III is Correct:** SLR is the portion of deposits banks must maintain in liquid assets like gold or government securities. If SLR is decreased, it enables more assets for lending. Increased lending leads to higher money circulation and increases the money multiplier.

Q 65. Ans: (c)

Explanation:

- **Statement I is Correct:** Government capital expenditure (Capex), such as building roads, bridges, or power plants, is a direct component of aggregate demand. During a slowdown, government expenditure increases, which stimulates aggregate demand, helping to revive economic activity.
- **Statement II is Correct:** Capex has a high multiplier effect. When the government invests in infrastructure, it creates a demand for raw materials (steel, cement) and labor. This creates income for workers and profits for firms, who then spend that money, leading to further rounds of income and employment generation in the economy. This is the primary mechanism through which Capex stimulates growth.
- **Statement III is Incorrect:** While an increase in government spending can sometimes reduce private investment, this usually happens through "Crowding Out" via higher interest rates (due to increased government borrowing), not necessarily "higher taxation." Furthermore, during a slowdown, private investment is usually already low; government Capex often acts as a "Crowd-in" factor, improving infrastructure and making it more attractive for private firms to invest.

Q 66. Ans: (a)

Explanation:

- **Statement I is Correct:** Under the RBI Act, 1934, the RBI is the banker to the Central Government and most State Governments. It manages the government's cash balances, handles its receipts/payments, and acts as the Public Debt Manager, issuing government securities (G-Secs) to fund the fiscal deficit.
- **Statement II is Incorrect:** Fiscal policy (taxation, government spending, and borrowing) is determined by the Ministry of Finance, Government of India. The RBI is responsible for Monetary Policy (controlling money supply and inflation through interest rates).

Q 67. Ans: (c)

Explanation:

- **Statement I is Correct:** In Political Science and International Relations, deterrence is a strategy

intended to dissuade an adversary from undertaking an action (typically an attack) not yet started. It relies on the psychological effect of a threat of retaliation that outweighs any potential gain the adversary might achieve.

- **Statement 2 is Incorrect:** Deterrence is successful only as long as military force is not used. Once force is actually deployed to repel an attack, deterrence has failed, and the situation shifts to “Compellence” or “Defense.” Deterrence is about the threat of force, not the use of it.
- **Statement 3 is Correct:** For deterrence to work, the threat must be Credible (the adversary must believe you have the capability and the will to strike back). Furthermore, it depends on the Aggressor’s Motivation - if an adversary is highly motivated (e.g., fighting for survival), even a massive threat may fail to deter them.

Q 68. Ans: (b)

Explanation:

The “Three Seas” refer to the **Baltic, Adriatic, and Black Seas**. It currently consists of 13 European Union member states located along a North-South axis in Central and Eastern Europe (Austria, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia, and Greece). The primary goal is to bridge the “infrastructure gap” between the newer EU members in the East and the older members in the West. It focuses specifically on three pillars: Energy, Transport, and Digital infrastructure. It is not a military alliance (like NATO) or a separate trade bloc (since members are already part of the EU Single Market).

Q 69. Ans: (a)

Explanation:

- **Statement I is Correct:** A “deep” market implies high liquidity and a large number of buyers and sellers. When a robust corporate bond market exists, firms have an alternative source for financing.
- **Statement II is Correct:** Corporate bonds are debt instruments issued by companies directly to the public or institutional investors. Unlike bank loans, which are often subject to shorter-term floating rates and strict collateral requirements, bonds allow companies to lock in long-term fixed-rate funding for capital-intensive projects. By diversifying funding sources beyond the banking system, corporate bonds enable more efficient risk sharing, strengthen financial stability, and support productive sectors with stable, market-based capital. Statement II explains Statement I as a deeper bond market reduces dependence on bank credit because it offers a direct channel for companies to access long-term funds from non-bank investors. By providing this direct alternative for large-scale, long-term financing, the bond market effectively lessens the structural necessity for firms to seek credit from the banking sector.

Q 70. Ans: (b)

Explanation:

- **Statement I is Correct:** The Lokpal is a statutory body established under the Lokpal and Lokayuktas Act, 2013. It is not a Constitutional body as it was created by an Act of Parliament rather than an Article in the Constitution.
- **Statement II is Incorrect:** While the Lokpal has jurisdiction over the Prime Minister, it is not in all matters. According to Section 14 of the Act, the Lokpal cannot inquire into allegations against the Prime Minister relating to international relations, external and internal security, public order, atomic energy, and space. Any inquiry into other matters requires a full bench of the Lokpal and a two-thirds majority approval.
- **Statement III is Correct:** The Act stipulates that the Lokpal consists of a Chairperson and a maximum of eight members. Out of the total members (excluding the Chairperson), at least 50% must be from the SC, ST, OBC, minorities, and women categories. Additionally, 50% of the members must be judicial members.

Q 71. Ans: (b)

Explanation:

- **Option (a) is Incorrect:** This describes the general global trend of **accelerated glacier retreat** due to global warming. In fact, most Himalayan glaciers (especially in the eastern and central Himalayas) are retreating. However, the *Pamir-Karakoram Anomaly* refers to the opposite phenomenon — glacier stability or slight mass gain.
- **Option (b) is Correct:** The *Pamir-Karakoram Anomaly* refers to the observation that glaciers in the **Karakoram and Pamir ranges** have remained relatively stable or even shown slight mass gain, unlike most glaciers globally which are shrinking.
- Possible reasons include: 1. Dominance of **winter precipitation from Western Disturbances**, 2. Lower summer temperatures, 3. Extensive debris cover reducing melting. This makes the region an anomaly in the broader context of global glacier retreat.
- **Option (c) is Incorrect:** Although the Pamir-Karakoram region is tectonically active due to the **Indian-Eurasian plate collision**, the anomaly is **glaciological and climatic**, not tectonic. It does not refer to earthquake activity.
- **Option (d) is Incorrect:** The anomaly is not primarily about monsoonal precipitation patterns. In fact, the Karakoram region is more influenced by **Western Disturbances** than by the Indian monsoon. While precipitation patterns do play a role, the anomaly specifically concerns glacier mass balance, not rainfall irregularity.

Q 72. Ans: (a)

Explanation

- **Statement I is Correct:** The *Carbon Credit Trading Scheme* is indeed a **market-based framework** formulated under the Indian Carbon Market to regulate and facilitate the trading of carbon credits, helping to assign monetary value to GHG emissions.
- **Statement II is Incorrect:** CCTS is **not focused on energy intensity through Energy Saving Certificates (ESCerts)**; that was the objective of the earlier *Perform, Achieve and Trade (PAT)* scheme. CCTS instead targets **GHG emissions intensity reduction** via tradable Carbon Credit Certificates.

Q 73. Ans: (b)

Explanation

- **Statement I is incorrect.** The Airshed Approach emphasizes **regional and transboundary coordination**, not merely city-specific actions. It recognizes that isolated urban measures are insufficient when pollution sources and atmospheric movement span multiple jurisdictions.
- **Statement II is correct.** A key principle of the Airshed Approach is **policy synchronization across states and even international borders**, ensuring collective mitigation strategies such as coordinated emission standards and seasonal action plans.

Q 74. Ans: (c)

Explanation

- **Statement I is correct.** COP30 responded to growing climate urgency by adopting a wide range of measures aimed at accelerating implementation rather than merely reiterating commitments. The focus was on operational tools, financial support, and coordinated global action, reflecting an implementation-oriented phase of climate governance.
- **Statement II is correct and explains Statement I.** The launch of the Global Implementation Accelerator demonstrates a shift toward scalable and high-impact mitigation actions such as methane reduction, renewables expansion, and nature-based carbon removal. Additionally, the decision to triple adaptation finance directly addresses the needs of vulnerable populations disproportionately affected by climate change. These steps concretely illustrate how COP30 sought to accelerate implementation and strengthen cooperation.

- **Statement III is incorrect.** COP30 introduced several new initiatives beyond mitigation and adaptation finance. These included the **Belém Mechanism for Just Global Transition**, the **Technology Implementation Program (TIP)** to strengthen technology deployment in developing countries, and a new **Gender and Climate Action Plan** to enhance women's participation in climate action.

Q 75. Ans: (b)

Explanation:

- **Climate physical risks** refer to the **direct impacts of climate change on natural and human systems** arising from changes in weather patterns and climatic conditions. These risks affect infrastructure, agriculture, health, ecosystems, supply chains, and financial markets.
- They are broadly classified into: a) **Acute risks** – Event-driven and sudden (e.g., cyclones, floods, wildfires). b) **Chronic risks** – Long-term shifts in climate patterns (e.g., sea-level rise, sustained temperature increase, desertification).
- **Statement I is correct.** Acute physical risks stem from **extreme weather events** such as cyclones, floods, cloudbursts, and heatwaves. These events cause immediate destruction to property, infrastructure, crops, and human lives. For example, intense cyclones can damage ports, power grids, and industrial facilities, disrupting economic activity.
- **Statement II is correct.** Chronic physical risks develop gradually over time due to **long-term climate change trends**. Examples include rising sea levels threatening coastal cities, glacial melt affecting river systems, and persistent temperature rise reducing agricultural productivity. These risks reshape ecosystems and economic structures over decades.
- **Statement III is incorrect.** Physical risks are **not confined to coastal regions**. While coastal areas face sea-level rise and storm surges, inland regions face riverine floods, droughts, extreme heat, forest fires, and water stress. For instance, heatwaves in central India or droughts in sub-Saharan Africa demonstrate that inland geographies are equally vulnerable.

Q 76. Ans: (b)

Explanation

- **Row I is correctly matched.** Great Bear Lake is located in northwestern Canada, it is the largest lake entirely within Canada and is a freshwater lake.



- **Row II is correctly matched.** Lake Victoria is located in East Africa, shared by Kenya, Tanzania, and Uganda, it is the largest freshwater lake in Africa and one of the largest tropical lakes in the world.
- **Row III is not correctly matched.** Lake Kivu lies between Rwanda and the Democratic Republic of Congo. However, it is a freshwater lake, not saltwater. It is notable for dissolved methane and carbon dioxide gases.
- **Row IV is not correctly matched.** Great Slave Lake is located in Canada's Northwest Territories, it is a freshwater lake and one of the deepest lakes in North America.
- **Chetlat** lies in the northern part.
- **Kadmat** is situated south of Chetlat.
- **Kavaratti** lies further south and serves as the capital of Lakshadweep.
- **Minicoy** is the southernmost island of the group, located closest to the Maldives.

Q 77. Ans: (a)

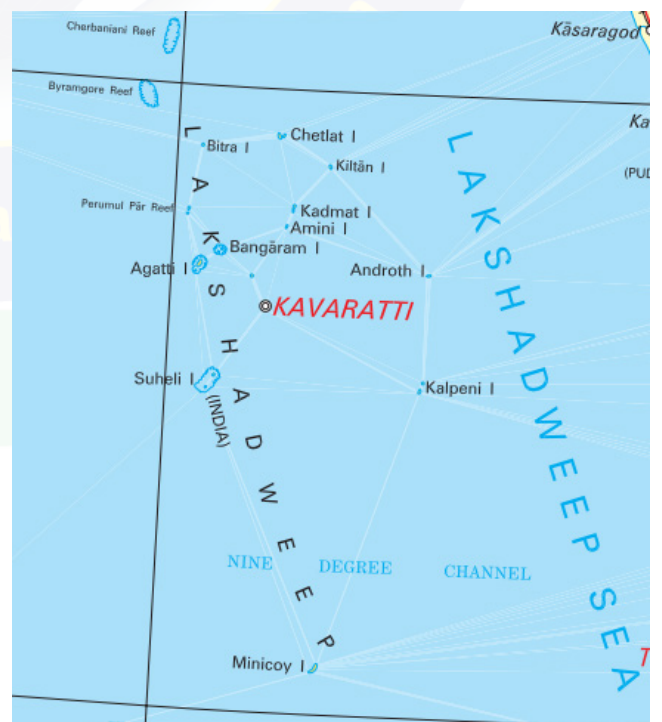
Explanation:

The North Indian Ocean has a distinctive circulation pattern because it is strongly influenced by monsoon winds. These seasonal winds reverse direction during different times of the year, leading to a corresponding seasonal change in surface currents. This makes its circulation pattern different from that of much of the Pacific and Atlantic Oceans, where currents do not reverse seasonally.

Q 78. Ans: (a)

Explanation:

- In the Lakshadweep island group, the islands are aligned roughly from north to south in the Arabian Sea.



Q 79. Ans: (a)

Explanation:

- **Statement I is Correct:** The Vindhya Range is a significant hill system in central India and has distinct geographical characteristics. The Vindhya Range extends from Gujarat in the west, passes through Madhya Pradesh, and reaches near the Ganga valley close to Varanasi in Uttar Pradesh.
- **Statement II is Incorrect:** The Vindhya Range is not a young folded mountain system. It was formed primarily through geological faulting. Due to its horizontal sandstone structure, it is generally flat-topped and plateau-like rather than consisting of sharp, recently formed peaks.

Q 80. Ans: (b)

Explanation:

- **Statement I is Correct:** The polar vortex is a large area of low pressure and extremely cold air that surrounds both the Arctic and Antarctic regions. It exists throughout the year. However, it strengthens during winter when temperature contrasts are higher and weakens during summer, but it does not disappear.
- **Statement II is Incorrect:** The polar vortex does not form only in winter. It is a permanent feature of the upper atmosphere near the poles. While it becomes stronger and more stable in winter, it continues to exist even during summer in a relatively weaker state.
- **Statement III is Incorrect:** The polar vortex is not a surface-level weather system. It exists high up in the atmosphere, tens of thousands of feet above the Earth's surface. Meteorologists study it using upper-atmospheric data. Although its expansion can influence surface weather, it is not directly located at ground level.
- **Statement IV is Correct:** During winter in the Northern Hemisphere, the polar vortex can expand, allowing cold Arctic air to move southward along the jet stream. This can lead to significant cold waves in regions that are usually not so cold, including parts of North America, Europe, and Asia.

Q 81. Ans: (a)

Explanation:

- **Statement I is Correct:** The Speaker can be removed from office by a resolution passed by a majority of all the then members of the Lok Sabha. This is known as an effective majority (i.e., a majority of the total membership excluding vacancies). The resolution must be passed by the Lok Sabha alone, as the Speaker is its presiding officer.
- **Statement II is Incorrect:** The Constitution mandates a minimum notice period of **14 days**, not 30 days, before a resolution for removal can be moved. This notice

requirement ensures that members have adequate time to consider the motion.

- **Statement III is Incorrect:** Article 93 of the Constitution of India deals with the **election** of the Speaker and Deputy Speaker of the Lok Sabha. The provisions relating to their resignation and removal are contained in **Article 94**, not Article 93.

Q 82. Ans: (b)

Explanation:

- Parliamentary control over the Executive is a fundamental feature of the parliamentary form of government in India. The Council of Ministers is collectively responsible to the Lok Sabha, and Parliament uses various tools to ensure accountability.
- **I is correct.** Question Hour is the first hour of a parliamentary sitting. During this time, Members of Parliament ask questions to ministers regarding their ministries' policies, decisions, and actions. Ministers are bound to respond, which ensures transparency and accountability. It is one of the most effective and regularly used instruments of parliamentary oversight.
- **II is correct.** Zero Hour begins immediately after Question Hour. Although it is not formally mentioned in the Rules of Procedure, it has evolved as an important parliamentary convention. Members can raise urgent matters of public importance without prior notice, compelling the government to respond. Thus, it acts as an informal yet significant control mechanism.
- **III is correct.** A No-Confidence Motion can be moved in the Lok Sabha to test whether the Council of Ministers enjoys the confidence of the majority. If passed, the government must resign. This is the strongest instrument of parliamentary control, as it can lead to the fall of the government.
- **IV is correct.** An Adjournment Motion is moved to discuss a definite matter of urgent public importance that requires immediate attention. Its admission interrupts the normal business of the House and may amount to censure of the government. It serves as a powerful tool to hold the Executive accountable for specific actions or failures.
- **V is incorrect.** Judicial Review is a power exercised by the Judiciary, not Parliament. It enables courts to examine the constitutional validity of laws and executive actions. Since it belongs to the judicial branch, it is not an instrument of parliamentary control.
- **VI is incorrect.** Cabinet Committees are internal bodies within the Executive that assist in decision-making and coordination of government policies. They function as part of the Executive machinery and are not mechanisms through which Parliament exercises control over the government.

Q 83. Ans: (a)**Explanation:**

- **Statement I is Correct:** The Constitution has intentionally given a weaker position to the State Legislative Council (Vidhan Parishad) in comparison to the Rajya Sabha. The Council has limited powers, especially in legislative matters, where the Legislative Assembly can override it.
- **Statement II is correct and explains Statement I:** The Rajya Sabha represents the States of the Indian Union and plays a key role in maintaining federal balance by protecting State interests against potential central overreach. This federal significance justifies its stronger constitutional status. In contrast, a State Legislative Council does not represent a federal unit in the same manner.
- **Statement III is also correct and explains Statement I:** The Legislative Council is heterogeneously constituted, representing various interests such as local bodies, teachers, graduates, and nominated members. This diverse and partly nominated composition weakens its authority and reduces its effectiveness as a strong revising chamber. On the other hand, the Rajya Sabha is largely composed of elected representatives of States (with only a limited number of nominated members), giving it greater legitimacy and authority.

Q 84. Ans: (b)**Explanation:**

- **Statement I is Incorrect:** While it is true that the India women's cricket team won their maiden World Cup title in 2025, they defeated South Africa in the final, not Australia.
- **Statement II is Correct:** As of the 2025 edition only four countries have won women's cricket world cup titles. Australia has won seven titles, England has won four championships, and New Zealand and India have each won the tournament once.

Q 85. Ans: (d)**Explanation**

- **Statement I is Incorrect:** Parliamentary Committees are **not appointed or elected by the Leader of the House**. They are appointed or elected by the House itself or nominated by the presiding officers such as the Speaker of the Lok Sabha or the Chairman of the Rajya Sabha.
- **Statement II is Incorrect:** Parliamentary Committees do **not function under the direction of the Prime Minister**. They work under the overall direction of the presiding officers of the Houses of Parliament.
- **Statement III is Incorrect:** Parliamentary Committees **do not submit their reports to the President**. Their reports are presented to the concerned House or to the presiding officer, who then places them before Parliament.

Q 86. Ans: (a)**Explanation:**

- The offices of the Speaker of the Lok Sabha and the Deputy Speaker are governed by constitutional provisions that clearly distinguish their modes of election and resignation.
- **Statement I is Correct:** After the constitution of a new Lok Sabha, the Speaker is elected "as soon as may be" on a date fixed by the President of India. This ensures that the House is properly constituted under constitutional authority. Once the Speaker is elected, the responsibility of fixing the date for the election of the Deputy Speaker rests with the Speaker.
- **Statement II is Incorrect:** The Constitution provides a specific and reciprocal method of resignation. The Speaker resigns by writing to the Deputy Speaker. Conversely, the Deputy Speaker resigns by writing to the Speaker. This arrangement preserves the internal autonomy of the House and avoids executive involvement..

Q 87. Ans: (c)**Explanation:**

- **Option a is Correct:** The Gaganyaan mission is designed to demonstrate India's capability to undertake human spaceflight missions. It proposes to send a crew of three astronauts to a Low Earth Orbit (LEO) at an altitude of about 400 km for a duration of approximately three days. After completing the mission objectives in orbit, the crew will safely re-enter the Earth's atmosphere and land in Indian sea waters. This reflects the core objective of the programme—demonstration of safe launch, orbiting, and recovery.
- **Option b is Correct:** The Human Rated LVM3 (HLVM3) is the human-rated configuration of ISRO's LVM3 heavy-lift launch vehicle. "Human rating" involves enhancing reliability, incorporating redundancy in critical systems, improving structural safety margins, and integrating a Crew Escape System (CES). These modifications ensure that the rocket meets stringent safety standards necessary for carrying astronauts, unlike standard satellite launch missions.
- **Option c is Incorrect:** Although LVM3 is indeed a three-stage launch vehicle, its configuration is not solid-liquid-solid. The actual configuration consists of a solid core stage (along with strap-on boosters), a liquid stage, and a cryogenic upper stage. The cryogenic stage uses super-cooled propellants and is crucial for placing the spacecraft into the intended orbit.
- **Option d is Correct:** Before undertaking the actual crewed mission, ISRO is conducting multiple precursor and unmanned missions such as the Integrated Air Drop Test (IADT), Pad Abort Test (PAT), and Test Vehicle (TV) flights. These missions are intended to validate critical technologies, demonstrate the effectiveness of

the Crew Escape System, and establish the overall safety and reliability of the launch vehicle and orbital module. Only after proving these systems through unmanned tests will the manned mission be attempted.

Q 88. Ans: (c)

Explanation:

- **Statement I is Correct:** At the India AI Impact Summit, the National Institute of Electronics & Information Technology (NIELIT), under the Ministry of Electronics & Information Technology (MeitY), Government of India, signed a Memorandum of Understanding (MoU) with the Government of Andhra Pradesh on 20th February, 2026 to establish India's first dedicated Quantum and Artificial Intelligence University campus in Amaravati. The initiative aims to strengthen India's research ecosystem in frontier technologies such as quantum computing, artificial intelligence, machine learning, and advanced electronics. It represents a strategic move to build high-end technical expertise, promote innovation, and support India's long-term technological self-reliance.
- **Statement II is Correct:** India's first semiconductor fabrication plant is being set up in Sanand, Gujarat, marking a major milestone in the country's semiconductor mission. Semiconductor fabrication units (fabs) are critical for manufacturing integrated circuits and microchips used in electronics, automobiles, telecommunications, and defense sectors. Establishing such a facility enhances domestic manufacturing capability, reduces import dependence, and supports India's ambition to become a global electronics manufacturing hub.

Q 89. Ans: (c)

Explanation

- **Option a is Incorrect:** It describes a **Geostationary Orbit (GEO)**, where a satellite orbits Earth at about 35,786 km above the equator and appears fixed over one point on Earth's surface. It is used mainly for communications and weather satellites. It is not a heliocentric orbit because the satellite revolves around Earth, not the Sun.
- **Option b is Incorrect:** This refers to a **Low Earth Orbit (LEO)**, typically between about 180 km and 2,000 km above Earth. Satellites in LEO orbit the Earth with short orbital periods (around 90 minutes). A heliocentric orbit is not Earth-centered.
- **Option c is correct:** A **Heliocentric Orbit** is one in which a spacecraft orbits the Sun rather than the Earth. Such orbits are commonly used for interplanetary missions and solar observation missions. After escaping Earth's gravitational influence, the spacecraft follows an orbit around the Sun.
- **Option d is Incorrect:** This describes a **Geostationary Transfer Orbit (GTO)**, which is a highly elliptical Earth

orbit used to transfer a satellite from LEO to GEO. It is an intermediate Earth-centered orbit and not related to orbiting the Sun.

Q 90. Ans: (b)

Explanation:

- The policy of "Blood and Iron" is associated with **Ghiyas ud din Balban**. During his reign, the law and order situation around Delhi and in the Ganga-Yamuna Doab had seriously deteriorated. Roads were unsafe due to robbers and dacoits, communication with eastern regions had become difficult, and several Rajput zamindars had constructed forts and defied the Sultan's authority. The Mewatis near Delhi had become so bold that they plundered areas close to the capital.
- **Itutmish** consolidated the Sultanate but did not follow such a harsh militaristic doctrine. **Alauddin Khalji** implemented strict economic and military reforms but is not specifically associated with the "Blood and Iron". **Muhammad bin Tughlaq** is known more for his ambitious but often impractical administrative experiments rather than a policy of ruthless military consolidation.

Q 91. Ans: (b)

Explanation:

- **Statement I is Correct:** The Amara-Nayaka system was a distinctive political arrangement of the Vijayanagara Empire. Under this system, the raya (king) assigned territories known as *amaram* to military commanders called amara-nayakas. These commanders were not hereditary rulers initially but functioned under royal authority. Their position was primarily military in nature, and they governed the assigned territories on behalf of the king. This arrangement helped the empire expand and maintain control over vast regions of the southern peninsula.
- **Statement II is Correct:** The amara-nayakas had the right to collect taxes and other dues from peasants, craftsmen, and traders within their assigned territories. They retained a portion of this revenue for personal use and, more importantly, for maintaining a stipulated contingent of horses, elephants, and soldiers. These military contingents were crucial because they formed an effective fighting force that the Vijayanagara rulers could mobilise during wars. Additionally, part of the revenue was also used for maintaining temples and irrigation works, reflecting their administrative responsibilities beyond purely military functions.
- **Statement III is Incorrect:** Amara-nayakas did not send the entire revenue to the royal treasury. Instead, they kept a substantial portion of the revenue to maintain their troops and manage local administration. Only a fixed tribute was sent annually to the king, and

they were also required to appear personally in the royal court with gifts as a mark of loyalty. Therefore, the system allowed them a degree of financial autonomy, even though they remained subordinate to the central authority.

Q 92. Ans: (b)

Explanation:

- **Row I is Correct:** Al-Biruni was a Central Asian scholar (from the Khwarezm region in present-day Uzbekistan). His famous work *Kitab-ul-Hind* is a systematic and critical study of Indian religion, philosophy, geography and social customs during the 11th century. It is valued for its comparative and scientific approach.
- **Row II is Correct:** Ibn Battuta was a Moroccan traveller who visited India in the 14th century and served in the court of Muhammad bin Tughlaq. His travel account, known as the *Rihla*, provides detailed insights into administration, urban life, trade networks and the Sultanate period.
- **Row III is Incorrect:** François Bernier was a French physician and traveller, not Portuguese. His work “*Travels in the Mughal Empire*” offers observations on Mughal politics, economy, land revenue system and the reign of Aurangzeb, and is an important European account of 17th-century India.

Q 93. Ans: (b)

Explanation:

- **Option a is Incorrect:** The Alvars were Vaishnava poet-saints of Tamil Nadu devoted to Vishnu. Their devotional hymns were composed in Tamil and compiled in the *Divya Prabandham*. They were not associated with Shiva worship, the worshipping of the linga, or the specific social reforms provided in the description.
- **Option b is Correct:** The movement led by Basavanna in twelfth-century Karnataka. His followers, known as Virashaivas or Lingayats, worshipped Shiva in the form of a personal linga worn on the body. They rejected caste hierarchy, questioned the idea of rebirth, opposed Brahmanical funerary rites like cremation, and encouraged social reforms such as widow remarriage and post-puberty marriage. Their teachings were expressed through vachanas composed in Kannada.
- **Option c is Incorrect:** The Nathpanthis were a Shaiva-oriented ascetic tradition associated with yogic practices and figures like Gorakhnath. While they emphasised renunciation and mystical discipline, they were not linked to Basavanna, vachana literature in Kannada, or the organised Lingayat social reform movement.
- **Option d is Incorrect:** The Mahanubhava sect emerged in Maharashtra and was devoted primarily to Krishna and other incarnations. It had distinct

theological doctrines and literary traditions but was not connected with linga worship, the Virashaiva ideology, or the specific reforms associated with Basavanna’s movement.

Q 94. Ans: (c)

Explanation:

- **Statement I is Correct:** The peshwa was the senior-most minister and supervised the general administration of the kingdom. He also held the state seal, which was used to authenticate royal orders and official documents. In later years, the office of the peshwa became the most powerful position in the Maratha state.
- **Statement II is Incorrect:** The sumanta was not responsible for finance; he handled foreign affairs and diplomatic correspondence with other states. Revenue and financial matters were managed by the amatya (mazumdar) and the pant sachiv.
- **Statement III is Correct:** The mantri was in charge of intelligence gathering and maintaining police records. He kept the ruler informed about internal conditions, conspiracies, and administrative developments. This function was essential for maintaining internal security and stability.
- **Statement IV is Correct:** The nyayadhisha functioned as the chief judicial authority of the kingdom. The pandit rao supervised religious affairs and charitable grants, ensuring conformity with dharma. Both positions were primarily civil posts and generally did not involve military command.

The Eight Ashtapradhans and Their Functions:

1. **Peshwa (Mukhya Pradhan)** – Head of general administration; held the state seal.
2. **Amatya (Mazumdar)** – In charge of finance and accounts.
3. **Pant Sachiv (Sachiv)** – Managed official correspondence and state records.
4. **Mantri** – Supervised intelligence, espionage, and police matters.
5. **Sumanta (Dabir)** – Looked after foreign affairs and diplomatic relations.
6. **Senapati** – Commander-in-chief of the army.
7. **Nyayadhisha** – Chief justice; administered civil and criminal justice.
8. **Pandit Rao** – Head of religious affairs and charitable grants.

Q 95. Ans: (b)

Explanation:

- **Option a is Incorrect:** This describes a traditional “long position,” where investors purchase shares with the expectation that their price will increase over time.

Profit is earned when the security is sold at a higher price than the purchase price.

- **Option b is Correct:** Short selling is a trading strategy in financial markets where an investor anticipates that the price of a stock or other security will fall. The investor borrows the security from a broker and immediately sells it at the current market price. If the price later declines as expected, the investor buys it back at the lower price and returns it to the lender, profiting from the difference (minus fees and interest).
 - ✓ This strategy is often used for speculative purposes. However, institutional investors and portfolio managers may also use short selling as a hedge to offset potential losses in their long positions. Since potential losses in short selling can be unlimited (if prices rise sharply), it is considered a high-risk strategy.
- **Option c is Incorrect:** This refers to government disinvestment, where the government sells its stake in public sector enterprises to raise revenue or improve efficiency. It is a fiscal policy measure and unrelated to market trading strategies like short selling.
- **Option d is Incorrect:** This refers to off-market share transfers between promoters or large shareholders. Such transfers do not involve borrowing securities or speculating on price declines, and therefore are not connected to short selling.

Q 96. Ans: (c)

Explanation:

- **Statement I is Correct:** Both ETFs and Mutual Funds pool funds from numerous investors and invest in a diversified basket of securities. They are managed by professional fund managers who aim to achieve the investment objective of the fund.
- **Statement II is Correct:** ETFs and Index Funds (a type of mutual fund) typically follow a passive investment strategy. They invest in securities in proportion to a benchmark index with the aim of replicating its returns at lower cost.

Q 97. Ans: (c)

Explanation:

- The **Index of Eight Core Industries (ICI)** is a monthly index that measures the performance of eight key infrastructure industries of the Indian economy—**Coal, Crude Oil, Natural Gas, Petroleum Refinery Products, Fertilizers, Steel, Cement, and Electricity**. Released by the Office of Economic Adviser, it serves as a leading indicator of industrial growth because these industries are fundamental inputs for other sectors. Together, they account for **40.27% weight** in the Index of Industrial Production, making the ICI an important barometer of overall industrial activity.

- **Statement I is correct.** The ICI currently uses **2011–12 as its base year (2011–12 = 100)**. The base year is periodically revised to reflect structural changes in the economy and to ensure more accurate measurement of growth trends.
- **Statement II is correct.** The combined weight of the eight core industries in the IIP is **40.27%**, which is slightly above 40%. This significant share makes the ICI a leading indicator for the broader industrial sector. A rise or fall in core industries strongly influences the overall IIP numbers.
- **Statement III is correct.** Among all eight industries, **Petroleum Refinery Products carry the highest weight (28.04%)** in the ICI. Because of this large weight, even small changes in refinery output can substantially impact the overall core sector growth rate.
 - ✓ The **Eight Core Industries** arranged in **decreasing order of weight (Base: 2011–12)** are: **Petroleum Refinery Products – 28.04% > Electricity – 19.85% > Steel – 17.92% > Coal – 10.33% > Crude Oil – 8.98% > Natural Gas – 6.88% > Cement – 5.37% > Fertilizers – 2.63%**

Q 98. Ans: (b)

Explanation

- The **Viksit Bharat – Guarantee for Rozgar and Ajeevika Mission (Gramin) Act, 2025** replaces the Mahatma Gandhi National Rural Employment Guarantee Act, 2005 (MGNREGA). While retaining the core principle of a statutory employment guarantee, it introduces reforms in funding architecture, planning integration, technology use, and administrative capacity to align rural employment with long-term infrastructure creation and the vision of *Viksit Bharat @2047*.
- **Statement I is Correct:** Section 5(1) provides a **statutory guarantee of not less than 125 days of wage employment** per rural household in each financial year. This enhances the earlier 100-day entitlement under MGNREGA, strengthening livelihood security and income stability.
- **Statement II is Incorrect:** The Act does **not dilute the right to demand employment**. Instead, it reinforces the enforceability of this right by maintaining the obligation to provide employment or pay unemployment allowance if work is not provided within the stipulated period.
- **Statement III is Correct:** The Act provides that the scheme will be implemented as a **Centrally Sponsored Scheme**, with a defined cost-sharing pattern between Centre and States (60:40; 90:10 for North Eastern and Himalayan States; 100% for Union Territories without legislatures).

Q 99. Ans: (b)

Explanation:

- The **Resilience and Sustainability Facility (RSF)** is a lending instrument introduced by the International Monetary Fund in 2022. It aims to provide long-term concessional financing to vulnerable and low-income countries to address structural challenges such as **climate change, pandemic preparedness**, and other sustainability-related risks that affect macroeconomic stability.
- The RSF complements traditional IMF emergency lending tools like the **Rapid Financing Instrument (RFI)** and **Rapid Credit Facility (RCF)**, but differs in that it focuses on **long-term resilience-building reforms** rather than short-term balance of payments support.

Q 100. Ans: (b)

Explanation

- **Option (a) is incorrect. Californium is not a rare earth mineral.** Rare earth elements belong to the

lanthanide series (like neodymium, lanthanum, cerium). Californium is a **synthetic actinide element**, not naturally occurring in usable quantities, and is not used in semiconductor fabrication.

- **Option (b) is correct. Californium (Atomic number 98)** is a highly radioactive synthetic element. Its isotope **Californium-252 (Cf-252)** is a powerful neutron emitter.
- It is used in: Nuclear reactor start-up, Neutron activation analysis, Cancer radiotherapy, Detection of explosives and mineral exploration. Because of its radioactive nature and high cost, it often appears in news related to **illegal possession or nuclear security concerns**.
- **Option (c) is incorrect.** Lithium-bearing minerals include **spodumene, lepidolite, and petalite**. Californium has no role in battery manufacturing or the EV supply chain.
- **Option (d) is Incorrect.** Metallurgical (coking) coal is a carbon-rich fossil fuel used in steelmaking. Californium is a **radioactive metallic element**, unrelated to coal or steel production processes.

