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ALL INDIA MOCK TEST – I

GENERAL STUDIES - PAPER - I EXPLANATION

INDEX

1. With reference to the "Nai Talim" education system, which was conceived by Mahatma Gandhi, which one of the following statements is ***incorrect***?
   (a) It was popularly described as education through handicrafts.
   (b) Religious doctrines were integral to this education system.
   (c) It emphasised holistic training of mind and body along with academics.
   (d) Education under this system was imparted through the medium of the provincial language.

EXPLANATION:

In Gandhi's view, education should be an integrated approach to the full development of the personality; it should include physical training and high moral principles along with intellectual and cognitive development.

- He conceived his **Nai Talim** or basic education for all in 1937.
- **Nai Talim** aimed to impart education that would lead to freedom from ignorance, illiteracy, superstition, the psyche of servitude, and many more taboos that inhibited the free thinking of a free India.
- This scheme of education was to emphasise **holistic training of mind and body**, **so along with academics**, there was to be purposeful manual labour. **So, Option (c) is correct.**
- Handicrafts, art and drawing were the most fundamental teaching tools in Nai Talim. **So, Option (a) is correct.**
- As Gandhi wanted to make Indian villages self-sufficient units, he emphasised vocational education, which increases the efficiency of students in undertaking tasks in those villages and makes the village a self-sufficient unit.
- The system was formalised at the **1937 Wardha Educational Conference**, where Gandhi outlined a scheme for free and compulsory education for children aged 7 to 14, structured around a central craft such as spinning, agriculture, or weaving, through which subjects like mathematics, science, and language would be **taught via practical application in the mother tongue.**
- Instruction in the mother tongue was mandated to facilitate deeper understanding and cultural preservation, rejecting English as the medium to avoid alienating rural learners. **So, Option (d) is correct.**

Thus, Gandhi conceived Nai Talim as a **secular and universal education system**, founded on ethical and social values rather than on religious doctrines. **So, Option (b) is not correct.**

2. Consider the following statements regarding the Ghadar movement:
   1. The revolutionaries in the Ghadar movement were mainly peasants.
   2. It was headquartered in Vancouver.
   3. The Ghadar programme was to bring about a coordinated revolt in British India.
   4. It followed a secular approach in preaching militant nationalism.

   Which of the statements given above is/are correct?
   (a) 1, 2 and 3 only
   (b) 2, 3 and 4 only
   (c) 1, 3 and 4 only
   (d) 4 only

EXPLANATION:

The First World War broke out in 1914, and to many Indian nationalists, it appeared that a once-in-a-lifetime opportunity had arrived to take advantage of Britain's difficulty. Being embroiled in the war, it was felt, Britain would not be in a position to effectively answer a nationalist challenge.

- The challenge was thrown by two very different groups of nationalists, the Ghadar revolutionaries based in North America, and the Home Rule Leagues of Tilak and Annie Besant in India.

- The Ghadar revolutionaries were recruited largely from the ranks of Punjabi immigrants who had settled on the West Coast of North America at least since 1904.
- They were **mostly debt-ridden and land-hungry peasants** from the crowded areas of Punjab, especially Jullundur and Hoshiarpur, many of whom had served in the British Indian Army and had thus acquired the confidence and the means necessary for emigration. **So, Statement 1 is correct.**

- Lala Har Dayal assumed leadership of the immigrant Indian community and, in May 1913, the need for a central organisation was met with the setting up of the Hindi Association in Portland, which later changed its name to Hindustan Ghadar Party.
- Baba Sohan Singh Bhakna was elected the President, Lala Har Dayal the General Secretary and Pandit Kanshi Ram Maroli the Treasurer at the first meeting of the Association, which was also attended by others. A sum of $10,000 was collected on the spot. Decisions were taken to set up a headquarters by the name of **Yugantar Ashram in San Francisco** and start a weekly paper, the Ghadar, for free circulation. **So, Statement 2 is not correct.**

The **Ghadrites intended to bring about a revolt in India**. Their plans were encouraged by two events in 1914—the Komagata Maru incident and the outbreak of the First World War.

- They urged fighters to go to India. Kartar Singh Saraba and Raghubar Dayal Gupta, Rashbehari Bose and Sachin Sanyal were asked to lead the movement.
- Political dacoities were committed to raise funds. The Punjab political dacoities of January–February 1915 had a somewhat new social content. In at least 3 out of the 5 main cases, the raiders targeted the moneylenders and the debt records before decamping with the cash. Thus, an explosive situation was created in Punjab.
- The Ghadrites fixed 21st February, 1915, as the date for an armed revolt in Ferozepur, Lahore, and Rawalpindi garrisons.
- The plan was foiled at the last moment due to treachery. The authorities took immediate action, aided by the Defence of India Rules, 1915. Rebellious regiments were disbanded, leaders arrested and deported, and 45 of them hanged.
- Rashbehari Bose fled to Japan (from where he and Abani Mukherji made many efforts to send arms), while Sachin Sanyal was transported for life.

Therefore, the Ghadar programme was to bring about a coordinated revolt in British India. **So, Statement 3 is correct.**

The most important achievement of the Ghadar movement was that, despite the fact that the vast majority of their followers were recruited from amongst Punjabi Sikh immigrants, they never betrayed any communal tendencies and were, on the contrary, **strongly secular in their outlook**.
Conceit with religion was seen as petty and narrow-minded, and unworthy of revolutionaries. Thus, the Ghadar movement followed a secular approach in preaching militant nationalism. **So, Statement 4 is correct.**

3. Consider the following statements regarding the character feature of Mesolithic Paintings:
   1. Themes of the paintings are larger in size
   2. Predominance of Community dancing scenes
   3. No usage of ornamentation by humans
   4. Humans are drawn in a naturalistic manner, while animals are drawn in a stylish manner

   Which of the above given statements are ***not*** correct?
   (a) 1, 2 and 3 only
   (b) 2, 3 and 4 only
   (c) 1, 2, 3 and 4
   (d) None of the above

EXPLANATION:

Mesolithic paintings (roughly 10,000–5,000 BC) reflect a shift toward human-centric scenes, depicting hunting, dancing, and daily life in a stylised, dynamic manner rather than purely realistic animal depictions.

These paintings, often found on cliff faces or rock shelters using red/white pigments, show increased, smaller-scale social activity.

Size and Themes of Paintings:

- During this period, the themes are multiple, but the paintings are smaller in size. **So, Statement 1 is not correct.**
- Depicting hunting, dancing, and daily life, showing increased social activity.

Human Appearance and Ornamentation

- The hunters are shown wearing simple clothes and ornaments.
- Sometimes, men have been adorned with elaborate head-dresses, and sometimes painted with masks also. **So, Statement 3 is not correct.**

Artistic Style (Humans vs Animals)

- There are also a few engravings representing mainly animals.
- Though animals were painted in a naturalistic style, humans were depicted only in a stylistic manner. **So, Statement 4 is not correct.**

Hunting

- Hunting scenes predominate.
- The hunting scenes depict people hunting in groups, armed with barbed spears, pointed sticks, arrows, and bows.
- In some paintings, these primitive men are shown with traps and snares, probably to catch animals. **So, Statement 2 is not correct**

Social Life Depictions:

- Women are painted both in the nude and clothed.
- The young and the old equally find a place in these paintings.
- Children are painted running, jumping, and playing.
- Community dances provide a common theme.
- There are paintings of people gathering fruit or honey from trees, and of women grinding and preparing food.
- Some of the pictures of men, women, and children seem to depict a sort of family life.
- In many of the rock shelters, we find handprints, fist prints, and dots made by the fingertips.

Depiction of Animals:

- Elephant, bison, tiger, boar, deer, antelope, leopard, panther, rhinoceros, fish, frog, lizard, squirrel, and, at times, birds are also depicted.
- The Mesolithic artists loved to paint animals.
- In some pictures, animals are chasing men.
- In others, they are being chased and hunted by men.
- Some of the animal paintings, especially in the hunting scenes, show a fear of animals, but many others show a feeling of tenderness and love for them.

Paintings and Colours used:

- The artists of Bhimbetka used many colours, including various shades of white, yellow, orange, red ochre, purple, brown, green, and black.
- But white and red were their favourite colours.
- The paints were made by grinding various rocks and minerals.
- They got red from haematite (known as geru in India).
- The green came from a green variety of a stone called chalcedony.
- White might have been.

4. With reference to the stupa in ancient India, consider the following pairs:

Sl. No	***Stupa***	***Dynasty***	***Description***
1.	Barhut Stupa	Mauryan	A notable southern gateway with an inscription of Satavahana King Satakarni
2.	Piprahwa Stupa	Sunga	The oldest stupa built of bricks in India
3.	Amaravati Stupa	Ikshavahus	Made of White Marble

How many of the above given pairs is/are correctly matched?
(a) Only one
(b) Only two
(c) All three
(d) None

EXPLANATION:

The Barhut Stupa is located in Madhya Pradesh, India, near the city of Satna. It was built in the 2nd century BCE, **during the reign of the Sunga dynasty,** which ruled over central and northern India after the Mauryan Empire.

Patronage and Contributions:

- The Bharhut Stupa was commissioned by **King Dhanabhuti**, who was a devout Buddhist and a generous donor.
- He also invited other laypeople, monks, and nuns to contribute to the construction and decoration of the stupa.
- The names and donations of the patrons are inscribed on the stones and pillars of the stupa, along with their wishes and blessings.

Misattributed Feature (Sanchi Stupa):

- The most impressive feature of Sanchi Stupa (not Bharhut Stupa), its magnificent gateways, was constructed during the Satavahana rule.
- The southern gateway, having an inscription of the Satavahana King Satakarni (specifically Satakarni II), is present in the Great Stupa at Sanchi (not Bharhut stupa), located in the Raisen district of Madhya Pradesh, India.
- An inscription on the southern gateway records that it was the gift of Ananda, the son of Vasithi, the chief of the artisans of King Sri-Satakarni.
- Sri-Satakarni is identified with the Satavahana king Satakarni II, who ruled in the 1st century BCE.
- Many Buddhist rock-cut temples, like the early group (Hinayana) of Ajanta Caves, were carved during the Satavahana period. **So, Row 1 is not correct.**

The Piprahwa Stupa is regarded as the **oldest stupa built of bricks in India** and is located in Uttar Pradesh. It was constructed in multiple phases.

- The earliest phase dates back to the time of the Buddha's death and consisted of a mud-built structure by the Sakyas.
- The second phase, from the early Mauryan period, introduced the use of well-fired mud bricks, laid in concentric circles, marking the transition to brick construction.
- The stupa underwent further modifications in later phases, including during the Sunga period, when its structure was expanded and modified.
- Thus, while the Piprahwa Stupa is indeed one of the earliest brick stupas in India, it was not originally built during the Sunga dynasty, as its brick phase began in the Mauryan period. **So, Row 2 is not correct.**

The Amaravati Stupa, also known as the Maha Stupa or Amaravati Mahachaitya, is one of the most remarkable achievements of ancient Indian Buddhist architecture and sculpture.

- It is located in the present-day Palnadu district of Andhra Pradesh.

- Built and embellished over several centuries, from approximately 200 BCE to 250 CE, **primarily during the Satavahana period**, the stupa served as a major centre of Buddhist worship and pilgrimage.
- The Amaravati Stupa was **constructed primarily using limestone**, with finely carved sculptural panels often described as "white marble" due to their appearance (though technically limestone).
- The dome (Anda) was likely built using brick and faced with limestone slabs, following the traditional stupa construction method.
- The railings (vedika), gateways (torana), and pillar casings featured elaborate carved limestone reliefs and free-standing sculptures. **So, Row 3 is not correct.**

5. Consider the following statements with reference to the Ahom kingdom:
   1. It was founded by Chaolung Sukaphaa.
   2. Assam was ceded to British India after the Treaty of Yandabo.
   3. Forced labour was prevalent in the Ahom kingdom.

   Which of the statements given above are correct?
   (a) 1 and 2 only
   (b) 2 and 3 only
   (c) 1 and 3 only
   (d) 1, 2 and 3

EXPLANATION:

The Ahom dynasty was **established by Chaolung Sukaphaa**, a Shan prince of Mong Mao (present-day Myanmar/Yunnan), who came to Assam after crossing the Patkai Mountains. **So, Statement 1 is correct.**

- It is between the 13th and 19th centuries that several tribal communities also came into the historical forefront of Assam. Kacharis, Chutias and Koch were the prominent tribal groups that were found in the medieval times of Assam.
- The rule of this dynasty ended with the Burmese invasion of Assam and the subsequent **annexation by the British East India Company following the Treaty of Yandaboo** in 1826. The British emperor took charge of the state and thus began the colonial era of Assam. **So, Statement 2 is correct.**

Forced labour was an important element of the Ahom Kingdom (1228–1826) in Assam, organised under a system known as the **Paik system. So, Statement 3 is correct.**

- The Paik system, also referred to as the Khel System, was a structured framework where every adult male within the kingdom, aged between 16 and 50, was enrolled as a Paik to serve the state.
- Beyond military obligations to the State, Paiks also had duties to fulfil for their masters.
- Paiks were broadly classified into two categories - Kanri and Chamua.
  - **Kanri Paiks** were regular peasants obligated to serve as soldiers during wartime and as labourers during peacetime.
  - On the other hand, **Chamua Paiks**, often of higher birth or relative affluence, could avoid personal state service by paying a commutation fee of Rs. 3 per head per annum, known as Ga-dhan. Efficiency in the Paik or Khel system was ensured through strict supervision.
- The **Moamoria Uprising**, a series of peasant rebellions against Ahom rule, erupted in 1769 during the reign of King Lakshmi Singha (1769–1780), driven by grievances over heavy taxation, **forced labour under the paik system**, and religious discrimination against the Moamoria sect—a Vaishnavite group comprising lower-caste Morans, Mataks, and other communities excluded from Ahom aristocratic privileges.

6. With reference to the advent of the Portuguese in India, which of the following statements is/are correct?
   1. The Portuguese established their first factory at Cochin.
   2. The permit system for ships was introduced by Francisco De Almeida.
   3. Afonso de Albuquerque abolished the practice of the Sati system in Goa.
   4. The Portuguese Governor Nino da Cunha shifted the capital from Cochin to Goa.

   Select the correct answer using the code given below:
   (a) 1 and 2 only
   (b) 2, 3 and 4 only
   (c) 3 and 4 only
   (d) 1, 3 and 4 only

EXPLANATION:

In 1497, under the Treaty of Tordesillas (1494), the rulers of Portugal and Spain divided the non-Christian world between them by an imaginary line in the Atlantic, some 1,300 miles west of the Cape Verde Islands. Under the treaty, Portugal could claim and occupy everything to the East of the line, while Spain could claim everything to the West. The situation was thus prepared for the Portuguese incursions into the waters around India.

- The Portuguese presence in India began with Vasco da Gama's arrival at Calicut on the Malabar Coast in May 1498, establishing the first direct maritime link between Europe and India for trade in spices and other commodities.
- In 1500, Pedro Álvares Cabral established the initial Portuguese trading factory (feitoria) in Calicut, though it was soon destroyed amid conflicts with local Muslim merchants opposed to European intrusion.
- Vasco da Gama's second voyage in 1502 led to the **creation of a more secure factory in Cochin**, leveraging alliances with local rulers against the Zamorin of Calicut. By 1503, the Portuguese had fortified Cochin with their first permanent stronghold in India, marking the shift from mere trading posts to defended enclaves.

Thus, the Portuguese established their first factory in Cochin. **So, Statement 1 is correct.**

Albuquerque, who succeeded Almeida as the Portuguese governor in India, was the real founder of the Portuguese power in the East, a task he completed before his death.

- He secured for Portugal the strategic control of the Indian Ocean by establishing bases overlooking all the entrances to the sea. There were Portuguese strongholds in East Africa, off the Red Sea, at Ormuz; in Malabar, and at Malacca.
- The Portuguese, under Albuquerque, bolstered their stranglehold by **introducing a permit system for ships called the cartaz permit system and exercising control over the major ship-building centres** in the region. The nonavailability of timber in the Gulf and Red Sea regions for ship-building also helped the Portuguese in their objectives. **So, Statement 2 is not correct.**
- Albuquerque acquired Goa from the Sultan of Bijapur in 1510 with ease; the principal port of the Sultan of Bijapur became "the first bit of Indian territory to be under the Europeans since the time of Alexander the Great". An interesting feature of his rule was the abolition of sati. **So, Statement 3 is correct.**

In 1530, **Nuno da Cunha**, governor of Portuguese India from 1529 to 1538, transferred the administrative **capital of the Estado da Índia from Cochin to Goa**, marking a permanent shift that endured until 1961. **So, Statement 4 is correct.**

- Cochin had served as the headquarters since 1505, valued for its deep-water harbour and role in early spice trade dominance, but its southern location proved increasingly peripheral to Portuguese military and commercial priorities on the Konkan coast.
- Goa, initially captured by Afonso de Albuquerque in 1510 and briefly used as a base before reverting to Cochin, offered superior strategic advantages, including a naturally defensible estuary,

proximity to Arabian Sea shipping lanes, and thriving trade in horses imported from Persia for Deccan sultans.

- The decision reflected Cunha's emphasis on consolidating Portuguese holdings amid escalating conflicts with the Gujarat Sultanate and Vijayanagara Empire, positioning Goa as a forward base for naval operations and fortifications like those at nearby Bassein.
- This relocation centralised governance over the growing network of forts and factories, enhancing administrative efficiency and revenue collection from duties on intra-Asian trade, which by the 1530s included textiles, pepper, and slaves.

7. With reference to Tulsidas, consider the following statements:
   1. He was a contemporary of the Mughal King Akbar.
   2. His work, Ramcharitmanas, is included in the UNESCO Representative List of the Intangible Cultural Heritage of Humanity.
   3. He also authored Vinaya Patrika and Krishna Gitavali.

   How many of the above statements is/are correct?
   (a) Only one
   (b) Only two
   (c) All three
   (d) None

EXPLANATION:

Tulsidas (1532-1623 CE) was a contemporary of Nabhadas and lived during the reigns of the Mughal Emperors Akbar (1556–1605) and Jahangir. **So, Statement 1 is correct.**

- Tulsidas's **Ramcharitmanas** was included in UNESCO's Memory of the World Asia-Pacific Regional Register in 2024 (not the Representative List of the Intangible Cultural Heritage of Humanity).
- It is recognised as a significant documentary heritage manuscript alongside the Panchatantra and Sahṛdayāloka-Locana. **So, Statement 2 is not correct.**

Ramcharitmanas was written by the 16th-century Bhakti poet Goswami Tulsidas.

- He also authored several other works, including **Vinaya Patrika**, Gitavali, Dohavali and Kavitavali. His minor works include Baravai Ramayana, Janaki Mangal, Ramalala Nahachhu, Ramajna Prashna, Parvati Mangal, **Krishna Gitavali**, Hanuman Bahuka, Sankata Mochana and Vairagya Sandipini.
- Furthermore, he is the seer of the **Hanuman Chalisa**, a powerful and popular mantra for Hanuman, in 40 verses. **So, Statement 3 is correct.**

8. With reference to Sikhism, consider the following statements:
   1. Guru Nanak did not accept the theory of incarnation.
   2. Guru Tegh Bahadur was a contemporary of Mughal ruler Aurangzeb.
   3. Guru Gobind Singh introduced the concept of Langar.

   How many of the above given statements is/are correct?
   (a) Only one
   (b) Only two
   (c) All three
   (d) None

EXPLANATION:

Reincarnation is widely accepted as a reality of the afterlife amongst large sections of Sikhs.

- The concept, however, stands critiqued and rejected within Gurbani.
- The preclusion of reincarnation from the Sikhi of Guru Nanak becomes apparent once the notion of redefining pre-1469 concepts is considered.

- Guru Nanak deployed virtually all religious concepts in existence in the pre-1469 belief systems because they were ingrained within the religious canvas of his era and widely accepted by humanity then. Guru Nanak went beyond critiquing these concepts and beliefs. He redefined them to fit his spiritual canvas.

Guru Nanak did not approve of the theory of the incarnation of God, for the human body was prey to decay and death, whereas God was beyond them. **So, Statement 1 is correct.**

Guru Tegh Bahadur was an Indian spiritual leader who is revered as the **ninth Sikh Guru** (1664–75).

- He is the second Sikh martyr executed by the Mughal rulers.
- He was also the father of the 10th Guru, Guru Gobind Singh.
- Guru Tegh Bahadur led the Sikhs through a period of political turmoil and growing religious intolerance.
- He is remembered particularly for his fight for religious freedom.
- He contributed 116 verses to the Adi Granth (the sacred scripture of Sikhism).
- **Guru Tegh Bahadur lived during the rule of Mughal emperor Aurangzeb**.

The Mughal Empire, at its peak of military power under emperor Aurangzeb, imposed religious and political pressures, threatening the still-evolving Sikhism. **So, Statement 2 is correct.**

Guru Nanak laid as much emphasis on equality among all and fraternity as the highest principles of living.

Instead of seeking to isolate, as did meditation or other austerities, Guru Nanak emphasised a path in which *Naam Simran* holds equal sanctity in both communal life and individual practice.

- Farther than this, in his concepts of Dharmashala, a form of 'Sangat' - commune and Pangat or Langar, a form of community kitchen for all to dine together without discrimination, he not only underlined the need for a strong community life but also of personal goodness, sociability, harmony and equality among all.
- The **institution of Langar** (community kitchen) was **introduced earlier by Guru Nanak and further developed by later Gurus**, especially Guru Amar Das. Thus, Guru Gobind Singh did not introduce it. **So, Statement 3 is not correct.**

9. With reference to emerging battery technologies, consider the following statements:
   1. Sodium-ion batteries generally possess a lower energy density than Lithium-ion batteries but offer better safety against thermal runaway.
   2. Lithium-polymer (Li-Po) batteries can be designed in flexible shapes and sizes compared to Lithium-ion (Li-ion) batteries.
   3. Lithium-ion batteries can use copper current collectors at the anode, while Sodium-ion batteries can use aluminium current collectors at both the anode and cathode.
   4. Sodium-ion batteries are considered safer for long-distance transport because they can be completely discharged to 0% without degrading the battery's chemistry.

   How many of the above given statements is/are correct?
   (a) Only one
   (b) Only two
   (c) Only three
   (d) **All four**

EXPLANATION:

A lithium-ion or Li-Ion battery:

- It is a type of rechargeable battery are made up of the following parts: a negative electrode or anode from which the electrons are released and a positive electrode or cathode that receives them.
- **Lithium ion batteries** is their potential for thermal runaway, which can lead to massive heat in a short time, fires and explosions.

Sodium-ion batteries:

- They are a type of rechargeable battery that work in a similar way to lithium batteries, but carry the charge using sodium ions (Na+) instead of lithium ions (Li+).
- Sodium is a silvery, soft alkaline metal that is very abundant in nature - it can be found, for example, in sea salt or in the earth's crust.
- **Sodium-ion batteries** typically **operate at a lower voltage than lithium-ion batteries** due to the electrochemical properties of sodium.
- The lower voltage reduces the overall energy output of the battery, contributing to its lower energy density.
- **Sodium ion batteries, have a lower risk of thermal runaway** because sodium is less reactive with air and moisture. **So, Statement 1 is correct.**
- Unlike lithium-ion batteries, which must be transported on their own with a maximum 30% state of charge by air, manufacturers claim sodium-ion batteries can be safely transported at a 0% charge.

Thus, Sodium-ion batteries can be discharged to 0% without significant degradation, unlike lithium-ion. This makes them safer for storage and transportation. **So, Statement 4 is correct.**

Lithium-polymer (LiPo) batteries are a type of lithium-ion battery technology that uses polymer electrolytes.

- This differs from standard lithium-ion batteries, which use a solvent-based electrolyte.
- Polymer electrolytes used are highly ionically conductive and form lithium-ion conduction channels.
- Polymer electrolytes were first used in dye-sensitised solar cells, but now are being investigated for use in batteries, fuel cells and more.
- **Lithium-polymer batteries are more flexible in terms of shape and size** compared to lithium-ion batteries.

This versatility allows them to fit into unconventional spaces and find use in devices with unique form factors. **So, Statement 2 is correct.**

Lithium-ion batteries use copper as the anode current collector because aluminium alloys with lithium at low potentials, degrading performance.

- In contrast, sodium does not alloy with aluminium at room temperature, allowing sodium-ion batteries to use aluminium as the anode current collector (and aluminium is already used on the cathode side).
  - Lithium-ion batteries typically use copper (anode) and aluminium (cathode).
  - Sodium-ion batteries can use aluminium for both electrodes (since sodium does not alloy with aluminium like lithium does).
- This reduces costs, improves material availability, and contributes to safer transport. **So, Statement 3 is correct.**

10. Consider the following:
    1. PSLV has sent the greatest number of customer satellites than any other launch vehicle of India.
    2. PSLV does not have Cryogenic Engines
    3. PSLV is the only Indian launch vehicle that has launched spacecraft to both the Moon and Mars
    4. Monomethylhydrazine (MMH) and Unsymmetrical dimethylhydrazine (UDMH) are the fuels used in Vikas Engines of PSLV.

    How many of the above statements is/are correct?
    (a) Only one
    (b) Only two
    (c) Only three
    (d) **All four**

EXPLANATION:

ISRO has been providing Launch services for customer satellites since 1999 on board ISRO's Polar Satellite Vehicle (PSLV).

- The Polar Satellite Launch Vehicle (PSLV) is ISRO's primary workhorse for launching customer satellites.
- PSLV earned its title 'the workhorse of ISRO' through consistently delivering various satellites into low Earth orbits, particularly the IRS Series of satellites.
- Having carried over 400 foreign satellite customers from thirty-four countries.
- PSLV is a versatile vehicle, capable of launching satellites into LEO, SSO, Sub-GTO, GTO Orbits.
- Its most notable achievement was the PSLV-C37 mission in 2017, which successfully placed 104 satellites in orbit in a single launch, setting a world record.

Thus, the Polar Satellite Launch Vehicle (PSLV) has launched the highest number of customer satellites by a significant margin compared to any other launch vehicle of India. **So, Statement 1 is correct.**

The PSLV **does not have a cryogenic engine** and can only put small satellites, weighing just over one tonne, into geosynchronous orbit. Cryogenic engines are used in ISRO's GSLV and LVM3 rockets. **So, Statement 2 is correct.**

- A cryogenic engine, which uses liquid oxygen at -253 degrees Celsius and liquid hydrogen at -183 degrees Celsius, can develop the thrust needed in the final state of the rocket to put satellites, weighing two tonnes or more, into a geosynchronous orbit.
- Mastering this technology is essential for any space power as launching heavier satellites requires cryogenic engines even in the lower stages of the rocket.
- Only five others have cryogenic technology: the US, Russia, Europe, China, and Japan.

In addition to launching satellites into LEO, PSLV has also launched satellites for communication, meteorology, navigation, scientific experiments, and space exploration missions.

- The PSLV successfully launched two spacecraft- Chandrayaan-1 in 2008 and Mars Orbiter Spacecraft in 2013, which later travelled to the Moon and Mars, respectively. It also launched India's first space observatory, Astrosat.
- India's heavy-lift rocket, LVM3 (formerly GSLV Mk III), has since launched Chandrayaan-2 and Chandrayaan-3 to the Moon.

The Polar Satellite Launch Vehicle (PSLV) is the only Indian launch vehicle to launch spacecraft to both the Moon and Mars. **So, Statement 3 is correct.**

India's Polar Satellite Launch Vehicle is a four-stage rocket that uses a variety of propellants.

- **Stage One** (PS1): It uses hydroxyl-terminated polybutadiene (HTPB) propellant, using an S139 solid rocket motor.
- **Stage Two** (PS2): It uses **unsymmetrical dimethylhydrazine (UDMH)** as fuel and Dinitrogen tetroxide N_2O_4 as an oxidiser. The Vikas engine on this stage was developed by the Liquid Propulsions Systems Centre.
- **Stage Three** (PS3): It uses HTPB solid propellant, similar to the first stage, and features an S-7 engine.
- **Stage Four** (PS4): This is a liquid-fueled stage, using **monomethylhydrazine (MMH)** as fuel and mixed oxides of nitrogen (MON) as the oxidiser.

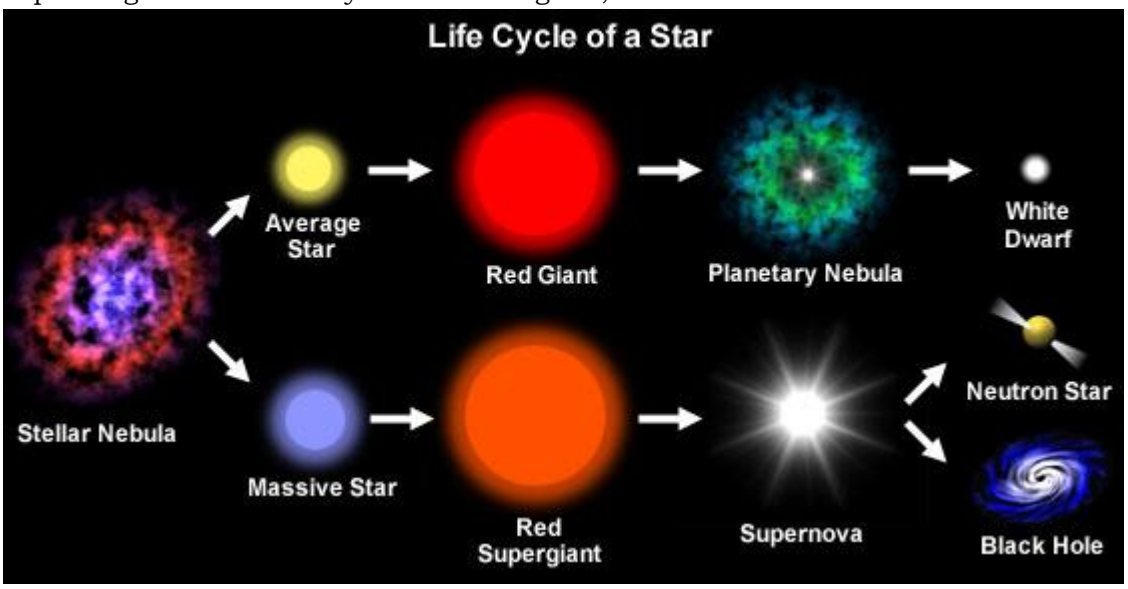
So, Statement 4 is correct.

11. The sun is 4.6 billion years old now. Which one of the following will the sun become in another 4.6 billion years?
    (a) White Dwarf
    (b) **Red Giant**
    (c) Red Super Giant
    (d) Neutron Star

EXPLANATION:

The Sun formed about 4.6 billion years ago from a giant, spinning cloud of gas and dust called the solar nebula.

- As the nebula collapsed under its own gravity, it spun faster and flattened into a disk.
- Most of the material was pulled toward the center to form the Sun, which accounts for about 99.8% of the solar system's mass, while the remaining material formed the planets and other celestial bodies.
- Like all stars, the Sun will eventually run out of energy. In about 5 billion years, it will enter the red giant phase, expanding significantly and engulfing the inner planets, including Earth. **So, Option (b) is correct.**
  - As hydrogen in the core gets depleted, nuclear fusion slows, causing the core to contract and heat up.
  - This triggers helium fusion, producing heavier elements such as carbon and oxygen.
  - The increased heat causes the outer layers to expand, leading to the red giant phase.
  - During this phase, the Sun will lose its outer layers, eventually leaving behind a dense core.
- After spending about 1 billion years as a red giant, sun will become a white dwarf.



12. With reference to the drug "Nimesulide", recently in the news, consider the following statements:
    1. Nimesulide is a steroidal drug used for reducing inflammation
    2. The recent ban by the Union Health Ministry prohibits the manufacture and sale of all formulations of Nimesulide, including topical gels and sustained-release oral tablets.
    3. The Central Government exercises its power to prohibit such drugs in the interest of public health under the provisions of the Drugs and Cosmetics Act, 1940.

    How many of the above given statements is/are correct?

    (a) **Only one**
    (b) Only two
    (c) All three
    (d) None

EXPLANATION:

Nimesulide is a **non-steroidal anti-inflammatory drug** used for its pain-relieving, anti-inflammatory, and fever-reducing effects.

- It is a prescription medication primarily intended for short-term, second-line treatment (when other medicines have failed) due to concerns over potential liver toxicity. **So, Statement 1 is not correct.**

- The Central government, in exercise of the powers conferred by Section 26A of the Drugs and Cosmetics Act, 1940 and after consultation with the Drugs Technical Advisory Board, prohibits the manufacture, sale and distribution of the drug, with immediate effect.
- India has previously used Section 26A to ban several fixed-dose combinations and high-risk drugs to safeguard public health. **So, Statement 3 is correct.**

The Union Health Ministry has banned oral formulation of nimesulide above 100mg in immediate release form.

- Strengths below 100mg or strengths above 100mg in other types of release (such as sustained release, extended release) are not under this ban.
- Non-oral formulations like topical gels/creams or suppositories are also not banned.
- The Central government is satisfied that the use of all oral formulations containing Nimesulide above 100mg in immediate release dosage form is likely to involve risk to human beings and that safer alternatives to the said drug are available. **So, Statement 2 is not correct.**

13. Which of the following are examples of Artificial Intelligence-based models or applications?
    1. Veo
    2. Nano Banana
    3. Sora
    4. Midjourney

    Select the correct answer using the code given below:

    (a) 1 and 2 only
    (b) 1, 2 and 3 only
    (c) 3 and 4 only
    (d) **1, 2, 3 and 4**

EXPLANATION:

Artificial intelligence (AI) applications are software programs that use AI techniques to perform specific tasks, ranging from simple repetitive tasks to complex cognitive functions requiring human-like intelligence.

- **Google has launched Veo 3.1**, an upgrade to its generative AI video model that will allow users to create better AI-generated content.
- Veo 3.1 focuses on character and scene consistency:
  - It addresses the challenge of maintaining the same character or background across different clips.
  - The model offers improved identity consistency, allowing creators to keep a character's appearance consistent even as the setting or camera angle changes, along with better background and object consistency.

Thus, Veo is an AI-based video generation model (by Google DeepMind). **So, Statement 1 is correct.**

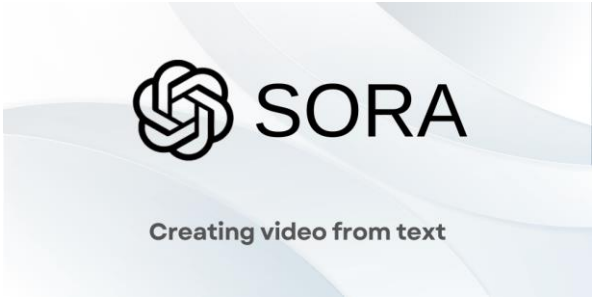
Nano Banana is Google's AI-powered image generation and editing tool, officially known as Gemini 2.5 Flash Image.

- Nano Banana is Google's AI-powered image generation and editing tool, officially known as Gemini 2.5 Flash Image.
- It is designed to create high-quality visuals with features like natural language processing, real-time editing, and multi-image blending. It can generate images from text prompts, edit existing images, and translate text within images.
  - The name "Nano Banana" came from a combination of the developer's nicknames and is used through the Google Gemini ecosystem for visual decoding and image generation.
  - Nano Banana 2 delivers more accurate visuals, faster performance, pro-level features (text rendering, translation, upscaling to 2K/4K), and sharper details with support for multiple aspect ratios.

  Thus, Nano Banana is Google's AI-based application. **So, Statement 2 is correct**.

Sora is OpenAI's latest AI model designed to generate high-fidelity videos from text descriptions, bringing AI-powered content creation to new heights.

- Unlike traditional video generation tools, Sora can produce complex, dynamic scenes with realistic motion, detailed environments, and consistent characters.
- This innovation is particularly significant for filmmakers, marketers, and digital creators looking for a fast, AI-assisted way to produce compelling visuals. **So, Statement 3 is correct.**



Midjourney AI is a generative artificial intelligence tool developed by an independent research lab to create images from text prompts.

- It is accessible through Discord, where users interact with the bot to generate images.
- It is known for producing high-quality, detailed images and is widely used by artists and designers.. **So, Statement 4 is correct.**

14. Consider the following statements:
    1. CAR-T therapy is a cell-based immunotherapy, while monoclonal antibodies are protein-based targeted therapy.
    2. CAR-T cells are genetically modified white blood cells.

    Which of the statements given above is/are correct?
    (a) 1 only
    (b) 2 only
    (c) Both 1 and 2
    (d) Neither 1 nor 2

EXPLANATION:

Chimeric antigen receptor (CAR) T-cell therapy:

- It is a type of cell-based immunotherapy for some types of blood cancer. It works by turning your T lymphocytes (T cells) into more efficient cancer-fighting machines.
- In CAR T-cell therapy, healthcare providers introduce a new gene into your T cells, enabling them to better detect and kill cancerous cells.

Monoclonal antibodies (mAbs) :

- They are treatments that target specific proteins and help your immune system fight disease.
- They can also reduce inflammation caused by your immune system. Healthcare providers use monoclonal antibodies to treat autoimmune diseases, cancer, neurological diseases, osteoporosis, infectious diseases, and more.

Thus, CAR-T therapy is a cell-based immunotherapy, while monoclonal antibodies are protein-based targeted therapy. **So, Statement 1 is correct.**

CAR-T therapy is a type of **immunotherapy made from a patient's own white blood cells**, which are **genetically modified to recognize and attack the patient's cancer cells**.

- CAR T-cell therapy (chimeric antigen receptor T-cell therapy) is an **example of cell-based gene therapy**.
- This treatment combines gene therapy and cell therapy, where cells are genetically altered to perform a specific function.
- In CAR T-cell therapy, a gene is introduced into a person's T cells, which are a type of immune cell.
- This gene provides instructions for making a protein called the chimeric antigen receptor (CAR), which attaches to cancer cells.
- The modified immune cells can specifically attack cancer cells. **So, Statement 2 is correct.**

15. With reference to the "India Semiconductor Mission (ISM)," recently in the news, consider the following statements:
    1. ISM 1.0 focused on establishing manufacturing capacity, while ISM 2.0's mission scope is to include indigenous semiconductor equipment, speciality chemicals, and gas supply chains.
    2. India has production capability for 3-nanometer (3 nm) semiconductors.
    3. ISM aims to transition from traditional Silicon substrates to Silicon Carbide (SiC) based semiconductors for high-power Electric Vehicles (EV) applications.
    4. The Design Linked Incentive (DLI) scheme offers financial support for the domestic design of Integrated Circuits (ICs) and System-on-Chips (SoCs) but specifically excludes the development of IP Cores.

    How many of the above given statements is/are correct?
    (a) Only one
    (b) Only two
    (c) Only three
    (d) All four

EXPLANATION:

The **India Semiconductor Mission (ISM)** launched in 2021 by the **Ministry of Electronics and Information Technology (MeitY)** aims to build a strong semiconductor and display ecosystem, positioning India as a global hub for electronics manufacturing and design.

India Semiconductor Mission 1.0 (ISM 1.0):

- Under ISM 1.0, the government aimed to build a domestic semiconductor and display manufacturing base by supporting semiconductor fabrication plants, display manufacturing, and packaging (ATMP) facilities.
- It provided fiscal support of up to 50% of project costs and addressed barriers related to land, utilities, and regulatory coordination.
- As a result, progress was mainly in downstream manufacturing, while manufacturing equipment, speciality chemicals, wafers, gases, and design technologies continued to be sourced from abroad.

India Semiconductor Mission 2.0 (ISM 2.0):

- With ISM 2.0 (Budget 2026), the approach broadens beyond manufacturing facilities.
- It seeks to promote domestic (indigenous) production of semiconductor equipment and components, along with critical inputs such as specialty chemicals, industrial gases, and wafers that are currently imported.
- It also aims to strengthen supply chains and connect manufacturing with research and industry-led training. **So, Statement 1 is correct.**

In May 2025, India inaugurated advanced 3-nanometer (3nm) chip design centres in Noida and Bengaluru, marking a major milestone, with manufacturing production capability for 3nm infrastructure chips aimed for by 2032.

Thus, India aims to manufacture 3-nanometer (3 nm) semiconductors by 2032, as it does not currently have this capability. **So, Statement 2 is not correct.**

India is making a generational shift towards becoming a future leader in the semiconductor field and is designing, packaging, and manufacturing Made in India chips.

- As the use of intelligent chips grows rapidly, India is refining packaging technologies to make them among the best in the world.
- In fabrication, **India is moving from traditional silicon-based semiconductors to the latest silicon carbide (SiC)–based semiconductors**, while in design the roadmap includes more advanced 3D glass packaging technology.
- **Silicon carbide (SiC)** is more stable and robust than silicon semiconductors, as it can withstand high temperatures (up to about 2400°C) and high voltage conditions.
- SiC-based semiconductors are optimising performance and enhancing driving ranges across electric vehicles.
- The **Advantages** of SiC in Electric Vehicle (EV) include:
  - **Higher Efficiency -** SiC devices exhibit lower switching losses and reduced conduction losses compared to silicon-based devices.
  - **Increased Power Density -** SiC's superior material properties, including higher breakdown voltage and thermal conductivity, enable the design of power electronics systems with higher densities.
  - **Enhanced Thermal Performance -** SiC's excellent thermal conductivity helps dissipate heat more effectively, reducing thermal resistance and allowing higher operating temperatures.
  - **Improved Power Conversion Efficiency -** SiC devices offer superior electrical properties, such as higher breakdown voltage and lower on-resistance, resulting in more efficient power conversion processes.
  - **Smaller Systems -** SiC's superior material properties, including higher breakdown voltage and thermal conductivity, enable designing smaller and lighter power electronic systems for electric vehicles. **So, Statement 3 is correct.**

The **Ministry of Electronics and Information Technology** has announced the Design Linked Incentive (DLI) Scheme to offset disabilities in the domestic semiconductor design industry, with the aim of moving up the value chain and strengthening the semiconductor chip design ecosystem in the country.

- The **Centre for Development of Advanced Computing (C-DAC)** is responsible for implementing the DLI Scheme as the **nodal agency**.
- The Design Linked Incentive Scheme aims to offer financial incentives as well as design infrastructure **support across various stages of development and deployment of semiconductor design(s) for Integrated Circuits (ICs), Chipsets, System on Chips (SoCs), Systems & IP Cores** and semiconductor-linked design(s) over a period of 5 years. **So, Statement 4 is not correct.**

16. Which of the following measures is most likely to be taken to control excess depreciation of the Indian Rupee?
    (a) Encouraging the purchase of final goods from abroad
    (b) Discouraging borrowing from abroad
    (c) Sale of foreign currency in the domestic market by the RBI
    (d) Restricting inward remittances

EXPLANATION:

Rupee depreciation means a **decrease in the value of the rupee** with respect to other currencies.

- Depreciation is generally an automatic process determined by market forces and not done deliberately by the Reserve Bank of India.
- It depends on the demand and supply of foreign exchange.
- For the past few years, the rupee has been depreciating against the US dollar.
- This means the US dollar is becoming more expensive in terms of INR.

RBI Measures to:

- The RBI can **sell forex reserves and buy Indian rupees**, increasing demand for the rupee.
- It can also take steps to increase the supply of foreign currency by **expanding market participation.** Thus, the sale of foreign currency in the domestic market helps in controlling excess depreciation of the Indian rupee. **So, Option (c) is correct.**
- The RBI can ease capital controls by increasing FII limits on investment in government securities.
- To attract NRI deposits, the RBI liberalizes deposit schemes, and banks may raise interest rates for overseas Indians.
- The RBI has exempted such deposits from Cash Reserve Ratio (CRR) and Statutory Liquidity Ratio (SLR) requirements.

Macroeconomic Consideration: Maintaining a competitive real exchange rate is important for boosting medium- and long-term economic growth and maintaining the balance of payments.

Government Measures: The government also plans to increase FDI in various sectors and reduce non-essential imports to manage external sector stress.

17. Consider the following statements regarding the Global Gender Gap Index:
    1. It is an annual publication of the United Nations Educational, Scientific and Cultural Organisation (UNESCO).
    2. The index benchmarks the current state and evolution of gender parity across different dimensions.
    3. The dimensions are Economic Participation and Opportunity, Educational Attainment, Health and Survival, and Political Empowerment.
    4. As per the collective speed of progress at present, it will take another 123 years to reach full gender parity globally.

How many of the statements given above is/are correct?
(a) Only one
(b) Only two
(c) Only three
(d) All four

EXPLANATION:

The Global Gender Gap Index has been published annually by the **World Economic Forum (WEF)** since 2006, (not by UNESCO).

- The Global Gender Gap index measures gender disparities across countries in four domains, namely, Economic Participation and Opportunity, Educational Attainment, Health and Survival, and Political Empowerment.
- It focuses on assessing gender-based gaps rather than absolute levels of development, ensuring that rankings are independent of a country's income or overall development status. **So, Statement 1 is not correct.**

The Global Gender Gap Index **benchmarks the current state and evolution of gender parity** across four key dimensions (subindexes):

- Economic Participation and Opportunity,
- Educational Attainment,
- Health and Survival, and
- Political Empowerment.

Since launching in 2006, it is the longest-standing index tracking the progress of numerous countries' efforts towards closing these gaps over time. **So, Statements 2 and 3 are correct.**

According to the Global Gender Gap Index, based on the **collective speed of progress of economies covered continuously since 2006**, it **will take 123 years to reach full gender parity globally**.

- Women outpace men in higher education, but only 28.8% reach senior leadership, representing a missed opportunity for greater economic resilience and growth amid global uncertainty.
- Political empowerment has seen the strongest gains, yet with only 22.9% of the global gap closed to date, it remains the biggest barrier to progress on parity worldwide. **So, Statement 4 is correct.**

18. In the context of the Budget of the government of India, identify which of the following is a capital expenditure:
(a) Grant given to a state government for asset creation
(b) Long-term loan given to a state government
(c) Recovery of a loan from a foreign government
(d) Expenditure towards the maintenance of border roads

EXPLANATION:

Capital Budget consists of capital receipts and capital payments.

Capital receipts:

- The capital receipts are loans raised by Government from public, called market loans, borrowings by Government from Reserve Bank and other parties through sale of Treasury Bills, loans received from foreign Governments and bodies, and recoveries of loans from State and Union Territory Governments and other parties. **So, Option (c) is not correct.**

Capital expenditure:

- Capital expenditure is the money spent by the government on the development of machinery, equipment, building, health facilities, education, etc.
- It also includes the expenditure incurred on acquiring fixed assets like land and investment by the government that gives profits or dividend in future.

- It is associated with investment or development spending, where expenditure has benefits extending years into the future.
- Capital expenditure includes:
  - Acquisition of assets like land, buildings, machinery, equipment, and investments in shares, etc.
  - Long-term loans and advances granted by the Central Government to States, Union Territories, government companies, corporations, and other parties. **So, Option (b) is correct.**

Example: Under the **scheme for Special Assistance to States for Capital Investment**, states are provided 50-year interest-free loans for capital expenditure. Between 2020-21 and 2025-26 (till August 11, 2025), states have received central assistance worth Rs 4,01,276 crore under this scheme. During this period, capital spending from states' own revenues has remained flat, while the increase in capital expenditure is being supported by the scheme.

Revenue Budget consists of revenue receipts (tax and non-tax) and revenue expenditure.

- Tax revenues include proceeds from taxes and duties levied by the Union.
- Other receipts include interest, dividends, fees, and receipts for services rendered by the Government.

Revenue expenditure:

- Revenue expenditure is incurred for the normal functioning of government departments, interest payments, subsidies, etc.
- It does not result in the creation of assets.
- Expenditure on maintenance of border roads does not create assets; hence, it is revenue expenditure. **So, Option (d) is not correct.**
- Grants to States/UTs and other parties are treated as revenue expenditure, even if used for asset creation. **So, Option (a) is not correct.**

19. Consider the following statements:
    1. Lending at flexible interest rates protects banks from the negative effects of excessive inflation.
    2. Accepting deposits at fixed interest rates allows banks to gain from excessive inflation.

    Which of the statements given above is/are correct?
    (a) 1 only
    (b) 2 only
    (c) Both 1 and 2
    (d) Neither 1 nor 2

EXPLANATION:

A **floating interest rate (flexible interest rates)** fluctuates with market conditions, unlike a fixed (or unchanging) interest rate.

- Credit cards and some mortgage loans come with floating interest rates.
- Floating interest rates reflect the market by following an index or tracking another benchmark interest rate.
- Floating rates can increase a borrower's financial risk versus fixed rates since the monthly payment and interest cost can change.
  - **For example**, if someone takes out a fixed-rate mortgage with a 4% interest rate, the individual will pay that rate for the lifetime of the loan, and the payments will be the same throughout the loan term.
- In contrast, if a borrower takes out a mortgage with a variable rate, it may start with a 4% rate and then adjust, either up or down, changing the monthly payments over the life of the loan.
- For the Banks, Lending at flexible interest rates protects it from the negative effects of excessive inflation by allowing interest income to rise alongside market rates.

Thus, lending at flexible interest rates protects banks from the negative effects of excessive inflation. **So, Statement 1 is correct.**

Banks benefit when they earn higher returns on loans and investments compared to the interest they pay on deposits. A larger spread between interest earned and interest paid improves bank profitability.

- Accepting deposits at fixed interest rates allows banks to gain from excessive inflation, as the real value of the amount repaid to depositors declines.
- At the same time, if interest rates on loans and investments increase, banks earn higher returns while their cost of deposits remains fixed.

Thus, fixed-rate deposits combined with rising returns during inflation improve banks' margins. **So, Statement 2 is correct.**

20. With reference to a deep tech startup, consider the following statements:
    1. It is an enterprise that is less than 10 years old.
    2. It has a turnover not exceeding ₹200 crore.
    3. It is engaged in the development of novel intellectual property.
    4. It has obtained certification from the Ministry of Corporate Affairs.

    How many of the above statements is/are correct?

    (a) Only one
    (b) Only two
    (c) Only three
    (d) All four

EXPLANATION:

Deep-tech startups are characterised by their focus on solutions based on advanced scientific or engineering knowledge, substantial R&D investments, unique intellectual property, and challenges such as lengthy development periods and high capital needs, according to the Department for Promotion of Industry and Internal Trade (DPIIT), notification.

- Recently, Deep-tech startups have been officially recognised by the Government, allowing a **20-year operation period and a ₹300-crore turnover limit**. The move aims to foster innovation in advanced technology and engineering solutions.
- The Ministry of Commerce and Industry has broadened the definition of startups under the Startup India programme to include deep technology firms, creating a new category.
- According to a notification by the Department for Promotion of Industry and Internal Trade (DPIIT), a deep-tech startup is an entity that can operate for **up to 20 years** from the date of registration and has a **turnover limit of ₹300 crore. So, Statements 1 and 2 are not correct.**

As per the notification by the DPIIT, the **deep-tech must spend most of its money** on research and development (R&D) activities; owns or is **in the process of creating significant novel intellectual property (IP)** and taking steps to commercialise the same; faces extended development timelines, long gestation periods, high capital and infrastructure requirements, and carries large technical or scientific uncertainty. **So, Statement 3 is correct.**

To be counted as a deep tech startup, companies must apply to the **Department for Promotion of Industry and Internal Trade (DPIIT), which functions under the Ministry of Commerce and Industry,** for a certificate. **So, Statement 4 is not correct.**

- The DPIIT is the final authority that determines whether a company qualifies as a startup or a deep tech startup.
- It will decide this based on "guidance" from an Inter-Ministerial Board of Certification, which includes a Joint Secretary, DPIIT (Convener); a representative from the Department of Science and Technology (DST); a representative from the Department of Biotechnology, according to the notification.

21. Which one of the following statements best describes the term 'Tax Collected at Source'?
    (a) It is a tax imposed by the government on sellers after the completion of sales transactions.
    (b) It is a tax collected by an employer from an employee's salary before payment.
    (c) It is a tax imposed on the profit earned by sellers from the sale of goods.
    (d) It is a tax collected by the seller from the buyer at the point of purchase.

EXPLANATION:

TCS stands for Tax Collected at Source. TCS refers to the tax payable by a seller, which he collects from the buyer at the time of the sale of goods. Section 206C of the Income-Tax Act of 1961 governs provisions related to TCS.

- Tax Collected at Source (TCS) is a tax collection mechanism in India that requires the seller or collector to collect a certain percentage of the transaction value from the buyer at the time of sale. The collected tax is then remitted to the Government. TCS applies to various goods and services, and it aims to ensure tax compliance by collecting tax at the source of income.
- The Income Tax Department mandates TCS to be collected at specified rates on certain transactions, which may include the sale of goods, the sale of immovable property, or the provision of specific services. This mechanism helps in preventing tax evasion and ensuring that the Government receives its due tax revenue.

Collect TCS:

- The seller should collect tax from the buyer in addition to the value of the goods/services.
- A buyer is a person who purchases specific goods. He/she is liable to pay the TCS amount along with the bill amount in applicable cases. **So, Option (d) is correct.**

Example of TCS Calculation:

If a buyer purchases a car from a showroom valued at Rs. 11 lakh, then the showroom must collect and deposit Rs. 11,000 as the TCS. So, the total amount to be collected from the buyer is Rs. 11,11,000 (Rs. 11,00,000 + Rs. 11,000).

→ Tax after completion of sales → The tax is collected from the buyer by the seller, and it happens at the time of sale (point of purchase), not afterwards. **So, Option (a) is not correct.**

→ Employer collecting tax from salary → Tax Deducted at Source (TDS). **So, Option (b) is not correct.**

→ Tax on profits → A capital gains tax. **So, Option (c) is not correct.**

22. Consider the following statements regarding money supply:
    Statement 1:
    An increase in term deposits into the banking system increases the money supply.
    Statement 2:
    Term deposits contribute more to money multiplication because of the increased capability of banks to lend.
    Select the correct answer using the codes given below:
    (a) Only Statement 1 is correct
    (b) Only Statement 2 is correct
    (c) Both Statements 1 and 2 are correct, but neither explains the other
    (d) Both Statements 1 and 2 are correct, and one explains the other

EXPLANATION:

Term deposits are deposits where customers agree not to withdraw their money for a fixed period in return for a higher rate of interest. These deposits typically offer higher interest rates than savings accounts (Demand Deposit), where funds can be withdrawn at any time.

Lending Capacity and Stability of Funds

- When customers deposit money in banks, the banks use these funds to lend to other consumers or businesses while paying interest to depositors.
- However, in the case of deposits that can be withdrawn at any time, banks face uncertainty regarding how much they can lend.
- Term deposits reduce this uncertainty by locking in funds for a fixed period, thereby providing greater stability and predictability.
- This enables banks to lend more confidently and extensively.

Money Multiplication:

- With increased stability of funds through term deposits, banks are able to expand their lending activities.
- This leads to greater credit creation in the economy, thereby increasing money supply through the process of money multiplication. Thus, **both statements 1 and 2 are correct, and statement 2 explains statement 1.**

23. With reference to the development of 'Champion MSMEs' as mentioned in the Union Budget, consider the following statements:
    1. It aims to establish 'Corporate Mitras' in Tier-I towns to assist MSMEs in meeting compliance requirements.
    2. It targets enhancing liquidity support through the Trade Receivables Discounting System.
    3. It provides the creation of an SME Growth Fund to promote high-performing enterprises.

    How many of the above statements is/are correct?

    (a) Only one
    (b) Only two
    (c) All three
    (d) None

EXPLANATION:

The Union Budget 2026-27 proposed a three-pronged approach to help Indian Micro, Small & Medium Enterprises (MSMEs) grow as Champions by providing equity, liquidity and professional support to MSMEs.

- The MSME Champions Scheme aims to identify and nurture select enterprises by upgrading their processes, minimising inefficiencies, improving competitiveness, and supporting their growth to achieve excellence in both domestic and international markets.
- As per the final approach, the Government will facilitate Professional Institutions such as ICAI, ICSI, ICMAI to design short-term, modular courses and practical tools to develop a cadre of '***Corporate Mitras***', especially in ***Tier-II and Tier-III towns***.
- These accredited para-professionals will help MSMEs meet compliance requirements at affordable costs. **So, Statement 1 is not correct.**

Trade Receivables Discounting System (TReDS), a digital platform introduced in 2014 and later updated in 2018, enables MSMEs to auction their trade receivables to financiers, helping them unlock liquidity against unpaid invoices.

- The Union Budget 2026-27 prioritises developing "Champion MSMEs" through a three-pronged strategy of equity, liquidity, and professional support.
- To enhance liquidity, the Government is mandating TReDS as the settlement platform for all Central Public Sector Enterprises (CPSEs) purchases, introducing CGTMSE-backed credit guarantees for invoice discounting, and allowing TReDS receivables to be securitised. **So, Statement 2 is correct.**

- The Union Budget 2026-27 introduced a Rs 10,000-cr **SME growth fund** to create MSME champions. The proposed Rs 10,000-crore SME Growth Fund will offer equity support to high-

potential enterprises, incentivising MSMEs based on select performance criteria to help them scale up and expand.

- The finance minister also announced a Rs 2,000-crore infusion into the Self-Reliant India Fund, strengthening the fund-of-funds mechanism that supports MSMEs through equity participation. **So, Statement 3 is correct.**

24. Consider the following:
    1. Corporate bonds
    2. Dated government securities
    3. Shares
    4. Bills of Exchange

    Which among the above are considered capital market instruments?
    (a) 1 and 2 only
    (b) 2 and 3 only
    (c) 1, 2 and 3 only
    (d) 1, 2, 3 and 4

EXPLANATION:

Capital market refers to the market where capital is raised for long-term deployment in business. It includes equity, debt, and hybrid instruments issued by businesses and agencies.

Capital market instruments:

- They are financial securities used to raise **long-term funds**, such as stocks, bonds, and derivatives.
- They play a key role in resource allocation, risk management, and price discovery, and their performance reflects overall economic health.
- These instruments ensure the flow of funds in the economy by transferring surplus funds from investors to those requiring capital, thereby promoting investment and economic growth.

Structure of Capital Market: The capital market has two parts:

- **Primary market:** Securities are issued for the first time (e.g., IPO).
- **Secondary market:** Trading of already issued securities takes place.

The following are the major Capital Market Instruments:

Stocks (Equity Shares)

- Issued by companies to raise capital.

- Provide ownership and voting rights.
- Returns come in the form of dividends and capital appreciation.
- High risk but potentially higher returns. **So, Statement 3 is correct.**

Preference Shares

- Get priority in dividend payment and liquidation.
- Do not carry voting rights.
- Types include redeemable and convertible shares.

Debt Instruments

- Issued by governments and companies for raising funds.
- Do not provide ownership rights.
- Have fixed tenure and interest payments.
- Include government and corporate bonds/debentures. **So, Statement 1 is correct.**
- Generally, less risky than equity.
- **Dated Government Securities**: Dated Government Securities, commonly referred to as Government Bonds, have longer maturities, ranging from 5 to 40 years. These bonds pay a fixed or floating interest rate, typically every six months, until maturity, at which point the principal is returned to the investor. These securities are suitable for long-term investors seeking regular income. **So, Statement 2 is correct.**

Derivatives

- Derive value from underlying assets like stocks, bonds, or commodities.
- Used for hedging, speculation, and arbitrage.
- More volatile and risky.
- Common types: futures and options.

Exchange-Traded Funds (ETFs)

- Pool funds to invest in assets like equity, bonds, or gold.
- Combine features of shares and mutual funds.

Foreign Exchange Instruments

- Traded in forex markets.
- Include currency futures, swaps, and options.

A **Bill of Exchange** is a **money market instrument**. It is a legal financial instrument widely used in trade, especially in international transactions, to guarantee payment between parties. **So, Statement 4 is not correct.**

- **Corporate bonds** → Long-term debt instruments → Capital market
- **Dated government securities** → Long-term government bonds → Capital market
- **Shares (equities)** → Ownership instruments with no maturity → Capital market
- **Bills of Exchange** → Short-term instrument (used in trade finance) → Money market

25. With reference to the constitutional scheme governing the relationship between Union laws and State executive powers, consider the following statements:
    1. A State can exercise its executive power only in areas where the Constitution or Parliament has not given that power exclusively to the Union.
    2. The Union Government can issue directions to a State even in matters falling under the State List, if it is necessary to ensure compliance with laws made by Parliament.
    3. A State's failure to comply with such directions may be treated as a situation justifying constitutional action against the State.
    4. The executive power of the Union extends to giving directions to States only in matters enumerated in the Union List.

Which of the statements given above are correct?

(a) 1, 2 and 3 only

(b) 1 and 4 only

(c) 2, 3 and 4 only

(d) 1, 2, 3 and 4

EXPLANATION:

The executive power has been divided between the Centre and the States on the lines of the distribution of legislative powers, except in a few cases.

- The **executive power of the Centre** extends to the whole of India:
  - to matters on which Parliament has exclusive power of legislation (Union List), and
  - to the exercise of rights, authority, and jurisdiction conferred by treaties or agreements.
- Similarly, **the executive power of a State** extends to its territory in respect of matters on which the State Legislature has exclusive power of legislation (State List), **as per Article 162.**
- Further, as clarified by **Article 162**, **in matters where both Parliament and State Legislatures can make laws (Concurrent List), the executive power of the State still exists,** but it is subject to and limited by the executive power expressly conferred on the Union by the Constitution or by any law made by Parliament.
- Therefore, in respect of Concurrent List subjects, the executive power generally rests with the States, and laws made by Parliament are usually executed by the States, unless the Constitution or Parliament provides otherwise.
- On the other hand, the **State can exercise executive power in all matters within its legislative domain except where such power is exclusively vested in the Union** by the Constitution or by a law made by Parliament. **So, Statement 1 is correct.**

Article 256 imposes a general obligation on the States to so exercise their executive power as to ensure compliance with the laws made by Parliament, and the executive power of the Centre extends to the giving of such directions to a State as may appear to the Centre to be necessary for the purpose. This makes the State executive subservient to the Union executive power.

- Thus, under **Article 256**, the Union can issue directions to States **to ensure compliance with laws made by Parliament**, even if those laws operate in areas that may otherwise fall in the State List. **So, Statement 2 is correct.**

According to **Article 257** of the Indian Constitution: Control of the Union over States in certain cases:

- The executive power of every State shall be exercised in such a way that it does not impede or prejudice the exercise of the executive power of the Union.
- The **executive power of the Union extends to giving directions to a State as may appear necessary to the Government of India** for this purpose.
- The executive power of the Union also extends to giving directions to a State regarding the construction and maintenance of means of communication declared to be of national or military importance.
  - Provided that nothing in this clause shall be taken as restricting the power of Parliament to declare highways or waterways to be national highways or national waterways or the power of the Union with respect to the highways or waterways so declared or the power of the Union to construct and maintain means of communication as part of its functions with respect to naval, military and air force works.

The Union's executive power is not limited only to Union List matters: Under Articles 256 and 257, the Union can issue directions to States even in State List matters for:

- Ensuring compliance with parliamentary laws
- Protecting Union interests

So, Statement 4 is not correct.

Article 365 of the Constitution of India states that if a State fails to comply with, or give effect to, directions issued by the Union in the exercise of its executive power under any provision of the Constitution, the President may hold that a situation has arisen in which the Government of the State cannot be carried on in accordance with the Constitution.

- A state's failure to comply with Union directions may be treated as a situation justifying constitutional action against the State.
- Thus, **Article 365**, if a State fails to comply with Union directions, it **can be considered a situation where the constitutional machinery has failed**, justifying action (like President's Rule). **So, Statement 3 is correct.**

26. The 'Doctrine of Pith and Substance' is primarily used by the Judiciary to:
    (a) Determine if a law violates the Fundamental Rights of a citizen.
    (b) Resolve a conflict between the Legislative and Executive branches.
    (c) Determine the true nature of a law when it "encroaches" upon a subject outside the legislature's jurisdiction.
    (d) Check if a Constitutional Amendment follows the procedure laid down in Article 368.

EXPLANATION:

The Doctrine of pith and substance, sometimes known as incidental encroachment, is a product of Canadian jurisprudence that has been applied to the Government of India Act, 1935, and the current Constitution.

- The idea of pith and substance is employed in such instances to determine which legislature has the authority to implement such legislation. The Court must consider the genuine **nature and character of the law**, whether it essentially comes within the authority of the legislature passing it, and whether it is valid even though incidentally it touches upon some matter within the competence of another legislature.
- In general, the Parliament and state legislatures are supposed to stay in their allocated sectors and not trespass on each other's jurisdiction. Otherwise, the legislation would be declared illegal by the Judiciary. But first, it will apply the Doctrine of pith and substance to determine the true authority under which the aforementioned piece of law comes.
- To put it another way, the idea of pith and substance is used to identify which category a piece of legislation belongs to. However, the powers bestowed on each level are certain to intersect at some point. It is impossible to draw a clear line between the competencies of separate legislatures as they will inevitably overlap at times.

The Doctrine of Pith and Substance is used in constitutional law to examine the true nature and character of legislation, especially when there is an apparent overlap between subjects in the Union and State Lists. **So, Option (c) is correct.**

27. With reference to the changes made in the National Emergency provisions of the Indian Constitution, consider the following statements:
    1. The 38th Constitutional Amendment Act made the satisfaction of the President in proclaiming an Emergency immune from judicial review.
    2. The 42nd Constitutional Amendment Act, 1976, allowed the National Emergency to be declared for part of India as well.
    3. The 44th Constitutional Amendment Act replaced the term "internal disturbance" with "armed rebellion" and restored judicial review.
    4. The 44th Amendment also provided that a Proclamation of Emergency must be approved by both Houses of Parliament within one month by a special majority.

Which of the statements given above are correct?
(a) 1, 3 and 4 only
(b) 1 and 2 only
(c) 2, 3 and 4 only
(d) 1, 2, 3 and 4

EXPLANATION:

Under **Article 352**, the President can declare a national emergency when the security of India or a part of it is threatened by war or external aggression or armed rebellion.

- It may be noted that the President can declare a national emergency even before the actual occurrence of war or external aggression or armed rebellion, if he is satisfied that there is an imminent danger.
- The **38th Amendment Act of 1975** made the declaration of a National Emergency immune to judicial review. **So, Statement 1 is correct.**

The 42nd Amendment to the Constitution of India, enacted in 1976 during the Emergency, marked a substantial and transformative overhaul of the country's supreme legal document.

- Often dubbed the "Mini Constitution," this Amendment introduced significant changes across multiple dimensions.
- One of its key features of the 42nd Amendment Act is that it enabled the President to limit the operation of a National Emergency to the entire country or limited to a specified part of India. **So, Statement 2 is correct.**

Originally, the Constitution mentioned "**internal disturbance**" as a ground for the proclamation of a National Emergency, but the expression was vague and had a wider connotation.

- The **44th Amendment Act of 1978 substituted the term "armed rebellion" for "internal disturbance."**
- The 38th Amendment Act of 1975 made the declaration of a National Emergency immune from judicial review. This provision was **subsequently removed by the 44th Amendment Act of 1978**, thereby restoring judicial review.
- In the Minerva Mills v. Union of India (1980), the Supreme Court held that the proclamation of a National Emergency can be challenged in a court on grounds of mala fide, extraneous or irrelevant facts, or if it is absurd or perverse. **So, Statement 3 is correct.**

The proclamation of Emergency must be approved by both Houses of Parliament within one month from the date of its issue.

- Originally, the period allowed for approval was two months, but it was **reduced to one month by the 44th Amendment Act of 1978**.
- Every resolution approving the proclamation of Emergency must be passed by either House of Parliament by a special majority, i.e.,
  - a majority of the total membership of the House, and
  - a majority of not less than two-thirds of the members present and voting.
- This special majority provision was introduced by the 44th Amendment Act of 1978. **So, Statement 4 is correct.**

28. With reference to equality and customary practices in India, consider the following statements:
    1. Under Article 14, courts may apply principles of equality when a customary practice is uncertain or not proven.
    2. A customary practice automatically prevails over constitutional principles even if it results in discrimination.

    Which of the statements given above is/are correct?
    (a) 1 only
    (b) 2 only
    (c) Both 1 and 2
    (d) Neither 1 nor 2

EXPLANATION:

Under **Article 14 of the Constitution of India**, courts uphold the principle of equality. If a customary practice is **uncertain, ambiguous, or not proven**, courts may rely on constitutional principles like equality to decide the matter. This ensures fairness and prevents arbitrary discrimination. **So, Statement 1 is correct.**

- The Constitution of India, which came into force in 1950, marked a new era of legal governance, where constitutional supremacy became paramount. While recognising the **historical importance of customary law**, the Constitution established a legal framework that safeguarded fundamental rights and ensured that no law, including customary law, could violate the basic principles of justice, equity, and liberty.
- In India, the Hindu Marriage Act, 1955 and the Hindu Succession Act, 1956, codified personal laws but also preserved the role of customs within the Hindu community, subject to the condition that these customs do not contradict the Constitution's guarantees of equality and justice.
- **Sarla Mudgal v. Union of India (1995)** – The Court held that polygamy, as a customary practice among certain Muslim communities, was inconsistent with the constitutional principle of equality, as **enshrined in Article 14**
- The landmark case, The **State of Bombay v. Narasu Appa Mali** Accused, adjudicated by the Bombay High Court on July 24, 1951, examined the interplay between personal laws and fundamental rights under the Indian Constitution.
  - The central issue revolved around the validity of the Bombay Prevention of Hindu Bigamous Marriages Act, 1946, challenged **under Articles 14, 15, and 25** of the Constitution.
  - The Bombay High Court upheld the constitutionality of the Act and concluded that it did not infringe upon fundamental rights.
  - The Court emphasised the legislature's authority to enact social reforms aimed at societal welfare, even if such reforms interface with religious practices.

In the case of **Shayara Bano v. Union of India (2016)**, the constitutionality of 'Triple Talaq' was challenged as it violated the fundamental rights of Muslim women. By this practice, a Muslim man could divorce a woman instantly by pronouncing 'talaq' three times.

- It was argued that the practice was arbitrary and violated fundamental rights.
- The Supreme Court observed that 'Triple Talaq' violates **Articles 14, 21, and 25** of the Constitution, as it denies equality, dignity, and justice to women.
- The Court held that personal laws and customary practices cannot override the principles of equality and fundamental rights enshrined in the Constitution.
- It declared the practice of 'Triple Talaq' as unconstitutional and discriminatory.

Therefore, it is understood that, the customary practices do not prevail over constitutional principles, especially when they result in discrimination. **So, Statement 2 is not correct.**

29. With reference to the powers of the Governor regarding the bills passed by the State Legislature, under the Constitution of India, consider the following statements:
    1. The Governor may return a Bill other than a Money Bill for reconsideration by the State Legislature.
    2. If the Bill returned by the Governor is passed again by the State Legislature with or without amendments, the Governor is bound to give assent to it.
    3. The Governor is constitutionally bound to reserve certain categories of Bills for the consideration of the President.

    Which of the statements given above are correct?

    (a) 1 and 2 only
    (b) 2 and 3 only
    (c) 1 and 3 only
    (d) 1, 2, and 3

EXPLANATION:

The Governor possesses veto powers over both Ordinary Bills and Money Bills passed by the State Legislature.

Every **ordinary Bill**, after it is passed by the legislative Assembly in case of a unicameral legislature or by both the Houses in case of a bicameral legislature, either in the first instance or in the second instance, is presented to the Governor for his/her assent. He/she has four alternatives:

- He/she may give his/her assent to the Bill, and the Bill then becomes an act.
- He/she may withhold his/her assent to the Bill; the Bill then ends and does not become an act.
- **He/she may return the Bill for reconsideration of the House or Houses**. If the Bill is passed by the House or Houses again with or without amendments and presented to the Governor for his/her assent, the **Governor must give his/her assent to the Bill**. Thus, the Governor enjoys only a 'suspensive veto'.
- He/she may reserve the Bill for the consideration of the President.

Every money bill, after it is passed by the state legislature (unicameral or bicameral), is presented to the Governor for his/her assent. He/she has three alternatives:

- He/she may give his/her assent to the Bill, and the Bill then becomes an act.
- He/she may withhold his/her assent to the Bill; the Bill then ends and does not become an act.
- He/she may reserve the Bill for the consideration of the President.

Thus, the **Governor cannot return a money bill for reconsideration by** the state legislature. Normally, the Governor gives his/her assent to a money bill as it is introduced in the state legislature with his/her previous permission.

Therefore, the Governor may return a Bill other than a Money Bill for reconsideration by the State Legislature. **So, Statement 1 is correct.**

Recently, the Supreme Court ruled that withholding assent must be followed by returning the Bill to the Assembly. But **the judgment rules that even if the Assembly passes the Bill a second time, the Governor retains the Option to reserve it for the President**. This removes **the binding nature of the legislature's second passage**. Consequently, whether at first instance or after reconsideration, a Governor can refer a Bill to the President under Article 200.

Thus, the Governor is not bound to give assent to the Bill if the Bill returned by the Governor is passed again by the State Legislature with or without amendments. **So, Statement 2 is not correct.**

Article 200 of the Constitution of India states that, when a Bill has been passed by the Legislative Assembly of a State or, in the case of a State having a Legislative Council, has been passed by both Houses of the Legislature of the State, it shall be presented to the Governor and the Governor shall declare either that he assents to the Bill or that he withholds assent therefrom or that he **reserves the Bill for the consideration of the President.**

- Provided that the Governor may, as soon as possible after the presentation to him of the Bill for assent, return the Bill if it is not a Money Bill together with a message requesting that the House or Houses will reconsider the Bill or any specified provisions thereof and, in particular, will consider the desirability of introducing any such amendments as he may recommend in his message and, when a Bill is so returned, the House or Houses shall reconsider the Bill accordingly, and if the Bill is passed again by the House or Houses with or without Amendment and presented to the Governor for assent, the Governor shall not withhold assent therefrom:
- Provided further that the Governor shall not assent to, but shall reserve for the consideration of the President, **any Bill which, in the opinion of the Governor, would, if it became law, so derogate from the powers of the High Court as to endanger the position which that Court is by this Constitution designed to fill**.

Thus, the Governor is constitutionally bound to reserve certain categories of Bills for the consideration of the President. **So, Statement 3 is correct.**

30. Consider the following with respect to the 'Annual Financial Statement' (AFS) under Article 112:
    1. The President shall, in respect of every financial year, cause to be laid before both the Houses of Parliament the Annual Financial Statement.
    2. It is discussed in the Lok Sabha, but not in the Rajya Sabha.
    3. Both 'Vote on Account' and 'Vote of Credit' are passed after the full discussion of the Budget in the Lok Sabha.

    How many of the above statements is/are correct?

    (a) Only one
    (b) Only two
    (c) All three
    (d) None

EXPLANATION:

Under Article 112 (1) of the Constitution, the President shall, in respect of every financial year, cause to be laid before both the Houses of Parliament a statement of the estimated receipts and expenditure of the Government of India for that year, in this Part referred to as the "annual financial statement". **So, Statement 1 is correct.**

Under Article 112, the President causes the Annual Financial Statement (Budget) to be laid before **both Houses of Parliament (Lok Sabha and Rajya Sabha).**
While only the Lok Sabha can vote on the Demands for Grants, the Rajya Sabha has the right to conduct a general discussion on the Budget. **So, Statement 2 is not correct.**

As per Article 116(1) (a), the House of the People has the power "to make any grant in advance pending the completion of the procedure prescribed in article 113", which means a Vote on Account is granted before the completion of the budget discussion, not after it.
Further, Article 116(1)(b) states that Parliament can make a grant "for meeting an unexpected demand when the demand cannot be stated with the details ordinarily given in an annual financial statement", which defines a Vote of Credit as an emergency provision, again not dependent on full budget discussion. **So, Statement 3 is not correct.**

31. With reference to the review jurisdiction of the Supreme Court of India, consider the following statements:
    1. Article 137 empowers the Supreme Court to review its own judgments.
    2. A Review Petition must be filed within a prescribed time limit from the date of the judgment or order.

    Which of the statements given above is/are correct?
    (a) 1 only
    (b) 2 only
    (c) Both 1 and 2
    (d) Neither 1 nor 2

EXPLANATION:

The power of review is distinct from the Court's appellate jurisdiction. When hearing a review petition against its own judgment or order, the Court does not rehear the case as in an appeal.

- The purpose of a review petition is limited to correcting an apparent error or preventing grave injustice resulting from a Supreme Court decision.
- The Court exercises this power only in cases where there is an error apparent on the face of the record (in criminal cases) or in accordance with the provisions of the Code of Civil Procedure, 1908.

Constitutional Provision – Article 137:

- Article 137 of the Constitution of India empowers the Supreme Court to review any of its judgments or orders. **So, Statement 1 is correct.**

- This power is subject to the Rules made by the Supreme Court under Article 145, as well as any law enacted by Parliament.

Time Limit for Filing Review Petition:

- As per the Supreme Court Rules, 2013, a review petition must be filed within **30 days** from the date of the judgment or order. **So, Statement 2 is correct**.
- It is generally placed before the same Bench that delivered the decision.
- Thus, a review petition must be filed within a prescribed time limit, and the Supreme Court is empowered to review its own judgments.

32. Consider the following countries:
    1. Finland
    2. Belarus
    3. Poland
    4. Latvia

    How many of the above countries border both Russia and Ukraine:
    (a) Only one
    (b) Only two
    (c) Only three
    (d) All four

EXPLANATION:

Among the listed countries, **Poland (via the Kaliningrad exclave of Russia) and Belarus** share borders with both Russia and Ukraine. **So, Statements 2 and 3 are correct.**

- **Belarus** is a landlocked country bordered by Lithuania and Latvia to the northwest, by **Russia** to the north and East, by Ukraine to the south, and by **Poland** to the West.
- **Ukraine** is bordered by 7 European Nations: by Belarus in the north; by Hungary, Slovakia and Poland in the West; by Moldova and Romania in the southwest; and by **Russia** in the East and northeast.
- **Russia** shares land borders with 14 sovereign countries: Norway, Finland, Estonia, Latvia, Lithuania, **Poland (via Kaliningrad exclave),** Belarus, Ukraine, Georgia, Azerbaijan, Kazakhstan, China, Mongolia, and North Korea.
- **Poland** is bordered by 7 nations. Germany in the West, the Czech Republic in the southwest, Slovakia in the south, Ukraine in the southeast, Belarus in the East and Lithuania and **Russia in the northeast**.
- Finland is bordered to the north by Norway, to the East by Russia, to the south by the Gulf of Finland, to the southwest by the Gulf of Bothnia, and to the northwest by Sweden. **So, Statement 1 is not correct.**
- Latvia shares a border with Russia, Estonia, Belarus, and Lithuania. **So, Statement 4 is not correct.**

33. Consider the following statements:

Statement I:

The Earth experiences a small change in annual insolation during the revolution.

Statement II:

This change does not have a great effect on daily weather changes.

Which one of the following is correct with respect to the above statements?

(a) Both Statement I and Statement II are correct, and Statement II is the correct explanation for Statement I.

(b) Both Statement I and Statement II are correct, and Statement II is not the correct explanation for Statement I.

(c) Statement I is correct, and Statement II is incorrect.

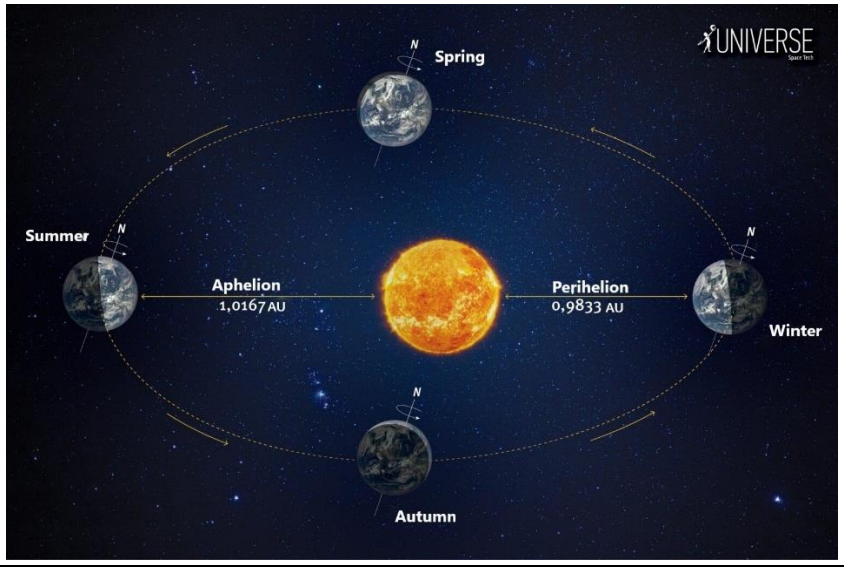
(d) Statement I is incorrect, and Statement II is correct.

EXPLANATION:

The Earth's surface receives most of its energy in short wavelengths. The energy received by the Earth is known as incoming solar radiation, which is, in short, termed as insolation.

- As the Earth is a geoid resembling a sphere, the Sun's rays fall obliquely at the top of the atmosphere, and the Earth intercepts a very small portion of the Sun's energy.
- On average, the Earth receives 1.94 calories per sq. per minute at the top of its atmosphere.
- The solar output received at the top of the atmosphere varies slightly in a year due to the variations in the distance between the Earth and the Sun. **So, Statement I is correct.**
- During its revolution around the Sun, the Earth is farthest from the Sun (152 million km) on 4th July. This position of the Earth is called aphelion.
- On 3rd January, the Earth is the nearest to the Sun (147 million km). This position is called perihelion.
- Therefore, the annual insolation received by the Earth on 3rd January is slightly more than the amount received on 4th July.
- However, the effect of this variation in the solar output is masked by other factors like the distribution of land and sea and the atmospheric circulation. Hence, this variation in the solar output does not have a great effect on daily weather changes on the surface of the Earth. **So, Statement II is correct.**

Both statements are individually correct. While Statement II doesn't explain why the small change in annual isolation during the revolution did not have a great effect on daily weather changes. **Both Statement I and Statement II are correct, and Statement II is not the correct explanation for Statement I.**



34. Consider the following features:
    1. It has a literacy rate of more than 65 per cent.
    2. Its forest cover is more than 20 per cent.
    3. It is the largest producer of pulses in India.

    Which of the following states has the above features?

    (a) Madhya Pradesh
    (b) Rajasthan
    (c) Karnataka
    (d) Maharashtra

EXPLANATION:

- **Literacy Rate**:
  - Madhya Pradesh's literacy rate, **at 69.3 per cent**, is lower than the national average of 73 per cent, as of the 2011 census.
  - The Literacy rate in Rajasthan has seen an upward trend and is 66.11 per cent as per the latest population census.
  - The literacy rate in Karnataka has seen an upward trend and is 75.36 per cent as per the latest population census.
  - The Literacy rate in Maharashtra has seen an upward trend and is 82.34 per cent as per the latest population census.
- **Forest Cover**: According to the India State of Forest Report (ISFR) 2023, India's total forest cover is 21.71% of its geographical area.
  - **Madhya Pradesh (25-26%)**, Karnataka (20-21%), Maharashtra (21-22%), and Rajasthan (4-5%).
- **Pulses production**: India is the largest producer (25% of global production). **Madhya Pradesh is India's top pulse-producing state**, contributing roughly **25-33%** of the total, followed by Maharashtra (13-15%) and Rajasthan (12-16%). Karnataka: (7% to 11%)

Thus, Madhya Pradesh has a literacy rate of over 69 per cent. Its forest cover exceeds 25 per cent of the state's area. It is the largest producer of pulses in India. **So, Option (a) is correct.**

35. São Paulo is at a longitude of roughly 46 degrees West. If it is 6:00 a.m. in London, what is the expected time in São Paulo?

    (a) 3:00 a.m.
    (b) 9:00 a.m.
    (c) 4:00 a.m.
    (d) 8:00 a.m.

EXPLANATION:

Earth's Rotation and Longitudes:

The Earth rotates from West to East over its axis. It makes the Sun rise in the East and set in the West. The rotation of the Earth over its axis takes 24 hours to complete one circle or 360° of longitude. As 180°of longitudes fall both east and West of the Prime Meridian, the Sun, thus, takes 12 hours' time to traverse the eastern and western hemispheres.

Rate of Time Calculation:

- The Sun traverses **15°of longitudes per hour**, or one degree of longitude in every four minutes of time.
- It may further be noted that the time decreases when we move from West to East and increases with our westward movement.
- The rate of the time at which the Sun traverses over certain degrees of longitude is used to determine the local time of an area with respect to the time at the Prime Meridian (0°Longitude).

Time Calculation:

- The prime meridian, which runs through **Greenwich, England**, has a **longitude of 0 degrees**.
- It divides the Earth into the eastern and western hemispheres.
- **São Paulo** in Brazil is at a **longitude of roughly 46 degrees West**.
- Difference between London and Sao Paulo = 46 -0 = 46°Longitude
  Total Time difference = 46*4 = 184
  = 184/60 = **3.06 hours**
- São Paulo lies west of London; its local time is behind London.
  So, 6.00 a.m. – 3.00 hours = 3.00 a.m.

Thus, the expected time in São Paulo is 3.00 a.m. **So, Option (a) is correct.**

36. Consider the following statements:
    1. The tributaries include Tila, Seti and Beri.
    2. The river originates outside India.
    3. It merges with the Ganga at the Uttar Pradesh - Bihar border.

    Which of the following rivers is mentioned above?
    (a) Kosi
    (b) Chambal
    (c) Ghaghara
    (d) Yamuna

EXPLANATION:

The Kosi River is one of the major left bank tributaries of the Ganga River.

- **Tributaries**: The Kosi River has its source in Tibet, which includes the world's highest upland; it then drains a large part of Nepal before emerging onto the Gangetic plains. Its three major tributaries are the **Sun Kosi, the Arun and the Tamur**. **So, Option (a) is not correct.**

- **Originates**: The Kosi River originates outside India, primarily in the Himalayan regions of Nepal and Tibet.
- **Merges with Ganga**: The river then emerges on the great plain of northern India in Bihar state on its way to the Ganges River, which it enters south of Purnea after a course of about 724 km.
- Therefore, the river Kosi rises outside India, and its tributaries are **the** Sun Kosi, the Arun and the Tamur (Not Tila, Seti and Beri). **So, Option (a) is not correct.**

Chambal River, a river in northern India. The Chambal is the chief tributary of the Yamuna River.

- **Tributaries**: The Banas, Kali Sindh, Sipra, and Parbati are its chief tributaries.
- **Originates**: It rises in the Vindhya Range just south of Mhow, western Madhya Pradesh state.
- **Merges with Ganga**: The Chambal River is a tributary of the Yamuna River in central India, and thus forms part of the greater Gangetic drainage system. The Chambal River does not merge directly with the Ganges (Ganga); it merges with the Yamuna River near Bhareh in the Etawah district of Uttar Pradesh, which subsequently flows into the Ganges.

Therefore, the river Chambal rises in Madhya Pradesh (Not outside India) and its tributaries are Banas, Kali Sindh, Sipra, and Parbati (Not Tila, Seti and Beri). **So, Option (b) is not correct.**

Ghaghara River, a major left-bank tributary of the Ganges River.

- **Tributaries:** The river originates in the high Himalayas of Nepal, where it gathers water from mountain tributaries such as the **Tila, Seti, and Beri**. As it descends, it cuts through the Siwalik range, forming a deep gorge at Shishapani—marking its transition from the mountains to the plains.

- After emerging into the northern plains of India, it is joined by several important tributaries, including the **Kuwana, Rapti, and Little Gandak**, all flowing down from the Himalayan region to the north.
- Finally, as a major tributary of the Ganges River, the Ghaghara plays a key role in depositing fertile alluvium, helping to form the extensive and agriculturally rich plains of northern Uttar Pradesh.

➢ **Originates**: It rises as the Karnali River (Chinese: Kongque He) in the high Himalayas of the southern Tibet Autonomous Region, China, and flows southeast through Nepal.

➢ **Merges with Ganga:** The Ghaghara River merges with the Ganga near Chhapra in Bihar, near the Uttar Pradesh border.

So, all statements match the Ghaghara River. **So, Option (c) is correct.**

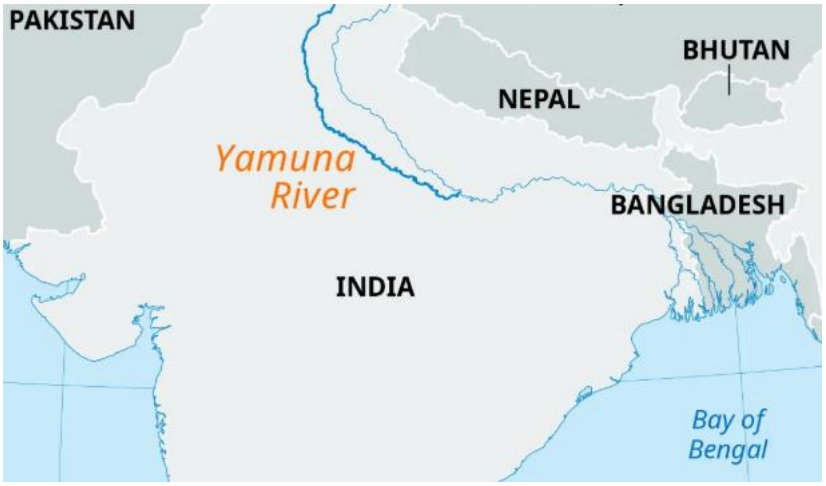
Yamuna River, a major river of northern India, primarily in Uttarakhand and Uttar Pradesh states. It is one of the country's most sacred rivers.

➢ **Tributaries:** Tons, Chambal, Hindon, Betwa and Ken are important tributaries of the Yamuna River. Other small tributaries of the Yamuna River include the Giri, Sind, Uttangan, Sengar and the Rind.

➢ **Originates**: The Yamuna rises on the slopes of the Bandarpunch massif in the Great Himalayas near Yamnotri (Jamnotri) in western Uttarakhand.

➢ **Merges with Ganga:** Near Prayagraj (Allahabad), after a course of about 855 miles (1,376 km), the Yamuna joins the Ganges (Ganga) River. The confluence of the two rivers is an especially sacred place to Hindus and is the site of annual festivals as well as the Kumbh Mela, which is held every 12 years and is attended by millions of devotees.

Therefore, the river Yamuna rises in the state of Uttarakhand (Not outside India), and its tributaries are the Tons, Chambal, Hindon, Betwa and Ken (Not Tila, Seti and Beri). **So, Option (d) is not correct.**



37. Consider the following pairs:

Sl. No.	Site	Location	Known for
1.	Kalgoorlie	South Africa	Gold
2.	Iquique	Mexico	Nitrates
3.	Chuquicamata	Chile	Copper

How many of the above pairs is/are correctly matched?

(a) Only one
(b) Only two
(c) All three
(d) None

EXPLANATION:

Kalgoorlie–Boulder is a regional city in the Goldfields–Esperance region of Western Australia (not South Africa). In a remote part of the Western Australia outback lies one of the world's largest holes in the ground. Known as the Super Pit, the Fimiston Open Pit is part of what is known as the Golden Mile, where gold has been mined continuously since 1893. The mine sits right next to Kalgoorlie-Boulder. **So, Pair 1 is not correct.**

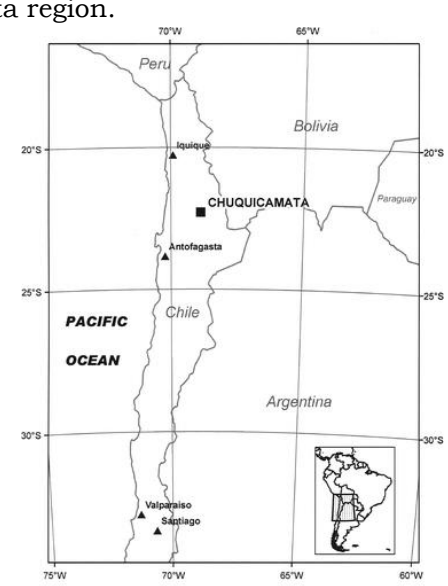
- The first gold rush here occurred around 1890. The easy-to-reach gold is gone, but small pieces and flakes remain.
- Australia is the second-largest gold producer in the world, after China. Sparse vegetation surrounds Kalgoorlie and the mine.

Iquique is in northern Chile, not Mexico. It is located on a rocky peninsula in the Atacama Desert, overlooking the Pacific Ocean. Its anchorage is protected from the open sea by the low, barren offshore island of Serrano, which is connected to the mainland by a stone causeway.

- It was the major port city for nitrate exports from the 1830s until the 1930s. These nitrates are also called white gold or Chile saltpetre. **So, Pair 2 is not correct.**

Chuquicamata, mining and smelting centre, northern Chile. The Atacama Desert of northern Chile has minimal vegetation. But it has ample mineral wealth: large amounts of copper, gold, silver, and other industrial metals.

- The Chuquicamata mine, located in northern Chile, is one of the largest open-pit copper mines and the second deepest open-pit mine in the world. Popularly known as Chuqui, the mine has been operating since 1910. **So, Pair 3 is correct.**
- The Chuquicamata mine is located 1,650km north of Santiago in Chile and 15km north of Calama, in Chile's Antofagasta region.



38. A ship is unable to exit the Strait of Hormuz. It has decided to dock in one of the countries of the Persian Gulf. In which of the following countries can the ship not dock?
    (a) Iraq
    (b) Kuwait
    (c) Saudi Arabia
    (d) Yemen

EXPLANATION:

The Strait of Hormuz is a narrow sea passage, separating the Arabian Peninsula and Iran, and connecting the Persian Gulf with the Gulf of Oman and the Arabian Sea.

- A ship unable to exit the Strait would need to dock in one of the countries bordering the Persian Gulf.
- The Persian Gulf is bordered by eight countries. Iran lies along its northern and eastern coast, while **Iraq lies to the northwest**.

- The southern and western shores are bordered by Oman, the United Arab Emirates, Qatar, Bahrain, **Saudi Arabia**, and **Kuwait**. Thus, **ships can dock in Iraq, Kuwait, and Saudi Arabia** since these countries border the Persian Gulf.
- However, a **ship cannot dock in Yemen** as it does not have a coastline along the Persian Gulf and instead lies along the Arabian Sea and the Red Sea. **So, Option (d) is correct.**

39. With reference to India- European Union Free Trade Agreement (FTA), consider the following statements:
    1. Products of marine, leather, footwear, chemicals, plastics/rubber, sports goods, toys, gems and Jewellery will get tariff reductions by 90%.
    2. Under the deal, AYUSH practitioners (or) Indian traditional medicine service persons will be able to provide their services to Europe.
    3. On motor vehicles, the tariffs will be gradually reduced to 10% from the current 110% under a quota system.
    4. The agreement provided tariff concessions for Indian goods under the Carbon Border Adjustment Mechanism.

    How many of the above statement(s) is/are correct?

    (a) Only one
    (b) **Only two**
    (c) Only three
    (d) All four

EXPLANATION:

Recently, **India and the European Union (EU)** announced the conclusion of negotiations for a Free Trade Agreement (FTA), an important milestone in one of India's most strategic economic partnerships.

- India and EU are 4th and 2nd largest economies, comprising 25% of Global GDP and account for one third of global trade.
- Integration of the two large, diverse, and complementary economies will create unprecedented trade and investment opportunities.

Outcomes of the concluded India- European Union Free Trade Agreement (FTA):

- India has secured unprecedented market access for more than 99% of Indian exports by trade value to the EU that also bolsters the 'Make in India' initiative.
- Beyond goods, it unlocks high-value commitments in services complemented by a comprehensive mobility framework enabling seamless movement of skilled Indian professionals.

- The India–EU FTA gives a decisive boost to its labour-intensive sectors such as textiles, apparel, leather, footwear, marine products, gems and jewellery, handicrafts, engineering goods, and automobiles bringing down tariffs up to 10% on almost 33 bn USD of exports to **zero** (not reductions by 90%) on entry into force of the Agreement. **So, Statement 1 is not correct.**
- The FTA is expected to provide a boost to Indian traditional medicine services and practitioners. In the EU Member States where regulations do not exist, AYUSH practitioners will be able to provide their services using the professional qualifications they gain in India. **So, Statement 2 is correct.**
- The FTA outlines a phased reduction in import duties on Completely Built Units (CBUs), with tariffs expected to decline from current levels of up to 110% to nearly 10% over a defined transition period. **So, Statement 3 is correct.**

The **Carbon Border Adjustment Mechanism** (CBAM) is the EU's tool to put a fair price on carbon emitted during the production of carbon-intensive goods that are entering the EU, and to encourage cleaner industrial production in non-EU countries.

- CBAM will apply in its definitive regime from 2026, with a transitional phase of 2023 to 2025.
- This gradual introduction is aligned with the phase-out of free allowances under the EU Emissions Trading System (ETS) to support the decarbonisation of EU industry.
- The Europeon Union has not provided any concessions to India on its carbon regulations in the trade pact, but has agreed that any relaxations granted by the 27-nation bloc to other countries under the CBAM provisions will automatically extend to Indian exporters.

Thus, the agreement does not provide tariff concessions for Indian goods under Carbon Border Adjustment Mechanism. **So, Statement 4 is not correct.**

40. India has declared 2026 as the year of maritime co-operations with which of the following regional organisations?
    (a) African Union
    (b) BIMSTEC
    (c) ASEAN
    (d) Gulf Co-operation Council

EXPLANATION:

Recently, **India and ASEAN** designated **2026 as the "Year of Maritime Cooperation"** to boost Indo-Pacific partnership. In a joint declaration:

- ASEAN member states and India reaffirmed their commitment to promoting sustainable tourism and preserving cultural heritage.
- The summit theme, "**Inclusivity and Sustainability**," aligns with ongoing projects aimed at enhancing digital inclusion, building resilient supply chains, and increasing maritime connectivity.
- The designation of 2026 as the Year of Maritime Cooperation signals a significant step towards further solidifying these connections.

The declaration of 2026 as the Year of Maritime Cooperation highlights several strategic dimensions:

- **Maritime Security and Indo-Pacific Focus:** The announcement emphasizes India's pivotal role in the regional maritime order, including support for maritime domain awareness and capacity-building with ASEAN nations.
- **Blue Economy and Sustainable Maritime Growth:** The blue economy—covering marine resources, ports, shipping, and ocean governance—is an increasing focus for collaboration.
- **Reinforcement of the Act East Policy:** ASEAN is central to India's Act East Policy, and the maritime emphasis reflects a push for deeper strategic integration.
- **HADR and Resilience Partnership:** This highlights the importance of cooperation in disaster response, coastal resilience, and climate-induced maritime risks.

So, Option (c) is correct.

41. Article 51 of the United Nations Charter was in the news recently. Which of the following statements best explains Article 51?
    (a) Any UN Member may bring a dispute or situation to the attention of the Security Council or the General Assembly.
    (b) The Security Council determines if there is any threat to peace, breach of the peace, or Act of aggression. It then makes recommendations or decides what measures to take to maintain or restore international peace and security.
    (c) Nothing in the Charter affects the inherent right of individual or collective self-defence if an armed attack occurs against a UN Member — until the Security Council takes necessary measures to maintain peace and security.
    (d) All UN Members agree to make armed forces, assistance, and facilities (including passage rights) available to the Security Council when called upon, for maintaining international peace and security.

EXPLANATION:

Recently, Pakistan alleged that India violated Article 51 of the United Nations Charter in connection with India's Operation Sindoor.

United Nations Charter

- The United Nations can take action on a wide variety of issues due to its unique international character and the powers vested in its Charter, which is considered an international treaty.
- The Charter of the United Nations is the founding document of the United Nations.
- As such, the UN Charter is an instrument of international law, and UN Member States are bound by it.
- The UN Charter codifies the major principles of international relations, from sovereign equality of states to the prohibition of the use of force in international relations.

Article 51

- Nothing in the present Charter shall impair the inherent right of individual or collective self-defence if an armed attack occurs against a Member of the United Nations, until the Security Council has taken measures necessary to maintain international peace and security.
- Measures taken by Members in the exercise of this right of self-defence shall be immediately reported to the Security Council and shall not in any way affect the authority and responsibility of the Security Council under the present Charter to take at any time such action as it deems necessary in order to maintain or restore international peace and security. **So, Option (c) is correct.**

Other Relevant Articles of UN:

- **Article 35** refers to bringing disputes to UN bodies. **So, Option (a) is not correct.**
- **Article 39** describes the Security Council's powers. **So, Option (b) is not correct.**
- **Article 43** relates to Member States providing forces. **So, Option (d) is not correct.**

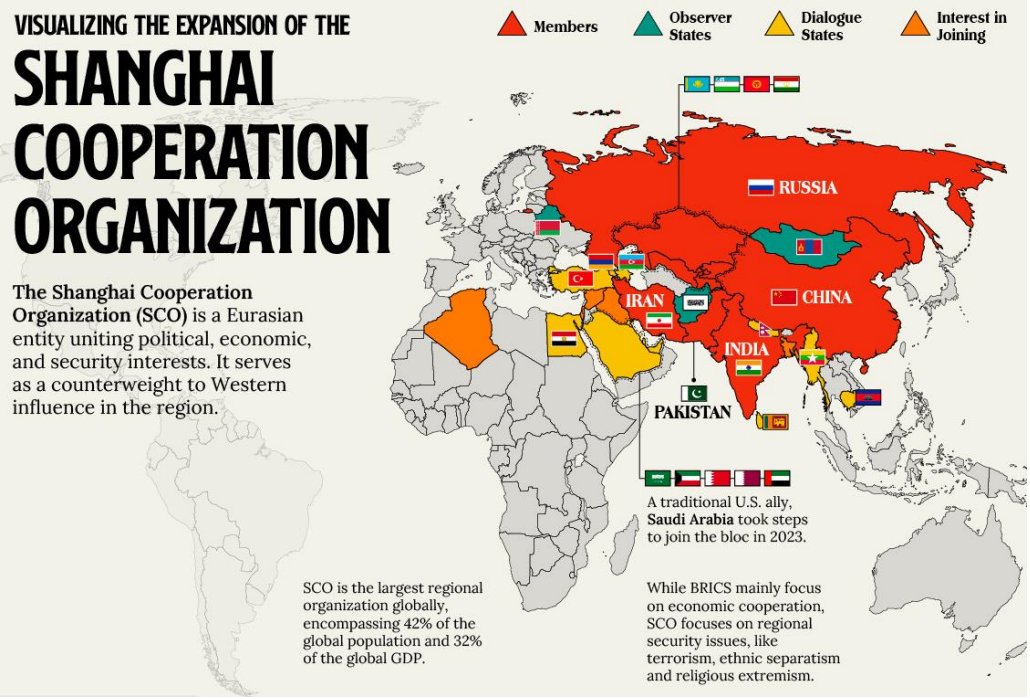
42. Consider the following countries:
    I. Kazakhstan
    II. Belarus
    III. Iran
    IV. Afghanistan
    V. Mongolia
    How many of the above are members of the Shanghai Cooperation Organisation (SCO)?
    (a) Only two
    (b) Only three
    (c) Only four
    (d) All five

EXPLANATION:

The **Shanghai Cooperation Organisation (SCO)** is a ten-member multilateral organisation, established on 15 June 2001 by the leaders of **Kazakhstan**, **China, Kyrgyzstan, Russia, Tajikistan and Uzbekistan**.

- These countries, except Uzbekistan, had been members of the Shanghai-5 group formed in April 1996.
- In 2001, Uzbekistan was admitted as a member (thus transforming it into the Shanghai-6). At the July 2005 Astana Summit, India, Iran and Pakistan were granted Observer status.
- In July 2015, in Ufa, Russia, the SCO decided to admit India (and Pakistan) as full members.
- In June 2017, at the Summit in Astana, India (and Pakistan) officially joined the SCO as a full member.
- **Iran** was granted the status of a Member State at the SCO Summit hosted virtually by India on 4 July 2023.
- **Belarus** was admitted as a new member at the SCO Summit in Astana on 4 July 2024.
- Apart from the 10 Members, the SCO has 2 Observers (Afghanistan and Mongolia) and 14 Dialogue Partners (Azerbaijan, Armenia, Cambodia, Nepal, Turkey, Sri Lanka, United Arab Emirates, Kuwait, Maldives, Bahrain, Myanmar, Egypt, Saudi Arabia and Qatar).
- As per the SCO Charter, Russian and Chinese are the only two official languages of the SCO.

Therefore only 3 out of the 5 mentioned countries **(Kazakhstan, Belarus, Iran)** are members of the SCO. **So, Option (b) is correct.**



43. Which one of the following describes the term 'Atlantification'?

(a) The gradual cooling of the North Atlantic Ocean is due to the weakening of the Atlantic Meridional Overturning Circulation.

(b) The northward intrusion of anomalous Atlantic waters and associated biota into the polar regions.

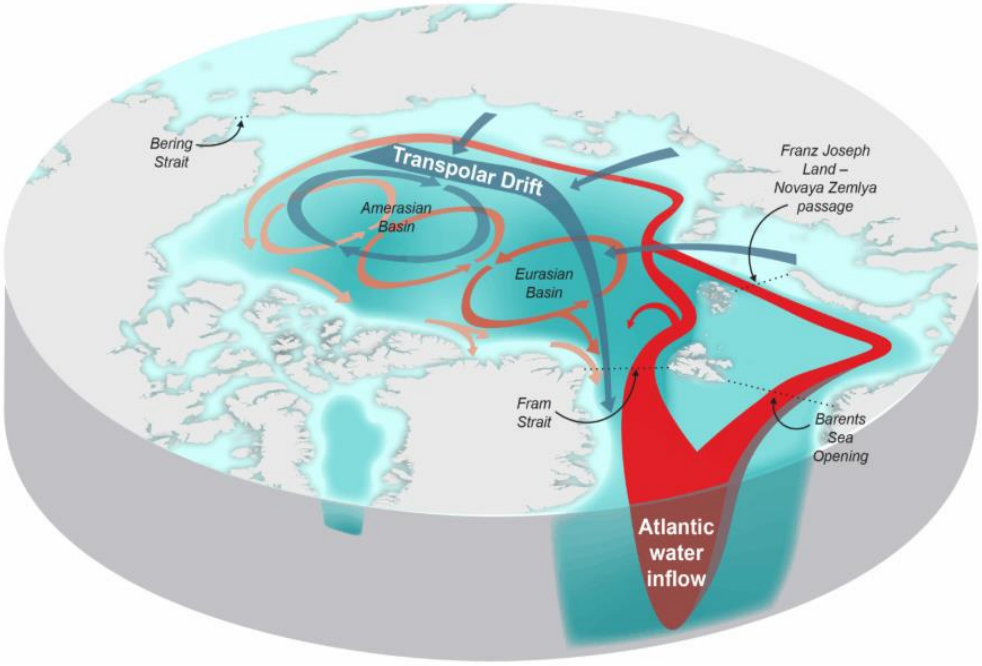
(c) The alteration of Arctic Ocean stratification is caused by increased freshwater inflow from Siberian rivers.

(d) The intensification of deep-water formation in the North Atlantic due to increased cooling and salinity at higher latitudes.

EXPLANATION:

The primary indicators of global climate change over the past few decades have been the significant decreases in sea ice and the warming of the Arctic's atmosphere and ocean.

- An important element of this high-latitude climate change has been the northward advection of anomalous subarctic Atlantic- and Pacific-origin waters and biota into the polar basins, known as **atlantification** and **pacification**, respectively.
- Atlantification means the northward inflow of anomalous waters and biota from the Atlantic into the polar basin. It has wide-ranging climatological ramifications. **So, Option (b) is correct.**
- Atlantification weakens Arctic Ocean stratification, enhancing heat transfer to the surface and undermining sea ice resilience. Changes brought on by atlantification are closely related to the advection of Atlantic Water over two Arctic gateways: the Fram Strait and the Barents Sea.
- Oceanic currents play an important role in the Atlantification by bringing oceanic heat to the Arctic Ocean from the lower latitude regions.



44. Recently, researchers have explored the wound-healing properties of a plant species locally known as "Murikooti Pacha" to develop an innovative and multifunctional wound-healing pad using nanomaterials such as electro-spun fibres. It grows abundantly across tropical regions, including India.

With reference to the above Statement, which of the following plants is referred to as "Murikooti Pacha"?

(a) Aloe Vera
(b) Centella asiatica
(c) Bacopa monnieri
(d) Red Ivy Plant

EXPLANATION:

Researchers at the Jawaharlal Nehru Tropical Botanic Garden & Research Institute (JNTBGRI), Palode, Kerala, have tapped into the wound-healing properties of the red ivy plant.

- **The red ivy plant, known locally as "murikooti pacha"** (Strobilanthes alternata, belonging to the Acanthaceae family), is to develop an innovative and multifunctional wound-healing pad using nanomaterials like electro-spun. **So, Option (d) is correct.**

- Red ivy grows abundantly across tropical regions, including India, and traditional practitioners have long been using it to treat cuts and wounds.
- **Acteoside** is a natural compound found in many plants, and its pharmacological activities and therapeutic potential are well-known. However, this is the first time acteoside has been linked to the **red ivy plant**. It is well-regarded for its significant neuroprotective, anti-inflammatory, antioxidant, antibacterial, and antitumor properties, offering high therapeutic potential for various diseases with a favourable safety profile in preclinical studies.
- The key ingredient in the multi-layered wound pad developed by the scientists is the acteoside molecule derived from the red ivy plant, which has high efficacy even at lower concentrations of 0.2%.
- The wound pad has been designed with a specially engineered electro-spun nanofiber layer, made from biodegradable and non-toxic polymers and is incredibly thin. Along with acteoside, it also incorporates the antibiotic neomycin sulfate, blended with FDA-approved polymers.

45. In the context of river management in India, the concept of Environmental Flow (E-flow) is primarily associated with how many of the following objectives?
    1. Maintaining the ecological integrity of river systems.
    2. Preventing salinity intrusion in coastal stretches of rivers.
    3. Ensuring dilution of pollutants and maintaining water quality.
    4. Maximising hydropower generation.

    Select the correct answer using the code given below:

    (a) Only one
    (b) Only two
    (c) Only three
    (d) All four

EXPLANATION:

The Environmental Flows (E-flows) Monitoring System has been developed by the National Mission for Clean Ganga, an arm of the Jal Shakti Ministry.

Environmental flow refers to the quantity, timing, and quality of water flow required to sustain freshwater ecosystems and the livelihoods that depend on them.

- **Ecological Integrity**: It is critical for maintaining the ecological integrity of rivers and their estuaries. E-flow also ensures significant benefits for human welfare, especially in areas where water use is highly competitive and regulated. **So, Statement 1 is correct.**
- **Salinity Intrusion**: Flows are needed for maintaining the river regime, making it possible for the river to purify itself, sustaining aquatic life and vegetation, recharging groundwater, supporting livelihoods, facilitating navigation, preserving estuarine conditions, preventing the incursion of salinity, and enabling the river to play its role in the cultural and spiritual lives of the people. A sustained, minimum freshwater flow acts as a physical barrier against the landward movement of seawater, particularly in estuaries and tidal rivers. **So, Statement 2 is correct.**
- **Dilution of Pollutants**: The shortage of water resources is one of the main problems in the world today, and water pollution and under-utilization of water resources are two factors contributing to this shortage. Appropriate supplement environmental flow can have a positive impact on dilution of pollutants, and consequently on fish habitats and the characteristics of the river channels. E-flow ensures sufficient water quantity, particularly in dry periods, to disperse effluents and maintain the natural self-purification capacity of water bodies. **So, Statement 3 is correct.**
- **Hydropower Generation**: Hydropower is important for renewable energy, but it harms river ecosystems. Environmental flows (E-flows) help maintain river health, but implementing them **reduces hydropower output**. Measures like avoiding zero-flow events, ensuring water in fishways and bypassed reaches, and allowing natural seasonal water-level variations to limit the water available for power generation. **So, Statement 4 is not correct.**

46. Indian roller, also known as Neelkantha, is a:
    (a) Fish
    (b) Reptile
    (c) Insect
    (d) Bird

EXPLANATION:

Neelkanth is a **bird** commonly known as the **Indian Roller**. Though the name "Neelkanth" literally means "blue throat," the Indian Roller does not have a distinctly blue throat in reality. **So, Option (d) is correct.**

- The name is symbolic and often linked to Lord Shiva's blue throat.
- The bird instead has striking turquoise and indigo wing feathers.
- Its name shows how culture and mythology strongly influence naming.

Breeding Behaviour:

- During the breeding season, male Indian Rollers perform spectacular aerial displays - twisting, rolling, and diving midair - to attract mates and defend territory.
- They produce croaking calls while flying, adding drama to their show.

Distribution and Habitat:

- The Indian Roller ranges from West Asia through the Indian subcontinent to parts of Southeast Asia, adapting to various habitats such as open grasslands, scrub forests, and human-modified landscapes.
- The Neelkanth mostly feeds on insects (especially beetles), but also catches spiders, small reptiles, amphibians, and grasshoppers

State Bird Status and Significance:

- The Indian Roller (Neelkanth) is the state bird of several Indian states, including Odisha, Karnataka, and Telangana.
- Its vivid blue plumage and cultural symbolism make it a national pride.

IUCN Status: Least Concern.

47. The 'CAMPA' (Compensatory Afforestation Fund Management and Planning Authority) funds are primarily used for:
    (a) Compensation to farmers whose land is acquired for national parks.
    (b) Afforestation, reforestation, and forest conservation activities when forest land is diverted for development.
    (c) Funding of eco-tourism projects in protected areas.
    (d) Compensation to tribals displaced from forest areas.

EXPLANATION:

The **Compensatory Afforestation Fund Management and Planning Authority (CAMPA**) has been created under the **Compensatory Afforestation Fund Act, 2016.**

- The Act provides for the establishment of funds under the Public Accounts of India and the Public Accounts of each State for depositing compensatory levies received from user agencies towards compensating the loss of forest and ecosystem services due to the diversion of forest land for non-forestry purposes, as per the provisions of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980.
- These funds are utilized for undertaking compensatory afforestation and related activities as per the provisions of the Compensatory Afforestation Fund (CAF) Act, 2016 and CAF Rules, 2018.
- CAMPA is meant to promote afforestation and regeneration activities as a way of compensating for forest land diverted to non-forest uses. **So, Option (b) is correct.**

The National CAMPA Advisory Council has been established as per the orders of the Hon'ble Supreme Court with the following mandate:

- Lay down broad guidelines for State CAMPA.
- Facilitate scientific, technological, and other assistance required by State CAMPA.
- Make recommendations to State CAMPA based on a review of their plans and programmes.
- Provide a mechanism to State CAMPA to resolve inter-state or Centre-State issues.

48. Consider the following statements regarding ozone:
    1. The ozone layer is concentrated primarily in the stratosphere between 15 and 35 km altitude.
    2. Trichlorofluoromethane is a major anthropogenic ozone-depleting substance.
    3. The Montreal Protocol is considered the most successful multilateral environmental agreement.

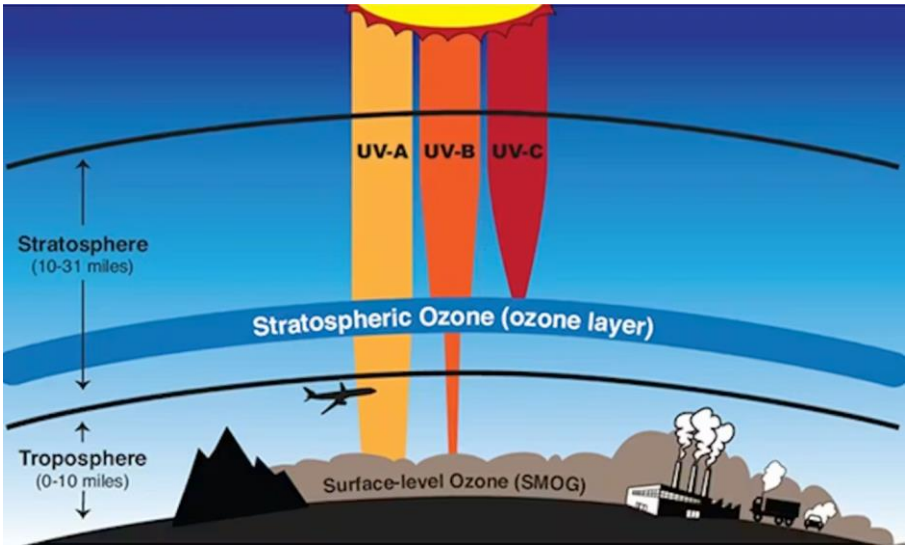
    Which of the above statements are correct?
    (a) 1 and 2 only
    (b) 1 and 3 only
    (c) 2 and 3 only
    (d) 1, 2 and 3

EXPLANATION:

Ozone is a naturally occurring molecule that is made up of three oxygen atoms. It has the chemical formula O3.

- The ozone layer is a region of high **ozone concentration in the stratosphere, 15 to 35 kilometres** above Earth's surface.
- The ozone layer is a thin part of Earth's atmosphere that absorbs almost all of the sun's harmful ultraviolet light.
- In particular the ozone layer protects us from the UV radiation, known as UV-B, which causes sunburn.

So, Statement 1 is correct.



Ozone Depleting Potential (ODP) is a measure of how much damage a chemical can cause to the ozone layer compared with a similar mass of trichlorofluoromethane (CFC-11).

- Chlorofluorocarbons (CFCs) are both powerful ozone-depleting substances (ODSs) and greenhouse gases (GHGs).
- **Trichlorofluoromethane (CFC-11, $CFCl_3$),** one of the **most abundant CFCs, is a major anthropogenic ozone-depleting substance** and greenhouse gas.
- Trichlorofluoromethane historically had a variety of industrial uses: as a solvent and cleaning agent, as a propellant in aerosol spray cans, as a refrigerant in refrigeration and air conditioning applications, and as a blowing agent in foams.
- CFC-11, with an ozone depleting potential of 1.0, is used as the reference substance for measuring ODP.
- The higher the ODP value, the greater the damage a chemical can cause to the ozone layer.
- Because of its significant impact on the ozone layer, the production and consumption of CFC-11 have been controlled under the Montreal Protocol, leading to a dramatic decline in emissions since the late 1980s. **So, Statement 2 is correct.**

The Montreal Protocol on Substances that Deplete the Ozone Layer is the landmark multilateral environmental agreement that regulates the production and consumption of nearly 100 man-made chemicals referred to as ozone depleting substances (ODS).

- When released into the atmosphere, those chemicals damage the stratospheric ozone layer, Earth's protective shield that protects humans and the environment from harmful levels of ultraviolet radiation from the sun.
- It was agreed internationally in 1987 to phase out ozone depleting substances, 197 countries have ratified the Montreal Protocol.

- In January 2012, South Sudan ratified the Montreal Protocol, making it the first international environmental treaty to achieve complete ratification — a truly remarkable effort that reflects the universal acceptance and success of the agreement.

Given all of these factors and more, the Montreal Protocol is considered to be one of the most successful environmental agreements of all time. **So, Statement 3 is correct.**

49. Consider the following information:

Sl.No	***Event***	***Significance***
1.	World Para Athletics Championships 2025	India became the first Asian nation to host the World Para Athletics Championships.
2.	Speed Skating World Championships 2025	Anandkumar Velkumar became India's first gold medalist in skating championships.
3.	World Boxing Championships 2025	Both men's and women's boxing events were held together for the first time.

How many of the above rows is/are correctly matched?

(a) Only one
(b) Only two
(c) All three
(d) None

EXPLANATION:

The World Para Athletics Championships is a premier biennial global event organised by World Para Athletics, a subcommittee of the International Paralympic Committee (IPC).

- It features elite track and field competition for athletes with physical, intellectual, and visual impairments.
- India hosted the 2025 World Para Athletics Championships.
- The New Delhi 2025 World Para Athletics Championships, held at the Jawaharlal Nehru Stadium, was the largest para-sport event ever organised in India, featuring over 2,100 participants from 100 countries competing across 186 medal events.
- India is the **fourth Asian nation** to host it after Qatar (2015), UAE (2019) and Japan (2024), not the first. **So, Pair (1) is not correct.**

The 2025 Inline Speed Skating World Championships were held in Beidaihe, China.

- **Anandkumar Velkumar** became the first Indian to win senior world titles, securing double gold (Senior Men's Marathon and 1000 m).

- Krish Sharma won gold in the junior 1000 m sprint.
- These achievements mark a historic breakthrough for India in speed skating at the world level. **So, Pair (2) is correct.**

World Boxing is a **not-for-profit international sports federation** aimed at ensuring boxing remains part of the **Olympic movement**.

- It was established in 2023 by national federations that seek to provide an alternative governing structure based on integrity, transparency, and good governance.
- Liverpool in England has been selected as the host city for the inaugural **World Boxing Championships 2025 for Elite men and women**.
- It is the first Elite-level global championships hosted by World Boxing, the new International Federation which has been set-up to ensure that boxing remains at the heart of the Olympic Movement.
- The action will feature competition in 10 weight classes **for both men and women,** and will be the first time ever that male and female boxers have competed in Olympic-style boxing for the title of world champion at the same event. **So, Pair (3) is correct.**

50. "The network under the initiative has emerged as a key vehicle for last-mile skilling among rural, tribal, women and marginalised communities".
The above Statement best describes which of the following initiatives?
(a) "Sankalp se Siddhi" - Village and Digital Connect Drive.
(b) Adi Sewa Kendra
(c) Jan Shikshan Sansthans (JSS)
(d) Aadi Mahotsav

EXPLANATION:

The Jan Shikshan Sansthans (JSS) network has emerged as a key vehicle for last-mile skilling among rural, tribal, women and marginalised communities. **So, Option (c) is correct.**

- The Jan Shikshan Sansthan (JSS) Scheme is one of three key schemes under the umbrella Central Sector Scheme' Skill India Programme (SIP)' of the Ministry of Skill Development and Entrepreneurship (MSDE) comprising of Pradhan Mantri Kaushal Vikas Yojana 4.0 (PMKVY 4.0),

Pradhan Mantri National Apprenticeship Promotion Scheme (PM-NAPS), and Jan Shikshan Sansthan (JSS) Scheme.

- The Scheme aims to impart skill development training in a non-formal mode to the target beneficiaries at the doorstep of the beneficiaries.
- JSSs are reaching the unreached areas to cater to the needs of the poorest of the poor. The objective of the Scheme is to increase household income by promoting self/wage employment through skill development training.
- The target beneficiaries of the Scheme are **non-literates, neo-literates** and persons having **a rudimentary level of education**, school **dropouts** up to class 12th and graduates, in the **age group of 15-45** years.

51. With reference to India's National Quantum Mission (NQM), consider the following statements:
    1. India is the seventh country in the world to have a dedicated national quantum mission.
    2. NQM targets developing quantum computers with 50–1000 physical qubits within 8 years, using platforms such as superconducting and photonic technologies.
    3. NQM's quantum communication objective includes satellite-based Quantum Key Distribution (QKD) over a range of 15000 km within and outside India.

    How many of the statements given above is/are correct?
    (a) Only one
    (b) **Only two**
    (c) All three
    (d) None

EXPLANATION:

Recently, India demonstrated a 1,000 km quantum communication network using indigenous technology under the National Quantum Mission (NQM).

About National Quantum Mission (NQM):

- The Union Cabinet approved the National Quantum Mission (NQM) on 19th April 2023 at a total cost of Rs. 6003.65 crore from 2023–24 to 2030–31, aiming to seed, nurture, and scale up scientific and industrial R&D and create a vibrant and innovative ecosystem in Quantum Technology (QT).
- This will accelerate QT-led economic growth, nurture the ecosystem in the country, and make India one of the leading nations in the development of Quantum Technologies and Applications (QTA).

Global Position of India

- India is the seventh country to have a dedicated quantum mission, after the US, Austria, Finland, France, Canada, and China. **So, Statement 1 is correct.**

- **Quantum Computing Objectives:** The mission objectives include developing intermediate-scale quantum computers with **50–1000 physical qubits in 8 years** on various platforms, such as superconducting and photonic technology. **So, Statement 2 is correct.**
- **Quantum Communication Goals:** Satellite-based secure quantum communications between ground stations over a range of 2000 kilometres within India, long-distance secure quantum communications with other countries, inter-city quantum key distribution over 2000 km, as well as multi-node quantum networks with quantum memories are also some of the deliverables of the mission. **So, Statement 3 is not correct.**
- **Quantum Sensing and Timing:** The National Quantum Mission focuses on developing magnetometers with high sensitivity in atomic systems and atomic clocks for precision timing, communications, and navigation.
- **Quantum Materials and Devices:** It also supports the design and synthesis of quantum materials such as superconductors, novel semiconductor structures, and topological materials for the fabrication of quantum devices, along with the development of single photon sources/detectors and entangled photon sources for quantum communications, sensing, and metrological application.

52. The term "Project Suncatcher", sometimes seen in the news, is best associated with which of the following?
    (a) A SpaceX initiative to beam solar energy collected in orbit back to Earth's power grids via microwave transmission.
    (b) **A Google research project to deploy solar-powered satellite constellations carrying AI processors in orbit.**
    (c) An ISRO programme to develop high-efficiency photovoltaic cells for rural electrification in India.
    (d) A European Space Agency mission to study solar wind patterns and their effect on Earth's magnetosphere.

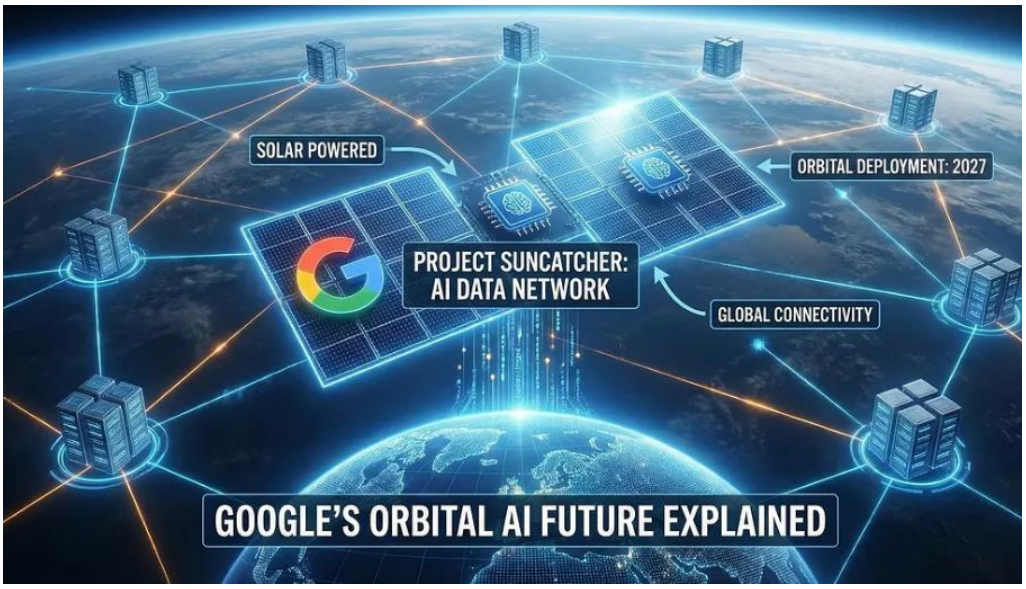
EXPLANATION:

Google has announced 'Project Suncatcher', a long-term research "moonshot" project designed **to test solar-powered data centres in orbit**, addressing the surging energy demands of Artificial Intelligence (AI) by moving computation beyond Earth's atmosphere.

- The new 'moonshot' project was jump-started because Google believed that space could be the best place to scale AI compute.
- Google is launching two solar-powered satellites in early 2027, each carrying four tensor processing units (TPUs)-the company's proprietary AI chips, which could run Al model training using power directly from the Sun.
- The project is part of **Google's Moonshot philosophy**, a radical idea which pushes the boundaries of space and engineering and often takes decades.
- A space-based data centre could be a reality by 2030.

Advantages and Potential:

- The advantages are radical-constant sunlight, minimal atmospheric loss, no nightfall and vacuum-based cooling that could **cut energy costs by up to 40 per cent** versus Earth-based data centres.
- **In the right orbit, solar panels could be up to eight times more productive than on Earth**, long durations of sunlight remove the need for heavy batteries, and cooling in space could significantly reduce energy and infrastructure costs.
- Google's estimates suggests that by 2030, the cost per kilowatt-year of operating space-based Al infrastructure could match that of terrestrial facilities.
- After major technology breakthroughs in quantum computing and autonomous driving, Google is now headed for off-planet computing, cementing its position as a deeptech research powerhouse. **So, Option (b) is correct.**



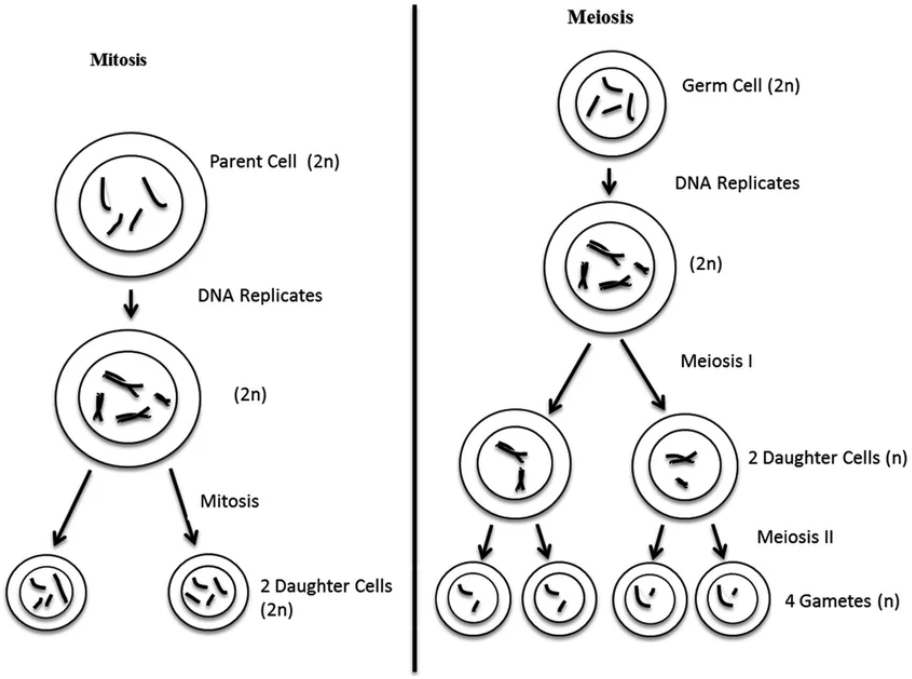
53. Consider the following statements regarding cell division and stem cell technology:
    1. Mitosis produces two genetically identical diploid daughter cells, whereas meiosis involves two rounds of division to produce four non-identical haploid cells.
    2. Embryonic stem cells are pluripotent and can differentiate into any cell type, while adult stem cells are generally multipotent and restricted to specific lineages.
    3. Induced Pluripotent Stem Cells (iPSCs) are generated by reprogramming mature somatic cells back to an embryonic-like state using specific transcription factors.
    4. Stem cells primarily utilise meiosis for their continuous self-renewal to maintain a constant population within adult tissues.

    How many of the above given statements is/are correct?
    (a) Only one
    (b) Only two
    (c) Only three
    (d) All four

EXPLANATION:

Mitosis and meiosis are two fundamental processes of cell division in eukaryotic organisms, crucial for growth and reproduction.

- **Mitosis** results in the **formation of two identical diploid daughter cells,** maintaining the same chromosome number as the parent cell. This process is primarily involved in producing somatic (body) cells or new individual cells in unicellular organisms.
- **Meiosis** is a specialised form of two divisions that **occur only in cells that produce gametes**, such as eggs and sperm. It **results in four unique haploid daughter cells,** each containing half the number of chromosomes of the parent cell, which is essential for restoring diploidy upon fertilisation. **So, Statement 1 is correct.**



Pluripotent Stem Cells (Embryonic Stem Cells)

- Pluripotent stem cells have the potential to differentiate into almost all cell types of the embryo except the cells of the extra embryonic support tissues (placenta and yolk sac).
- These cells can give rise to all the germ layers but are not able to form extra-embryonic tissues.
- Embryonic stem cells (ESCs) are pluripotent cells originating from the inner cell mass (ICM) of the blastocyst or epiblast cells.

- This pluripotent nature enables them to differentiate into any cell type derived from the three germ layers, making them vital for understanding cell development.

Multipotent Stem Cells (Adult Stem Cells)

- The multipotent cells have the ability to differentiate into a closely related family of cells. These multipotent stem cells can specialise into various types of cells within the specific cell lineage.
- Typically, adult stem cells are thought to have limited differentiation potential restricted to the cells found in the tissue where the stem cells reside.

For example:

- Multipotent hematopoietic (adult) stem cells can develop into various types of blood cells, such as red blood cells, white blood cells, and platelets.
- Similarly, neural stem cells can give rise to neurons, oligodendrocytes and astrocytes. After differentiation, the abilities of these cells are restricted to the cells of its specific lineage.

Thus, embryonic stem cells are pluripotent and can differentiate into any cell type, while adult stem cells are generally multipotent and restricted to specific lineages. **So, Statement 2 is correct.**

Induced pluripotent stem cell (iPSC) is a type of **stem cell generated from adult (mature) somatic cells through reprogramming by the expression of specific transcription factors**, enabling them to regain pluripotency and differentiate into any cell type in the body.

- Induced pluripotent stem (iPS) cells are derived from adult somatic cells and are reprogrammed by inducing specific genes and factors to become pluripotent.
- Induced pluripotent stem cells are similar to embryonic stem (ES) cells in many aspects, while embryonic stem cells form the inner cell mass of an embryo and are also pluripotent, giving rise to all cell types of the body. **So, Statement 3 is correct.**

Stem cells are non-specialised cells with an inherent property of self-renewal and potency i.e., they have the potential for self-renewal via **mitotic cell division (not meiosis)** and then differentiate into a wide range of specialised cell types.

- Stem cells are present in most of the multicellular organisms and are able to endure adverse conditions for long time periods.
- In humans, stem cells are found in umbilical cord, placenta, inner cell mass of the early embryo, few tissues of foetus and in some adult organs.

Thus, the stem cells do **not use meiosis** for self-renewal; they divide through **mitosis** to maintain tissue populations. **So, Statement 4 is not correct.**

54. Consider the following statements regarding 'Small Modular Reactors' (SMRs):
    1. SMRs are prioritised for deployment at 'brownfield' sites of retiring coal plants to facilitate industrial decarbonisation and captive power generation.
    2. SMR designs rely on passive systems and inherent safety features, such as low power and low operating pressure.
    3. SMRs require a comparatively reduced exclusion zone than the large-scale reactors.

    Which of the statements given above is/are correct?

    (a) 2 and 3 only
    (b) 1 and 3 only
    (c) 3 only
    (d) 1, 2 and 3

EXPLANATION:

Small Modular Reactors (SMRs) are advanced nuclear reactors with a power capacity of up to 300 MW(e) per unit, about one-third that of traditional reactors.

- This smaller, modular capacity enables flexible deployment, making them suitable for use at brownfield sites as captive power plants for rapid decarbonisation of energy-intensive sectors and for repurposing retiring fossil fuel-based power plants. **So, Statement 1 is correct.**

- SMRs are a promising technology for industrial decarbonisation, especially where a reliable and continuous power supply is required.

Advantages:

- SMRs take up less space than large reactors, leading to a smaller exclusion zone of about 500 meters around the reactor, compared to the 1–1.5 kilometre zones required for larger nuclear power plants. **So, Statement 3 is correct.**
- They are suitable for deployment at retired power plants and in off-grid areas.
- SMRs can be engineered with load-following characteristics for greater operational flexibility.
- They generally have lower construction time and capital cost, and their design can be standardised for serial production.

Small Modular Reactors designs are generally simpler than conventional reactors, and their safety concept relies more on passive systems and inherent safety features such as low power and operating pressure.

- These passive systems function without human intervention or external power, using natural processes like convection, gravity, and natural circulation to maintain safety and shut down the reactor if needed.
- As a result, SMRs have enhanced safety margins, significantly reducing the risk of unsafe radioactive releases in case of an accident. **So, Statement 2 is correct.**

55. With reference to "Project Kusha," recently in the news, consider the following statements:
    1. It is an indigenous long-range surface-to-air missile system developed by DRDO and Bharat Electronics Limited (BEL).
    2. The system features three distinct missile variants providing overlapping protection up to a range of 400 km.
    3. To ensure modularity, all missile variants utilise a common kill vehicle integrated with different booster stages.
    4. The project is designed to function as the core long-range interception layer of Mission Sudarshan Chakra.

    How many of the above given statements is/are correct?

    (a) Only one
    (b) Only two
    (c) Only three
    (d) All four

EXPLANATION:

Project Kusha is India's indigenous Long-Range Surface-to-Air Missile (LR-SAM) defense system, developed by DRDO to create a three-tiered, 400-km-range shield against stealth aircraft, cruise missiles, and drones.

The project, spearheaded by DRDO in partnership with Bharat Electronics Limited (BEL), as a key industrial partner responsible for radars and integration, is expected to integrate with the IAF's Integrated Air Command and Control System, allowing real-time coordination with military and civilian radars. **So, Statement 1 is correct.**

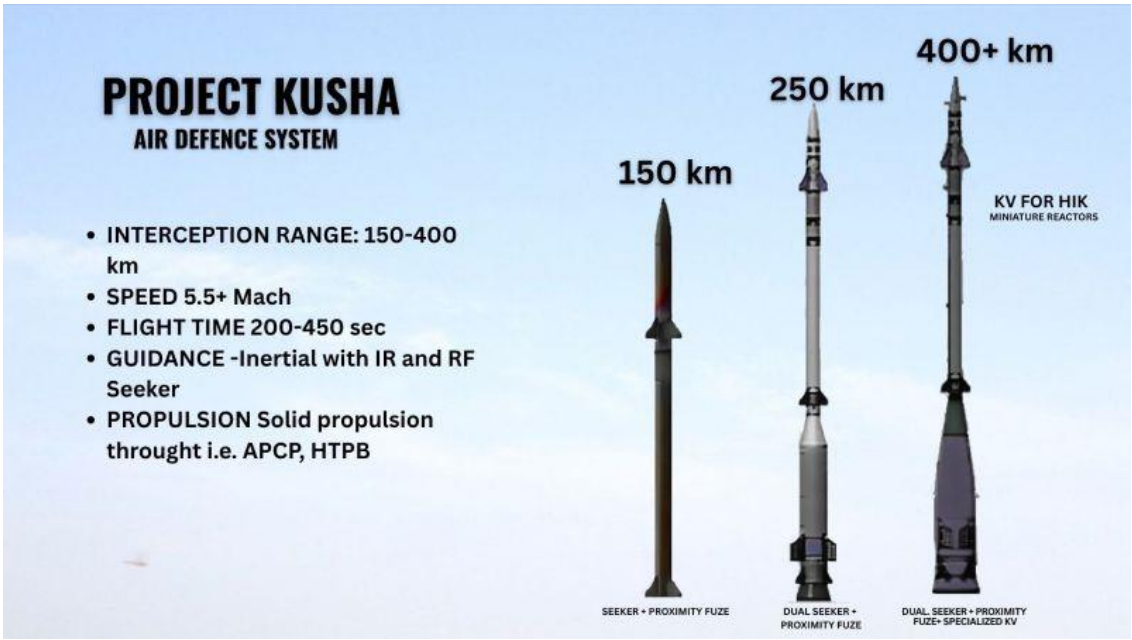
Often compared to Russia's S-400, it aims to reduce dependency on foreign suppliers by creating India's own' Iron Dome' by 2028-29.

Kusha comprises three variants of interceptors —**M1 (150 km), M2 (250 km),** and **M3 (350–400 km)** and features long-range surveillance and fire-control radars capable of tracking and destroying multiple targets simultaneously. **So, Statement 2 is correct.**

All three variants of Project Kusha will share a common kill vehicle, but each will be fitted with different boosters tailored to their operational range requirements.

- **Kusha-M1** will serve as the short-range component, equipped with missile systems capable of intercepting aircraft and incoming missiles at close distances.

- **Kusha-M2** will extend the coverage to medium-range threats, utilising surface-to-air missiles with greater reach.
- **Kusha-M3** is planned to offer interception capabilities at distances exceeding 400 km, rivalling some of the most advanced air defence systems globally. **So, Statement 3 is correct**.



A fully integrated security architecture, linking all air defence systems—including the planned Ballistic Missile Defence network, Project Kusha (Extended Range Air Defence System), and space-based capabilities—is being developed under Project Sudarshan Chakra.
Project Kusha is one of the key components of Project Sudarshan Chakra. It is India's indigenous long-range air defence system and is designed to complement, not replace, the S-400 Triumf system. **So, Statement 4 is correct.**

56. Based on the characteristics of the Infrared (IR) spectrum used in modern sensing and analysis, consider the following pairs:

Sl. No.	***IR Region***	***Specific Technological Application***
1.	Near-Infrared (NIR)	Non-destructive quantitative analysis of food composition and nutrients.
2.	Mid-Wavelength IR (MWIR)	Thermal tracking and guidance systems for heat-seeking missiles.
3.	Far-Infrared (FIR)	Terahertz imaging for advanced security screening and radio astronomy.
4.	Short-Wavelength IR (SWIR)	High-resolution in-line inspection of silicon wafers and semiconductors.

How many of the above given pairs is/are correctly matched?
(a) Only one
(b) Only two
(c) Only three
(d) **All four**

EXPLANATION:

Near-Infrared (NIR) spectroscopy is a method that makes use of the near-infrared region of the electromagnetic spectrum (**from about 700 to 2500 nanometers**).

- By measuring light scattered off and through a sample, NIR reflectance spectra can be used to quickly determine a material's properties without altering the sample.
- NIR spectroscopy, a non-destructive method, is widely used for online **quantitative analysis of beneficial food components to the human body**, which include proteins, polysaccharides, and polyphenols.
- Additionally, this technology is applied to food microbiological analysis, food safety detection (such as food adulteration), and food origin prediction.

NIR is widely used for **non-destructive chemical and nutritional analysis** in agriculture and food industries. **So, Pair (1) is correct.**

Mid-wave infrared (MWIR) is a subset of the infrared band of the electromagnetic spectrum, covering wavelengths from **3 µm to 5 µm (3,000 to 5,000 nm).**

- It represents the radiant heat detected by most cooled thermal imaging cameras.
- MWIR is effective in **detecting heat signatures from vehicles, aircraft, and missile launches**, making it **suitable for long-range surveillance and thermal imaging**.
- It plays a crucial role in battlefield surveillance and missile tracking by enabling identification of assets even in complete darkness.
- MWIR sensors are also used in missile detection systems to recognize heat from launched missiles, providing critical time to deploy defense countermeasures. **So, Pair (2) is correct.**

Far-infrared (FIR) covers long wavelengths from **15 micrometers to 1 millimeter**, extending beyond long-wave infrared (LWIR).

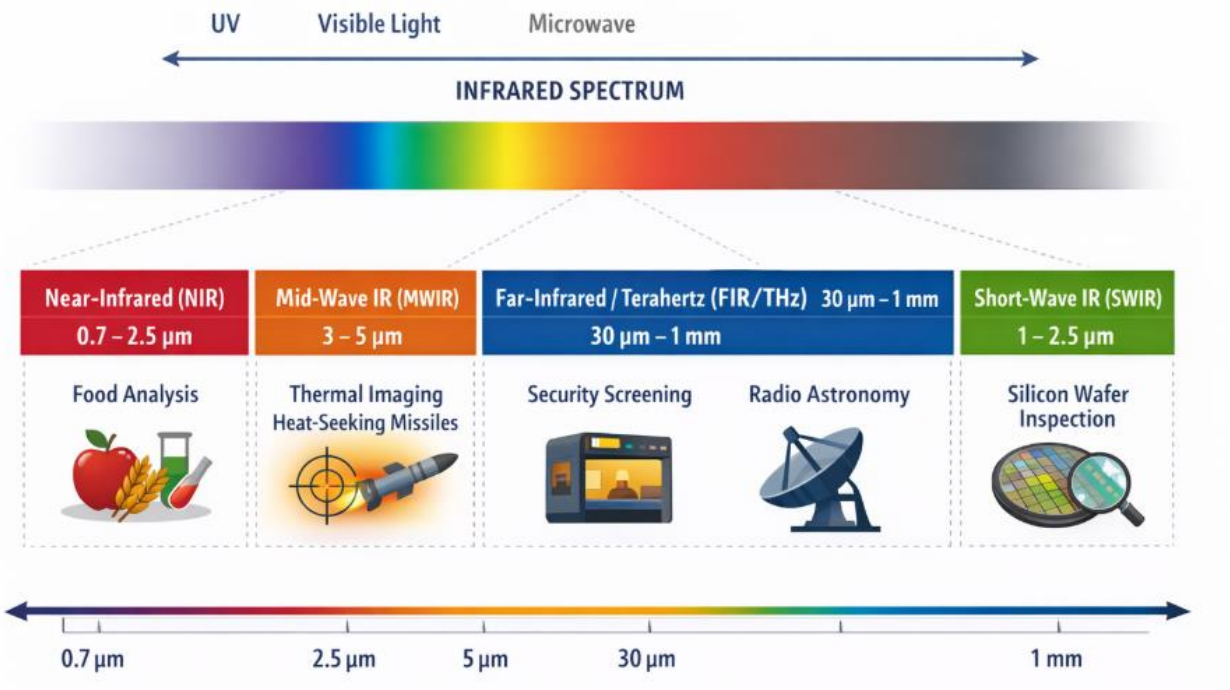
- FIR overlaps with the terahertz region and is used in **advanced imaging and astronomy**.
- It captures low-energy thermal radiation from cooler objects and is widely used in space science, infrared astronomy, environmental monitoring, and material analysis.
- FIR detectors allow researchers to study the Earth's thermal radiation, observe distant celestial bodies, and analyze heat emissions in scientific and industrial applications.

Terahertz Radiation

- Terahertz radiation has unique properties useful for security applications, as it can penetrate many non-conducting materials.
- It is a non-ionizing radiation used in security screening.

Key Features:

- Spectroscopy: Identifies chemicals through their unique spectral signatures, even when hidden in clothing.
- 2D Imaging: Detects metals, plastics, and ceramics, including materials difficult to identify using backscatter X-rays.
- 3D Imaging: Provides high-resolution imaging using short pulses, enabling detection of layered materials (e.g., powders inside envelopes). **So, Pair (3) is correct.**



Short Wave Infrared (SWIR) refers to the spectral range of electromagnetic radiation between **900 nm and 2,500 nm (nanometers**).

- SWIR imaging is invaluable in **detecting defects in silicon wafers**, inspecting solar panels, and monitoring manufacturing lines for micro-cracks or alignment issues that are invisible in visible light.
- SWIR has wider applications ranging from **semiconductor inspection** to agricultural quality control and defence surveillance. It offers a powerful tool for precision imaging.
- SWIR is widely used for high-resolution inspection of silicon wafers and semiconductor manufacturing due to its ability to penetrate silicon. **So, Pair (4) is correct.**

57. With reference to the Patents (Amendment) Rules, 2024 and 2025, consider the following statements:
    1. The time limit for filing a Request for Examination (RFE) has been reduced from 48 months to 31 months.
    2. The frequency of filing "Working of Patents" (Form 27) has been changed from once every fiscal year to once every three fiscal years.
    3. A "Certificate of Inventorship" has been introduced to recognise the specific contributions of individual inventors.

    How many of the above given statements is/are correct?
    (a) Only one
    (b) Only two
    (c) **All three**
    (d) None

EXPLANATION:

The Patent Rules, 2024 have been officially notified to simplify patent procedures and promote innovation, supporting economic development and fulfilling the Viksit Bharat Sankalp.
Some salient features of the revamped Rules are as follows:

- A new Certificate of Inventorship has been introduced to acknowledge the contribution of inventors. **So, Statement 3 is correct.**
- The provision for claiming the grace period under Section 31 has been streamlined by introducing Form 31.
- The time limit to furnish foreign application details (Form 8) has been reduced from six months from the date of filing to three months from the date of the first examination report.
- The time limit for filing a Request for Examination (RFE) has been reduced from 48 months to 31 months from the priority date or filing date, whichever is earlier. **So, Statement 1 is correct.**
- The provision to extend time limits and condone delays has been simplified, allowing extensions up to six months.
- The renewal fee has been reduced by 10% if paid in advance electronically for at least four years.
- The frequency of filing Form 27 (working of patents) has been reduced from once every financial year to once every three financial years, with a provision to condone delay up to three months. **So, Statement 2 is correct.**
- The procedure for pre-grant opposition under Section 25(1) has been streamlined by fixing fees and improving disposal to curb fraudulent practices and encourage genuine oppositions.

58. Consider the following statements with reference to Vijayanagar Architecture:
    1. Queens Bath
    2. Lotus Mahal
    3. Elephant Stable
    4. Royal Platform

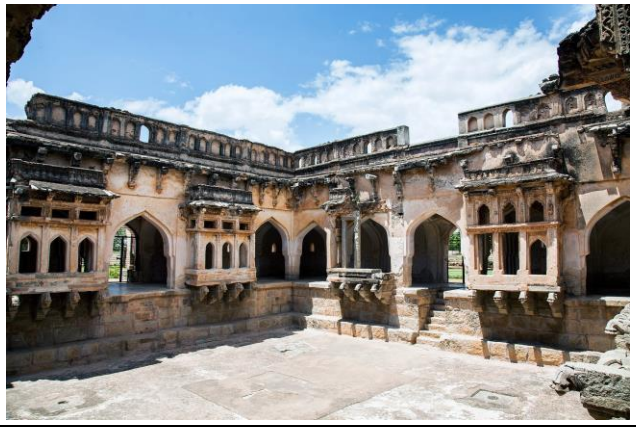
    How many of the above were constructed using a combination of Hindu and Islamic architectural styles?

    (a) Only one
    (b) Only two
    (c) Only three
    (d) All four

EXPLANATION:

The Queen's Bath at Hampi, Karnataka - an archaeological site in India, dates from the 16th century. It was built during the period of the Vijayanagara Empire.

- Like numerous other structures in Hampi, it is a UNESCO World Heritage Site.
- The Queen's Bath is an elaborate structure with a simple exterior and an ornate interior.
- Built in the **Indo-Islamic style** of architecture, this striking enclosed space is designed to be more unique than any other private or public bath in Hampi.
- This rectangular structure has a large sunken bath at its centre, surrounded by arched corridors with pillars and projecting ornate balconies with windows. **So, Statement 1 is correct**.



The Lotus Mahal (Lotus Palace), also referred to as Chitrangi Mahal, stands as a symbol of the Vijayanagara Empire's architectural prowess.
It is named for its resemblance to the unfurling petals of a lotus bud and reflects a fusion of Islamic and Hindu architectural styles. **So, Statement 2 is correct.**

The Elephant Stables in Hampi were used to shelter the royal elephants of the Vijayanagara Empire and are located just outside the Zenana Enclosure.

- It is one of the few structures that did not suffer extensive damage during the 1565 destruction of Hampi.
- Built in the Indo-Islamic style, the Elephant stable is a long rectangular structure with eleven domed chambers interconnected by large arched openings, each capable of housing two elephants. **So, Statement 3 is correct.**

The Mahanavami Dibba is one of the prominent structures at the archaeological site of Hampi, Karnataka.

- This large stone platform was historically used for royal ceremonies and public celebrations during the Vijayanagara Empire.
- It is part of a wider complex of remains that reflect the former grandeur of this Hampi.
- Located in the royal enclosure, it is associated with the festival of Mahanavami.
- It likely supported a wooden structure and was used by Vijayanagara kings to display power and conduct rituals.
- Though it shows diverse stylistic influences, it is primarily rooted in the Dravidian tradition and not a clear Indo-Islamic fusion structure. **So, Statement 4 is not correct.**

59. With reference to the development of music in India, which one of the following statements is ***not*** correct?
    (a) Amir Khusrau is credited with the creation of the sitar.
    (b) Swaramela Kalanidhi by Ramamatya describes Janaka and Janya ragas of South India.
    (c) Tansen introduced ragas such as the Miyan ki Malhar, Miyan ki Todi and Darbari.
    (d) Vrindavan Swami Haridas introduced Sarangi in India.

EXPLANATION:

Amir Khusrau (1253-1325), a celebrated court poet and musician of North India, is commonly credited with several innovations in Indian classical music.

- Known throughout the Persian-speaking world as **Amir Khusrau-e-Dihlawī** (Amir Khusrau of Delhi), Khusrau was court-poet to several kings in Delhi, most notable of whom was **Sultan' Alā-ud-dīn Khiljī**.
- Contemporary (or even some later) historians, however, do not remember him as a musician, but only as a poet.
- For instance, **Firishta**, who writes in detail of the court of 'Alā-ud-dīn Khiljī, lists Khusrau's name among the poets, not among the qawwāls or musicians.
- Khusrau is said to be the **inventor of the sitar** and the **tabla**. **So, Option (a) is correct.**
- But in addition to these musical instruments, he is said to have been the originator of genres such as the tarana and the qaul.
- He is also said to have composed numerous new ragas.

Svaramelakalanidhi is a seminal **16th-century Sanskrit treatise** on the theory and practice of Indian classical music, **authored by Ramamatya** in 1550 CE during the Vijayanagara Empire.

- This concise 25-page work addresses the fragmentation in contemporary music theory by proposing a mathematically precise tuning system and a structured classification of ragas into **20 melas (parent scales),** from which **64 janya ragas (derived scales) emerge**, marking a foundational shift toward modern Carnatic music frameworks. **So, Option (b) is correct.**
- Ramamatya, a minister and musician at the court of Rāma Raja in Vijayanagara, composed the text under royal patronage to reconcile conflicting musical traditions that had arisen since the 13th-century Saṅgītaratnākara of Śārṅgadēva.

Tansen, the sixteenth-century musician, composed several Dhrupads, the subject matter of which ranged from praise of deities to technical terms of music.

- He was the most famous musician of Akbar's court.
- Tansen wrote several Dhrupads in praise of Ramchandra Vaghela and Emperor Akbar.
- Among the four Banis of Dhrupad prevalent during that time – Khandar, Nauhar, Dagar and Govarhar, Tansen is believed to have initiated the Govarhar Bani.
- Some Ragas that have the prefix 'Miyan' before their names are associated with Tansen, e.g, **Miyan ki Sarang, Miyan Malhar, Miyan ki Todi, etc**.
- Apart from these, it is believed that he popularised **Darbari Kanhada**. **So, Option (c) is correct.**

Swami Haridas, popularly known as a saint musician of North India, is believed to be the incarnation of Lalita Sakhi, a close and dear friend of Radha.

- He is exclusively credited for composing a large number of devotional songs and **composing the Dhrupad music**, aside from creating new techniques of music.
- Swami Haridas is apparently the guru of the famous musician, **Tansen,** apart from having a galaxy of musicians in his court, namely, Bakshu, Bhanu, and Baiju.
- Celebrated for establishing the Haridasi School of Mysticism, Haridas was a pioneer in spreading dhrupad.
- It was his melodious voice and soulful language that inspired many people, declaring him a leading figure in the Bhakti movement and music.
- The **Turks are credited with bringing musical instruments like the rabab and the sarangi** into South Asia. **So, Option (d) is not correct.**

60. With reference to the various legislations passed for reforming the women's position, consider the following statements:
    1. The Indian Penal Code (IPC) of 1860 raised the marriageable age for girls to 12.
    2. The Age of Consent Act, 1891, prohibited sexual intercourse with girls below the age of 12.
    3. The Sarda Act (1929) raised the marriageable age for girls to 14 years.

    Which of the above given statements is/are ***not*** correct?

    (a) 1 only
    (b) 1 and 2 only
    (c) 3 only
    (d) 2 only

EXPLANATION:

Indian Penal Code, 1860 was enacted whereby sexual intercourse with a girl less than 10 years was penalised irrespective of the fact whether she had consented or not.
Even if the child was married and she was less than 10 years old, it was an offence for her husband to have sexual intercourse with such a child. Hence, there was parity insofar as the age of consent is concerned, and the fact that the child was married did not make a difference.
Thus, the Indian Penal Code (IPC) of 1860 did not raise the marriageable age to 12. Instead, it prohibited sexual intercourse with a girl below the age of 10 years. **So, Statement 1 is not correct.**

The Age of Consent Bill, 1891, was introduced in the legislature on 9th January 1891.

- The Act raised the age of consent from 10 years to 12 years for consummation or sexual intercourse in marriage or otherwise.
- The Act did not talk about the legal age of marriage; it merely stated the statutory age for giving consent, which was 10 years, before which a girl was considered incapable of marriage.
- The **Act regarded sexual intercourse by a man with a woman under the age of 12 as an offence**. This was made applicable even to the husband who entered sexual activity with a girl who was below the age of 12 years. **So, Statement 2 is correct.**

Rai Sahib Haribilas Sharda introduced his Hindu Child Marriage Bill in 1927. This Bill was referred to a committee known as the Joshi Committee in 1929. On the recommendations of this Committee, the Bill was passed by the Imperial Legislative Council of India in 1929.

- This Act was known as the Child Marriage Restraint Act and **also as the Sharda Act of 1929**.
- The main feature of this Act was to increase the legal marriage age.
- For the **boys, it was 18 years**, while for the **girls it was 14 years**. **So, Statement 3 is correct.**
- Further, the punishment for a male adult above 21 years of age, marrying a minor child was three months of imprisonment and a fine, whereas, for a male adult below 21 years the punishment was 15 days and a fine of up to Rs. 1000.

61. Which of the following were the major reasons for the British to capture the whole of India?
    1. Enormous profit from trade in India.
    2. To fund its adventures in America.
    3. Personal ambitions of individual leaders.
    4. To challenge the imperialism of France and Russia

    Select the correct answer using the code given below:

    (a) 1, 2 and 3 only
    (b) 2 and 4 only
    (c) 1, 3 and 4 only
    (d) 1, 2 and 4 only

EXPLANATION:

The East India Company initially entered India with the primary objective of trade and profit, attracted by the high demand in Europe for Indian goods such as textiles, spices, silk, and indigo.

- However, after decisive events like the Battle of Plassey, the Company realised that political control over Indian territories would help secure its commercial interests, ensure a steady flow of revenue (especially through land taxes), and minimise competition and risks to trade.
- Thus, territorial expansion did not replace economic motives but rather became a means to strengthen and sustain them. Profit remained the fundamental driving force behind British expansion in India. **So, Statement 1 is correct.**

The American War of Independence ended in the 1780s. British expansion in India was not linked to financing American wars. Britain was largely self-sustaining and focused on maximising profits locally in India.
British objectives in India were driven by trade, revenue collection, and strategic dominance rather than financing overseas wars in America. **So, Statement 2 is not correct.**

The personal ambitions of Company officials such as Robert Clive and Warren Hastings also influenced the expansion of British rule in India.

- Many of these individuals sought wealth, prestige, and power, often going beyond official instructions to expand territories.
- These Personal ambitions of individual leaders, initiatives and aggressive policies contributed to the rapid expansion of British authority in India. **So, Statement 3 is correct.**

British expansion in India was also shaped by the need to counter rival European powers and protect its strategic interests.

- In the early phase, the British competed with France during conflicts like the Carnatic Wars to establish dominance in India.
- Later, the fear of Russian expansion towards Central Asia led to strategic policies to secure India's northwestern frontiers, a rivalry often referred to as the "Great Game" involving Russia. **So, Statement 4 is correct.**

62. Consider the following statements:
    1. Mihira Bhoja, who founded the Gurjara Pratihara dynasty, defeated Palas and Rashtrakutas in the tripartite struggle for Kannauj.
    2. Dharmapala, who founded the Pala dynasty, established the Vikramashila University of Buddhism.

    Which of the statements given above is/are correct?
    (a) 1 only
    (b) 2 only
    (c) Both 1 and 2
    (d) **Neither 1 nor 2**

EXPLANATION:

The Gurjara Pratihara dynasty was **founded by Nagabhatta I** in the region of Malwa in the eighth century. He belonged to a Rajput clan.
Later, one of his successors, Vatsaraja, extended his rule over a large part of North India and made Kannauj in western Uttar Pradesh his capital.

Tripartite Struggle:

- Vatsaraja's policy of expansion brought him into conflict with Dharamapala, the Pala King of Bengal and Bihar.
- Soon, the Rashtrakuta king Dhruva from South India jumped into the fight. And thus began what is known as the **'Tripartite Struggle'**, i.e., a struggle among three powers.

- It continued for about the next hundred and fifty years under various succeeding kings with ups and downs.
- The Gurjara-Pratiharas, however, could continue to maintain their hold over Kannauj till the last.
- One of the important kings of this dynasty was Mihira Bhoja (ninth century).

Thus, the Gurjara Pratihara dynasty was **founded by Nagabhata I** (not Mihira Bhoja), and the Tripartite Struggle continued for nearly one hundred and fifty years under successive rulers. **So, Statement 1 is not correct.**

In eastern India, the **Pala dynasty was founded by Gopala** (8th century). As the names of all the succeeding kings ended with 'Pala', this dynasty came to be known as the 'Pala' dynasty.

Expansion and Rule:

- The son and grandson of Gopala, viz, Dharmapala and Devapala, greatly extended the power and prestige of the Pala dynasty.
- Though the Pratiharas checked their expansion towards the West, the Palas continued to rule over Bihar and Bengal for nearly four centuries, with a small break.

Religion and Cultural Contributions:

- The Pala kings were the followers of Buddhism.
- They greatly promoted Buddhism by making monasteries (viharas) and temples in eastern India.
- **Dharmapala is known to have founded the famous Vikramashila University** near Bhagalpur in Bihar.

Thus, the Pala dynasty was founded by Gopala, while Dharmapala established Vikramashila University. **So, Statement 2 is not correct.**

63. Hargarhi, hargarha, harsalli, and jangarha refer to:
    (a) Vedic period sacrificial sites
    (b) Buddhist monastic complexes
    (c) Bead-making centres of the Indus Valley Civilisation
    (d) Megalithic burial grounds

EXPLANATION:

Terms such as **Hargarhi, Hargarha, Harsalli,** and **Jangarha** are regional names used in parts of India to refer to **megalithic burial sites**. These are associated with the **Megalithic culture** (Iron Age), characterised by large stone structures used for burials. **So, Option (d) is correct.**

Megaliths in Jharkhand:

- Jharkhand is among India's leading megalith destinations.
- Hargaddi Chokahatu is home to the largest megalith site in Jharkhand.
- Apart from the site at Chokahatu, there are numerous megalithic sites commissioned by various tribal communities such as the **Mundas, Hos, Asurs and Oraons across 24 districts**. Each carries a distinctive feature.

Tribal Burial Practice:

- Every tribal village in the state has a burial ground with diverse names such as **hargarhi, hargarha, harsalli, and jangarha**.
- These sites comprise an assortment of varied megalithic architectures. The megalithic structures of each tribe vary as per their tradition, social stature of the deceased, cause of death and other reasons.

Cultural Significance:

- "Unlike other megalith sites in India and many parts of the world, the stones of Jharkhand are not remnants of a forgotten world.
- They are living witnesses, recording ancestry, astronomy, and human resilience across millennia.

64. With reference to methods of revenue assessment in medieval India, consider the following statements:
    1. In the batai system, revenue was collected based on the produce and not based on land measurement.
    2. In the Zabt system, one-third of the average yield was fixed as the State's share.

    Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

EXPLANATION:

During the medieval period, different methods of revenue assessment and collection were used.

- The simplest and most basic method was **crop sharing or batai**.
- The state fixed a certain ratio of produce as the state's share.
- In this method, out of the total produce, the state share was collected by a designated official.
- Here, the measurement of land had no bearing on revenue collection.
- The actual produce was the main focus of attention. **So, Statement 1 is correct.**
- Three types of crop sharing were in practice. These were:
  - **Batai:** Division of the crop at the threshing floor after the grain was obtained;
  - **Khet-batai:** Division of the field when the crop was standing;
  - **Langbatai:** Crop was cut and stacked in heaps without separating the grain. The share of the state was decided in this form.

The system of measurement **zabt** introduced by **Sher Shah Suri** was adopted and **improved by Akbar**.

- In the Zabt revenue system, based on the yields, the share of the state was decided.
- All the territories were divided into the revenue circles or dasturs.
- For each dastur circle, per bigha revenue rates for different crops in cash, based on productivity and prices, were worked out.
- Therefore, in the zabt revenue system, based on the yields, the share of the state was decided (not a fixed share). **So, Statement 2 is not correct.**

65. Consider the following pairs:

Sl. No.	***Revolutionaries***	***Conspiracy Cases***
1.	Rajendra Lahiri	Alipore conspiracy case
2.	Ghosh Brothers	Kanpur Bolshevik Conspiracy Case
3.	SA Dange	Kakori Conspiracy Case
4.	Kartar Singh Sarabha	First Lahore Conspiracy Case

Which of the pairs given above is/are correctly matched?

(a) 1 and 2 only
(b) 2 only
(c) 3 only
(d) 4 only

EXPLANATION:

The most important action of the Hindustan Republican Association/Army was **the Kakori robbery**.

- The men held up the 8-Down train at Kakori, an obscure village near Lucknow, and looted its official railway cash.

- Government crackdown after the Kakori robbery led to arrests of many, of whom 17 were jailed, four transported for life and four—Bismil, Ashfaqullah, Roshan Singh and **Rajendra Lahiri**—were hanged. Kakori proved to be a setback.

Thus, Rajendra Lahiri was associated with the Kakori Robbery and not with the Alipore Conspiracy Case. So, **Pair (1) is not correct.**

The first revolutionary groups were organised in 1902 in Midnapore (under Jnanendranath Basu) and in Calcutta (the Anushilan Samiti, founded by Promotha Mitter and including Jatindranath Banerjee, Barindra Kumar Ghosh and others)

- In December 1907, there were attempts to derail the train on which the lieutenant-governor, Sri Andrew Fraser, was travelling. In 1908, Prafulla Chaki and Khudiram Bose threw a bomb at a carriage supposed to be carrying a particularly sadistic white judge, Kingsford, in Muzaffarpur. Kingsford was not in the carriage. Unfortunately, two British ladies, instead, got killed. Prafulla Chaki shot himself dead while Khudiram Bose was tried and hanged.
- The whole Anushilan group was arrested, including **the Ghosh brothers**, Aurobindo and Barindra, who were tried in the **Alipore conspiracy case**, variously called the Manicktolla bomb conspiracy or Muraripukur conspiracy. (Barindra Ghosh's house was on Muraripukur Road in the Manicktolla suburb of Calcutta.) The Ghosh brothers were charged with 'conspiracy' or 'waging war against the King' – the equivalent of high treason and punishable with death by hanging.

Thus, the Ghosh brothers were involved in the Alipore conspiracy case and not with the Kanpur Bolshevik Conspiracy Case. **So, Pair (2) is not correct.**

The Communist Party of India resolved to liberate India from British imperialism and set up conditions for socialism. However, the Tashkent party did not have the support of other Indian revolutionary groups active in Europe. Nor did it have any connection with the revolutionary groups active in India.

- In the meantime, Indian Communist groups, active in Lahore, Bombay, Calcutta and Madras, decided to meet and organise a national conference in 1925 in Kanpur, an industrial town in present-day Uttar Pradesh with a substantial presence of industrial workers. The annual session of the Indian National Congress was also being held in Kanpur at the same time.
- The Kanpur conference resolved to set up the Communist Party of India and declared the creation of a workers and peasants republic as the main aim of the party. It also listed the liberation of India from British domination and the socialisation of means of production and distribution as its major objectives.
- Moreover, it was also in Kanpur that the British government had instituted the **Kanpur (Cawnpore) Bolshevik Conspiracy case against** Indian Communists in 1923, and charged them with conspiracy against the British Empire. Three Communist leaders — S V Ghate, **S A Dange** and Muzaffar Ahmad — were sentenced to four years. **So, Pair (3) is not correct.**

Kartar Singh Sarabha (24th May 1896 – 16th November 1915) was a Punjabi Sikh revolutionary who emerged as a leading figure in the Ghadar Movement, an early 20th-century effort by Indian expatriates to organise armed rebellion against British colonial rule in India.

Convicted in the **Lahore Conspiracy Case** for conspiring to wage war against the British Crown, Sarabha was sentenced to death on 13th September 1915 and executed by hanging in Lahore Central Jail, maintaining composure and reportedly smiling while reciting patriotic verses until the end. **So, Pair (4) is correct.**

66. Which of the following best describes the significance of the Taittiriya Upanishad during the period 1000–300 BCE?
    (a) A guide to Vedic sacrificial rituals
    (b) A text outlining the administrative structure of the Mahajanapadas
    (c) A philosophical treatise exploring the concept of Brahman and Atman
    (d) A historical record of Magadha's expansion

EXPLANATION:

The Taittiriya Upanishad is a sacred text from the Krishna Yajur Veda, exploring the nature of the Self (Atman) and Brahman (the Supreme Reality). It is divided into three chapters:

- **Shiksha Valli**, which gives instructions on ethics, education, and right conduct;
- **Brahmananda Valli**, which explains the five sheaths (Panchakosha) that cover the true Self; and
- **Bhrigu Valli**, which describes sage Bhrigu's journey of self-discovery through meditation.

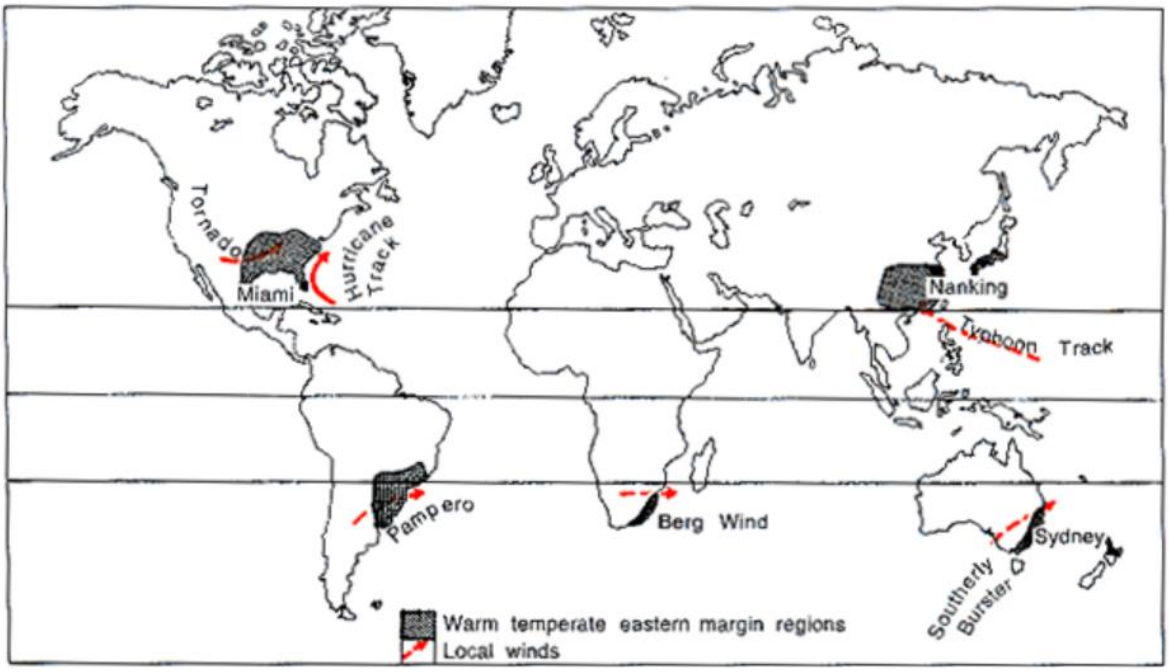
➢ The Upanishad emphasises that Brahman is Bliss (Ananda) and that realising this brings true happiness.
➢ It teaches the unity of the individual soul with the universal consciousness.
➢ Through ethical living, knowledge, and self-inquiry, the Taittiriya Upanishad guides one toward liberation (moksha). **So, Option (c) is correct.**

67. Consider the following economic activities:
1. Cultivation of sugarcane
2. Production of yerba mate
3. Plantation of Paraná pine
4. Practice of cattle rearing

The above are characteristic of which one of the following climatic regions?
(a) Hot and Wet Equatorial Climate
(b) Tropical Marine Climate
(c) Warm Temperate Western Margin (Mediterranean) Climate
(d) Warm Temperate Eastern Margin (Natal-type) Climate

EXPLANATION:

Warm Temperate Eastern Margin Climate is found on the eastern margins of continents in warm temperate latitudes, just outside the tropics. It has comparatively more rainfall than the Mediterranean climate in the same latitudes, coming mainly in the summer.



Three main types are:

- **The China type**: Central and north China, including southern Japan (temperate monsoonal),
- **The Gulf type**: South-eastern United States, (slight-monsoonal),

- **The Natal type**: All the warm temperate eastern margin (non-monsoonal areas) of the southern hemisphere, including Natal, eastern Australia and southern Brazil—Paraguay—Uruguay and northern Argentina.

➢ In South America, where rainfall is less than 40 inches, there is much grassland on which many cattle and sheep are kept for meat, wool and hides.
➢ It is the continuation of the Argentinian Pampas.
➢ The mild winters mean that the animals can be kept outdoors all the time.
➢ The extensive natural pastures provide valuable forage for both cattle and sheep.
➢ The products from these two kinds of domesticated animals account for over three-quarters of the annual exports of Uruguay.
➢ The remaining exports come mainly from wheat and flax.
➢ Further north in southern Brazil, the rainfall increases to more than 40 inches, and the forest gradually replaces grass. Here, the important occupations are the **cultivation of yerba mate (Paraguay tea)** and the **lumbering of araucaria or Parana pine**. **Cattle and sheep are reared,** and maise and **cane sugar are grown**.

Therefore, the above-mentioned economic activities are characteristic features of the Warm Temperate Eastern Margin (Natal-type) Climate. **So, Option (d) is correct.**

- **Hot and Wet Equatorial Climate:** too wet; focuses on crops like rubber, cocoa and oil palm. **So, Option (a) is not correct.**
- **Tropical Marine Climate:** mainly island/coastal tropics; doesn't match Paraná pine or yerba mate. **So, Option (b) is not correct.**
- **Mediterranean Climate:** dry summers; unsuitable for sugarcane and yerba mate. **So, Option (c) is not correct.**

68. You are climbing a mountain. Consider the following:
1. Sugarcane
2. Tea
3. Coffee

What is the correct order of crops you will see from the valley to the hilltop?
(a) 1-2-3
(b) 1-3-2
(c) 2-3-1
(d) 3-2-1

EXPLANATION:

Sugarcane originated in New Guinea. India stands first in area (3.93 m. ha) and production (167 m.t) among the sugarcane-growing countries of the world.

➢ Uttar Pradesh accounts for the largest area under cultivation of Sugarcane, nearly 50% of the country's total, and also leads in production, followed by Maharashtra.
➢ Sugarcane is a tropical plant. It grows more successfully in those regions where the climate is more or less tropical, but it can grow in sub tropics too, as in north India.
➢ Sugarcane is grown in the world from latitudes of 35° N and 35° S, **from sea level to 1000m of altitude or a little more**.

Tea: India is the second-largest producer of tea globally.

➢ The southern part of India produces about 17% of the country's total production, with the major producing states being **Tamil Nadu, Kerala, and Karnataka**.
➢ Tea requires well-drained soil with a high amount of organic matter and a pH of 4.5 to 5.5. The performance of tea is excellent at **elevations ranging from 1000 to 2500 m**. Optimum temperature: 20 - 27° C.

Coffee: Coffee requires a warm and wet climate and well-drained loamy soil. Hill slopes are more suitable for the growth of this crop. Brazil is the leading producer, followed by Colombia and India.

- Soil should be deep, friable, open textured, rich in plant nutrients, with plenty of humus and of a slightly acidic nature (pH – 4.5 to 6.5).
- Robusta varieties are excellent at **elevations ranging from 500 to 1000 m**, and Arabica varieties are excellent at **elevations ranging from 1000 to 1500**.

Thus, Sugarcane grows best in warm, low-altitude (valley) regions. Coffee prefers moderate altitudes. Tea thrives in higher altitudes (hilltops) with cooler climates. So, from valley to hilltop, the order is: Sugarcane **(1)** → Coffee **(3)** → Tea **(2)**. **So, Option (b) is correct.**

69. Consider the following statements regarding the vertical distribution of ocean water temperature:
    1. The upper layer of ocean water, known as the mixed layer or surface layer, has relatively uniform temperature due to wind-driven mixing and receives most of the solar radiation.
    2. Below the mixed layer lies the thermocline, a zone of rapid temperature decrease with increasing depth, separating the warm surface water from the cold deep water.
    3. The thermocline is absent or very weak in polar regions because surface water temperature is already close to that of the deep ocean, and the vertical temperature slightly increases with increasing depth.

    Which of the statements given above is/are correct?

    (a) 1, 2 and 3
    (b) 1 and 2 only
    (c) 1 and 3 only
    (d) 2 and 3 only

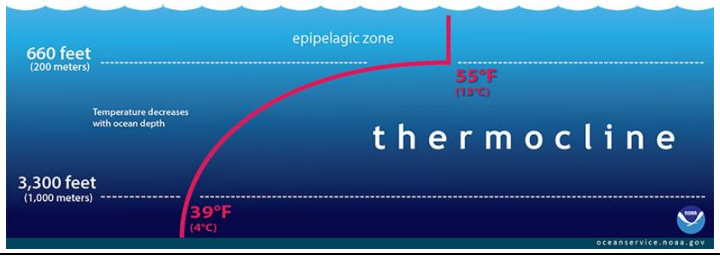
EXPLANATION:

The **upper layer of ocean water**, called the **mixed layer (or surface layer)**, has these key characteristics:

- **Uniform temperature**: Wind, waves, and currents continuously mix the water, distributing heat evenly throughout this layer.
- **Receives most solar radiation**: Sunlight penetrates only the upper part of the ocean, so this layer absorbs the majority of solar energy.
- **Active mixing**: Wind-driven turbulence keeps the temperature and salinity relatively consistent. **So, Statement 1 is correct.**

Below the surface layer lies the **thermocline**, which acts as a transitional zone between the warm surface waters and the cold deep waters.

- This zone generally ranges from 200 to 1000 meters in depth and is characterised by a rapid decrease in temperature with increasing depth.
- Within this layer, temperature can drop by as much as 20 °C.
- The thermocline also acts as a barrier to vertical mixing, limiting the exchange of heat and nutrients between the upper and lower levels. **So, Statement 2 is correct.**
- It coincides with **the pycnocline**, where the density of water increases rapidly with depth due to falling temperatures and in some areas, changing salinity.



The thermocline is absent or very weak in polar regions because surface water temperature is already close to that of the deep ocean, creating a nearly uniform vertical temperature profile. Due to extreme cold, there is little to no rapid temperature decrease (thermocline) with increasing depth.
Instead, the polar water column is generally uniformly cold from the surface to the bottom, sometimes showing a slight temperature increase with depth, often resulting in a weak, shallow, or nonexistent seasonal thermocline. **So, Statement 3 is correct.**

70. Which among the following rays creates the Ozone layer in the stratosphere?
    (a) X rays
    (b) Ultraviolet B
    (c) Ultraviolet C
    (d) Gamma Rays

EXPLANATION:

Ozone (O3) is a molecule made up of three atoms of oxygen (O), and is mostly found in the stratosphere, where it protects us from the Sun's harmful ultraviolet (UV) radiation. Although it represents only a tiny fraction of the atmosphere, ozone is crucial for life on Earth.
Ozone in the stratosphere is a layer of the atmosphere between 15 and 50 kilometres. Without ozone, the Sun's intense UV radiation would sterilise the Earth's surface. With a weakening of this shield, more intense UV-B and UV-A radiation exposure at the surface would lead to quicker sunburns, skin cancer, and even reduced crop yields in plants.
Formation of the ozone layer:

- There are natural processes that create and destroy ozone in the stratosphere. These processes regulate a balance of ozone and form the ozone layer.
- Ozone is created primarily by sunlight. When **high-energy ultraviolet rays (UV-C) strike an oxygen molecule (O2)**, **they split the molecule into two single oxygen atoms, known as atomic oxygen.**
- **A freed oxygen atom then combines with another oxygen molecule to form a molecule of ozone (O3)**. Because there is so much oxygen in our atmosphere, this "ozone-oxygen cycle" is continuously absorbing high-energy ultraviolet radiation (UV-C) and completely blocking it from reaching the Earth's surface. This process creates heat, which warms the upper part of the stratosphere. **So, Option (c) is correct.**

Ozone is very reactive and attacks other molecules in the air, often regenerating oxygen in the process. Also—and this is why ozone is important to us—ozone in the stratosphere absorbs much of the Sun's UV-B rays, splitting back into molecular and atomic oxygen. No matter how the oxygen atoms are produced, they almost always quickly react with oxygen molecules, reforming ozone.
So, while ozone is continually being replenished, it is also continually being destroyed. Sometimes an ozone molecule reacts with an oxygen atom, creating two oxygen molecules, thus ending the cycle. If the rate of ozone creation is equal to the rate of destruction, the total amount will remain the same.

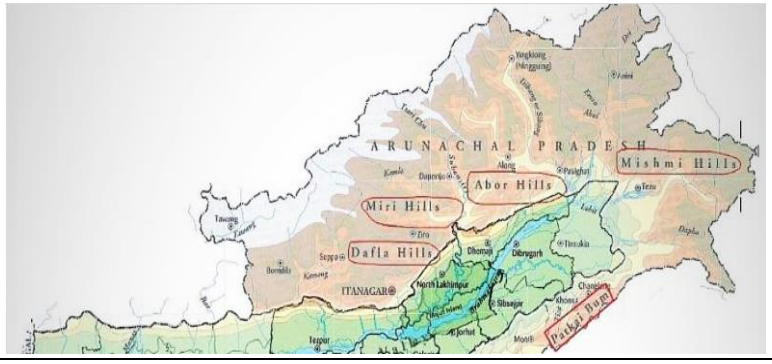
71. Consider the following hills located in Arunachal Pradesh.
    1. Dafla Hills
    2. Miri Hills
    3. Abor Hills
    4. Mishmi Hills

    Which one of the following is the correct order of these hills from West to East?
    (a) 1-2-3-4
    (b) 4-3-2-1
    (c) 1-3-2-4
    (d) 2-1-4-3

EXPLANATION:

The correct order of the hills from West to East in Arunachal Pradesh is Dafla Hills (1), Miri Hills (2), Abor Hills (3), and Mishmi Hills (4). **So, Option (a) is correct. 1-2-3-4**

- ***Dafla Hills:*** Located in Western Arunachal Pradesh, between the Kameng and Subansiri Rivers, along the Bhutan-Arunachal Pradesh border. It is inhabited mainly by the Nyishi (Dafla) tribe.
  - **Elevation:** Generally, it ranges from 1,000 to 2,000 metres.
  - **Rivers:** Source region for the Kameng River and several tributaries of the Subansiri.
- ***Miri Hills:*** Located between the Subansiri and Siang Rivers in central Arunachal Pradesh. They are occupied by the Miri (now called Mishing) tribe.
  - **Elevation:** Around 1,000–1,500 metres.
  - **Rivers:** The Subansiri River flows along its western margin.
- ***Abor Hills:*** Located between the Siang (Dihang) and Dibang valleys in central-eastern Arunachal Pradesh. Inhabited by the Adi (Abor) tribe.
  - **Elevation:** About 1,200–2,000 metres.
  - **Rivers:** The Siang River cuts deep gorges through these hills before entering Assam. Acts as a drainage divide between the Siang and Dibang systems.
- ***Mishmi Hills:*** Located in the easternmost part of Arunachal Pradesh, near the China and Myanmar borders. Inhabited by the Mishmi tribe.
  - **Elevation:** Varies from 1,500 to over 3,000 metres.
  - **Rivers:** The Dibang and Lohit Rivers originate here before joining the Brahmaputra. One of the biodiversity hotspots of the Eastern Himalayas.



72. Consider the following statements regarding the regions of small bodies in the Solar System.
    1. The Main Asteroid Belt is located between the orbits of Mars and Jupiter and consists primarily of rocky and metallic objects.
    2. The Kuiper Belt is a doughnut-shaped region of icy bodies lying beyond the orbit of Neptune, and it is the source of many short-period comets.
    3. The Oort Cloud is a spherical shell of icy objects surrounding the Solar System at a vast distance and is believed to be the source of long-period comets.

    Which of the statements given above are correct?

    (a) 1 and 2 only
    (b) 1 and 3 only
    (c) 2 and 3 only
    (d) 1, 2 and 3

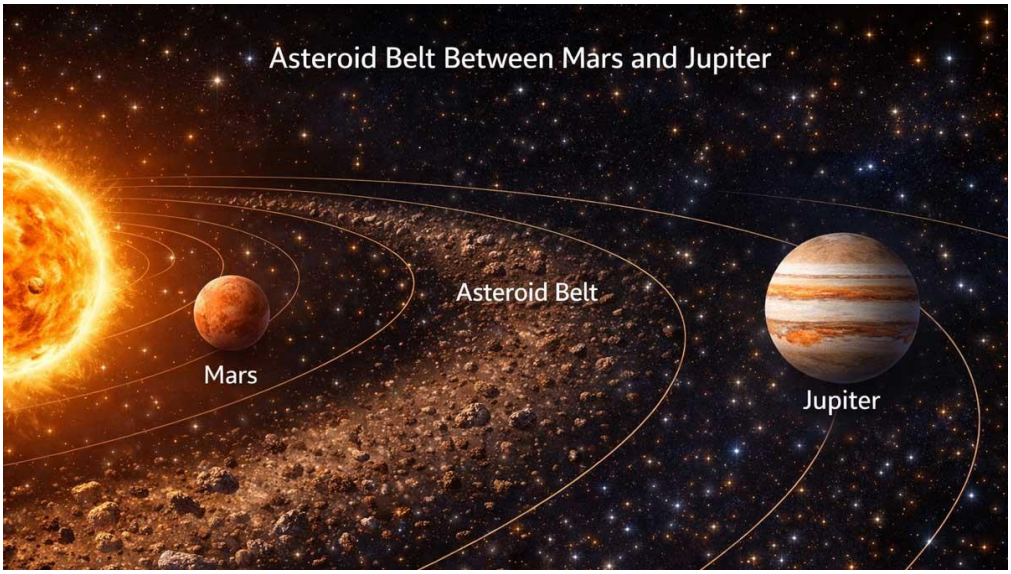
EXPLANATION:

Main Asteroid Belt:

- The majority of known asteroids orbit within the asteroid belt between Mars and Jupiter, generally with not very elongated orbits.

- The belt is estimated to contain between 1.1 and 1.9 million asteroids larger than 1 kilometre (0.6 miles) in diameter, and millions of smaller ones.
- Early in the history of the solar system, the gravity of newly formed Jupiter brought an end to the formation of planetary bodies in this region and caused the small bodies to collide with one another, fragmenting them into the asteroids we observe today.
  - Most of the asteroids in the main belt are made of rock and stone, but a small portion of them contain iron and nickel metals.
  - The remaining asteroids are made up of a mix of these, along with carbon-rich materials.
  - Some of the more distant asteroids tend to contain more ice. Although they aren't large enough to maintain an atmosphere, there is evidence that some asteroids contain water.

Thus, the Main Asteroid Belt lies between Mars and Jupiter and contains mostly rocky and metallic bodies. **So, Statement 1 is correct.**



The Kuiper Belt is a **doughnut-shaped region** of icy objects beyond the orbit of Neptune. It is home to Pluto and most of the known dwarf planets and some comets. It's sometimes called the **"third zone"** of the solar system.

- In addition to rock and water ice, objects in the Kuiper Belt also contain a variety of other frozen compounds like ammonia and methane.
- Similar to the asteroid belt, the Kuiper Belt is a region of leftovers from the solar system's early history. Like the asteroid belt, it has also been shaped by a giant planet, although it's more of a thick disk (like a doughnut) than a thin belt.
- There are two types of comets based on orbital periods: **Short-period comets** take less than 200 years, and **long-period comets** take over 200 years, with some taking 100,000 to 1 million years to orbit the Sun.
  - The short-period comets are found near the ecliptic, which means they are orbiting the Sun in the same plane as the planets. The short-period comets are thought to originate in the Kuiper Belt, an area outside Neptune's orbit (from about 30 to 50 AU).

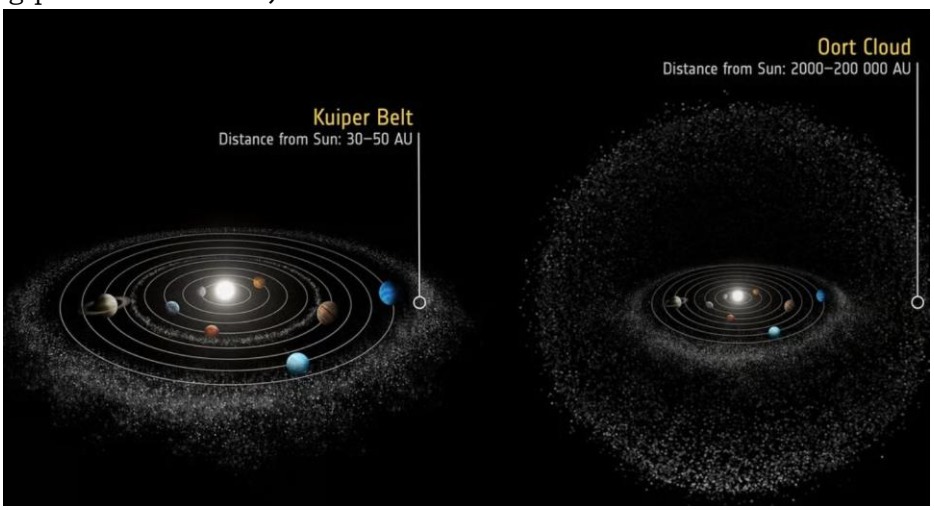
Thus, the Kuiper Belt is a doughnut-shaped region beyond Neptune and is the source of many short-period comets. **So, Statement 2 is correct.**

In 1950, astronomer Jan Oort proposed that some comets come from a vast, extremely distant spherical shell of icy bodies surrounding the solar system. This giant swarm of objects, now named the Oort Cloud, occupies space at a distance between 5,000 and 100,000 astronomical units.

- Most known long-period comets have been seen only once in recorded history because their orbital periods are so, well, long.

- The long-period comets tend to have orbits that are randomly oriented, and not necessarily anywhere near the ecliptic. They are thought to originate in the Oort cloud. The Oort cloud has never been observed, but is believed to have at least 1012 icy objects located between 3000 AU and 100,000 AU in a spherical distribution around the Sun.

Thus, the Oort Cloud is a distant spherical shell surrounding the Solar System and is believed to be the origin of long-period comets. **So, Statement 3 is correct.**



73. There is greater soil thickness in the Taiga than in the Hot Deserts. Why?

(a) Taiga has moderate precipitation
(b) Taiga has lower humus
(c) Hot Deserts have higher temperature
(d) Taiga has lower precipitation

EXPLANATION:

The soil in the Taiga is shaped by **precipitation, cold temperatures, slow decomposition, and glacial history**. It is often described as acidic, nutrient-poor, and frozen, making it a challenging foundation for any ecosystem.

- One of the most distinctive features of Taiga soil is the presence of permafrost, especially in northern Canada, Siberia, and areas east of the Ural Mountains.
- Permafrost refers to ground that remains frozen for two or more consecutive years.
- Only the active layer, a shallow surface zone, thaws during summer, which severely limits root growth and nutrient cycling.
- Because of this, the soil tends to be poorly drained and prone to frost heaving.

Organic Matter and Humus Formation:

- The Taiga has dense coniferous forests, which produce leaf litter (needles), roots, and organic debris.
- This adds humus to the soil, increasing its thickness.
- In contrast, hot deserts have sparse vegetation, so very little organic matter is added to the soil.

Weathering and Soil Formation:

- In the Taiga, moderate precipitation (rain and snow) and relatively low temperatures allow chemical and physical weathering of rocks to occur steadily over time, forming soil layers.
- In hot deserts, rainfall is extremely low, so weathering is minimal.
- Without sufficient water, rocks do not break down into soil as effectively.

Therefore, there is greater soil thickness in the Taiga than in the hot deserts because the Taiga climatic region receives more precipitation, which aids weathering of rocks and soil formation.

So, Option (a) is correct.

TAIGA SOIL V/S DESERT SOIL

74. With reference to the doctrine of reasonable classification under Article 14, consider the following statements:
    1. A classification is valid only if it is based on an intelligible differentia that distinguishes persons or things grouped together from others left out of the group.
    2. Such differentia must have a rational nexus with the object sought to be achieved by the law.

    Which of the statements given above is/are correct?
    (a) 1 only
    (b) 2 only
    (c) Both 1 and 2
    (d) Neither 1 nor 2

EXPLANATION:

Article 14 of the Constitution **permits reasonable classification**. A classification is valid only when it is based on an intelligible differentia, which distinguishes persons or things that are grouped together from those left out of the group.

- Intelligible differentia refers to grouping individuals with common characteristics, making them distinct from others. The classification must not be arbitrary, artificial, or evasive, and should follow a definite and logical basis.
- There can be different bases of classification, such as geographical factors, historical context, nature of persons, or educational qualifications.

Example: The Child Labour (Prohibition and Regulation) Act, 1986, applies only to children below 14 years, distinguishing them from those above 14 years, thereby forming a valid classification based on age. **So, Statement 1 is correct.**

- The classification must have some basis, i.e. must be founded on an intelligible differentia which distinguishes persons or things that are grouped together from others left out of the group.
- The differentia must have a nexus with the object sought to be achieved by the statute in question. **So, Statement 2 is correct.**

75. Match List I with List II and select the correct answer using the code given below:

	List I (Cases)		List II (Principles / Outcomes)
A.	Maneka Gandhi v. Union of India Case, 1978	1.	Right to life includes due process and procedural fairness.
B.	ADM Jabalpur v. Shivkant Shukla Case, 1976	2.	Habeas Corpus is not maintainable during an Emergency.
C.	Indira Nehru Gandhi v. Raj Narain Case, 1975	3.	Application of basic structure doctrine to election disputes.
D.	M.C. Mehta v. Union of India Case, 1986	4.	Development of environmental jurisprudence and absolute liability.

Select the correct option using the codes given below:

(a) A–1, B–2, C–3, D–4

(b) A–2, B–1, C–3, D–4

(c) A–1, B–3, C–2, D–4

(d) A–1, B–2, C–4, D–3

EXPLANATION:

1978 – Maneka Gandhi v. Union of India: overruled A.K. Gopalan v State of Madras.

- It Held that "**procedure established by law" must be fair, just, and reasonable**.
- The right to travel abroad was held to be included within the right to personal liberty.
- Article 21 was interpreted not merely as a negative restriction on State action but as a recognition of the broad scope of personal liberty it protects.
- Any restriction on rights under **Article 21 must also satisfy the tests of fairness and reasonableness under Articles 14 and 19**. **(A-1)**

1976 – ADM Jabalpur v. Shivkant Shukla:

- The Supreme Court, in a 4:1 majority, held that **no person has any locus to claim protection under Article 21 during the operation of an Emergency under Article 359, even in cases of illegal detention** (Habeas Corpus).
- The majority ruled that Fundamental Rights are not absolute and can be restricted to balance competing claims.
- The Court observed that exceptional circumstances permit the exercise of extraordinary powers, and at times, individual liberty may have to yield to the broader interests of the State.
- Justice H.R. Khanna, in his famous dissent, held that the right to life is not a gift of the Constitution and cannot be suspended. **(B-2)**

1975- Indira Nehru Gandhi v. Raj Narain: is the **reaffirmation and expansion of the Basic Structure Doctrine.**

- The case was significant due to its unprecedented nature and political implications, raising questions about the balance of power between Parliament and the Judiciary, particularly attempts to assert parliamentary supremacy.
- It also marked a major constitutional milestone, as it was the first time after independence that the election of a Prime Minister was declared void.
- Further, it represented the first application of the Basic Structure Doctrine (evolved in Kesavananda Bharati v. State of Kerala, 1973) to strike down a Constitutional Amendment.
- The case also led to retrospective amendments in election laws to validate the Prime Minister's election and is widely regarded as a major factor contributing to the declaration of the National Emergency (1975–1977). (**C-3)**

1986- M.C. Mehta v. Union of India: became a landmark judgment in environmental activism in India. The case is significant in several respects.

- The judgment, delivered in the backdrop of the Bhopal Gas Disaster (1984), expanded the scope, extent, and application of environmental laws in India.

- It also broadened the interpretation of Article 21 (right to life and personal liberty) and Article 32 (right to constitutional remedies).
- The case examined key legal issues and laid down important legal principles, contributing significantly to the development of environmental jurisprudence in India.
- The case is important mainly because it initiated the rule of absolute liability. **(D-4)**

Here, the correct sequence is A–1, B–2, C–3, D–4. **So, Option (a) is correct.**

76. The Motion of Thanks in the Parliament of India is associated with which of the following?
    1. The President's Address to Parliament
    2. Passage of the Annual Financial Statement

    Which of the statements given above is/are ***not*** correct?
    (a) 1 only
    (b) 2 only
    (c) Both 1 and 2
    (d) Neither 1 nor 2

EXPLANATION:

The first session after each general election and the first session of every fiscal year is addressed by the President.

- In this address, the President outlines the policies and programmes of the Government in the preceding year and the ensuing year.
- This address of the President, which corresponds to the 'speech from the Throne in Britain', is discussed in both the Houses of Parliament on a motion called the **'Motion of Thanks'.**
- At the end of the discussion, the motion is put to a vote. This motion must be passed in the House. Otherwise, it amounts to the defeat of the Government.
- This inaugural speech of the President is an occasion available to the members of Parliament to raise discussions and debates to examine and criticise the Government and administration for its lapses and failures.
- Thus, Motion of Thanks in the Parliament of India is associated with the President's address to Parliament. **So, Statement 1 is correct.**

The Constitution refers to the Budget as the 'annual financial statement'.

- In other words, the term 'budget' has never been used in the Constitution. It is the popular name for the 'annual financial statement' that has been dealt with in Article 112 of the Constitution.
- The President shall, in respect of every financial year, cause to be laid before both the Houses of Parliament a statement of estimated receipts and expenditure of the Government of India for that year.

Motion of Thanks in the Parliament of India is not associated with the passage of the Annual Financial Statement. **So, Statement 2 is not correct.**

77. The Industrial Relations Code (Amendment) Act, 2026, replaced which of the following Acts?
    1. Trade Unions Act, 1926
    2. Industrial Disputes Act, 1947
    3. Factories Act, 1948
    4. Industrial Employment (Standing Orders) Act, 1946

    Select the correct answer using the codes given below:
    (a) 1, 2 and 4 only
    (b) 1 and 3 only
    (c) 2 and 3 only
    (d) 1, 2, 3 and 4

EXPLANATION:

Recently, the Industrial Relations Code (Amendment) Bill, 2026, was introduced in the Lok Sabha, which seeks to amend the Industrial Relations Code, 2020, to clarify the repeal of old labour laws and avoid legal ambiguity.

- The Industrial Relations Code, 2020, deals with matters such as recognition of trade unions, notice periods for strikes and lockouts, and the resolution of industrial disputes.
- **Aim:** To prevent future legal confusion regarding the repeal of labour laws replaced by the Code.
- **Repeal of Acts:** The Code replaces the following three Acts:
  - Trade Unions Act, 1926
  - Industrial Employment (Standing Orders) Act, 1946
  - Industrial Disputes Act, 1947 **So, Statements 1, 2 and 4 are correct.**

The Industrial Relations Code (Amendment) Act, 2026, does not replace the Factories Act, 1948. **So, Statement 3 is not correct.**

78. Consider the following statements regarding the appointment of an Administrator (LG/Commissioner) for a Union Territory (UT):
    1. The President can appoint the Governor of an adjoining State as the administrator of a UT.
    2. In the UTs of Delhi and Puducherry, the LG has a wider range of discretionary powers compared to the Governor of a State.

    Which of the above given statements is/are correct?
    (a) 1 only
    (b) 2 only
    (c) Both 1 and 2
    (d) Neither 1 nor 2

EXPLANATION:

Under Article 239(2) of the Constitution, the President may appoint the Governor of a State as the administrator of an adjoining Union territory (UT), and where a Governor is so appointed, he shall exercise his functions as such administrator of the UT independently of his Council of Ministers of the concerned State. **So, Statement 1 is correct.**

The functions and powers of a Governor and a Lieutenant Governor (LG) are, more or less, the same.

- The LG, like the Governor, acts a titular head of the Union Territory. But the powers of an LG are wider than those of a Governor.
- This is because a Governor of a state under Article 163 of the Constitution has to act solely on the aid and advice of the Council of Ministers, whereas the LG does not need the approval of the Council of Ministers on every matter.
- In the case of Delhi (Article 239AA), the Government exercises no power in the domain of land, law, and police. The LG has complete discretion to decide upon any of these matters.
- Similarly, the Lieutenant Governor (LG) of Puducherry possesses discretionary powers under the Government of Union Territories Act, 1963 and Article 239A of the Constitution. While supported by a Council of Ministers, the LG acts independently on matters where the law requires discretion, particularly in cases of difference of opinion with Ministers, where they must refer the matter to the President.

Therefore, the LG of Delhi and Puducherry has a wider range of discretionary powers compared to the Governor of a State. **So, Statement 2 is correct.**

79. The 'Renke Commission' (2005) and the 'Idate Commission' (2015) were primarily established to:
    (a) Review the reservation of seats for STs in the Lok Sabha.
    (b) Investigate the implementation of the Forest Rights Act in North-East India.
    (c) Analyse the impact of GST on the handicraft products of tribal artisans.
    (d) Identify and prepare a state-wise list of De-notified, Nomadic, and Semi-Nomadic Tribes.

EXPLANATION:

The Ministry of Social Justice and Empowerment had constituted the ***Renke Commission*** (National Commission for De-notified, Nomadic and Semi-Nomadic Tribes) in March 2005 to examine issues relating to De-notified, Nomadic and Semi-Nomadic Tribes.

- The Commission submitted its report in July 2008. The Commission was tasked with preparing state-wise lists of De-notified Tribes (DNTs), Nomadic Tribes (NTs) and Semi-Nomadic Tribes (SNTs), reviewing their inclusion in Scheduled Caste (SC)/Scheduled Tribes (ST)/Other Backward Classes (OBC) lists, identifying places where they live in large numbers, and evaluating welfare policies for them.

A National Commission for De-notified, Nomadic and Semi-Nomadic Tribes (NCDNT), also known as the ***Idate Commission,*** was constituted by the Government of India in February, 2014.

- The Commission has submitted its report on December 2017. The report has recommended setting up a permanent commission for Nomadic, Semi-Nomadic, and De-Notified Tribes (NTs, SNTs, and DNTs) in India.
- Its mandate included preparing a state-wise list of DNTs, NTs and SNTs. It also had to identify regions in the country with large DNT populations, evaluate the current welfare of these communities and suggest policy measures to be undertaken by state and union governments.

Therefore, both the **Renke Commission and the Idate Commission** were primarily established **to identify and prepare a state-wise list of** DNTs (De-notified Tribes), NTs (Nomadic Tribes), and SNTs (Semi-Nomadic Tribes). **So, Option (d) is correct.**

80. With reference to the Law Officers of the Union of India, consider the following statements:
    1. The Attorney General for India is not permitted to advise or appear against the Government of India in any case.
    2. The Solicitor General of India and Additional Solicitors General are appointed by the Appointments Committee of the Cabinet.
    3. The Attorney General is entitled to all the privileges and immunities available to a Member of Parliament while participating in parliamentary proceedings.

    Which of the statements given above is/are correct?

    (a) 2 and 3 only
    (b) 1 and 2 only
    (c) 3 only
    (d) 1, 2 and 3

EXPLANATION:

The Constitution (Article 76) has provided for the office of the Attorney General for India. He/she is the highest law officer in the country.

In the performance of his/her official duties, the Attorney General has the right of audience in all courts in the territory of India.

In order to avoid any complication and conflict of duty, the following limitations are placed on the Attorney General:

- **He/she should not advise or hold a brief against the Government of India**. **So, Statement 1 is correct.**
- He/she should not advise or hold a brief in cases in which he/she is called upon to advise or appear for the Government of India.
- He/she should not defend accused persons in criminal prosecutions without the permission of the Government of India.
- He/she should not accept appointment as a director in any company or corporation without the permission of the Government of India.

- He/she should not advise any ministry or department of the Government of India or any statutory organisation or any public sector undertaking unless the proposal or a reference in this regard is received through the Ministry of Law and Justice, Department of Legal Affairs.

In addition to the Attorney General, there are other law officers of the Government of India.

- They are the solicitor general of India and additional solicitor general of India. They assist the AG in the fulfilment of his/her official responsibilities.
- It should be noted here that only the office of the AG is created by the Constitution. In other words, **Article 76 does not mention the solicitor general and the additional solicitor general.**
- Solicitor General of India is subordinate to the Attorney General of India. Solicitor General of India is not a Constitutional Post (as it is not mentioned in our Constitution). It is a statutory Post established by an act of Parliament.
- The Solicitor General is the secondary lawyer of the Government of India in the Supreme Court. He is also known as second Lawyer of India. Like the Attorney General, the Solicitor General too advices Government of India on Legal issues & appears in the Supreme Court on behalf of the Government of India.
- Both the Solicitor General and Additional Solicitors General are appointed by the Appointments Committee of the Cabinet. **So, Statement 2 is correct.**

To carry out responsibilities effectively as the chief legal advisor, the Attorney General of India is granted specific rights and privileges under the Constitution, particularly Articles 76 and 88.

- **Right of audience:** Entitled to appear and present arguments before all courts and tribunals across India while performing official duties.
- **Parliament participation:** Can attend, speak, and take part in proceedings of both Houses of Parliament, joint sittings, and relevant committees.
- **No voting right:** Does not have the authority to vote during parliamentary proceedings.
- **Legal privileges:** Enjoys privileges and immunities similar to those granted to Members of Parliament.

Thus, the Attorney General has the right to participate in parliamentary proceedings and enjoy privileges and immunities of a Member of Parliament, though without voting rights. **So, Statement 3 is correct.**

81. The principle of 'Polluter Pays' in environmental law means:
(a) Polluters must pay a fine to the government for environmental violations.
(b) Those who produce pollution should bear the costs of managing it to prevent damage to human health and the environment.
(c) Industries must purchase pollution permits from the government before operating.
(d) Consumers of polluting products bear the cost of environmental restoration.

EXPLANATION:

The **Polluter Pays Principle** (PPP) was **formulated in 1972 by the Organisation for Economic Co-operation and Development** as a policy approach under which the polluter bears the cost of pollution.

- The 'polluter pays' principle is the commonly accepted practice that **those who produce pollution should bear the costs of managing it to prevent damage to human health or the environment.**
- For instance, a factory that produces a potentially poisonous substance as a by-product of its activities is usually held responsible for its safe disposal.
- The increasing industrialization and economic activities have significantly contributed to environmental degradation, necessitating the application of this principle.
- This principle promotes fairness and equity by ensuring that the cost of pollution control is borne by those responsible for causing pollution, rather than by taxpayers or others.
- The polluter pays principle is part of a set of broader principles guiding sustainable development worldwide (formally known as the Rio Declaration).

So, Option (b) is correct.

82. With reference to stingless bees, consider the following statements:
    1. They have not been found in India.
    2. They are considered the oldest bee species in the world.
    3. They are found in tropical regions of the world.
    4. They can aid in the pollination of cacao, coffee, and avocados.

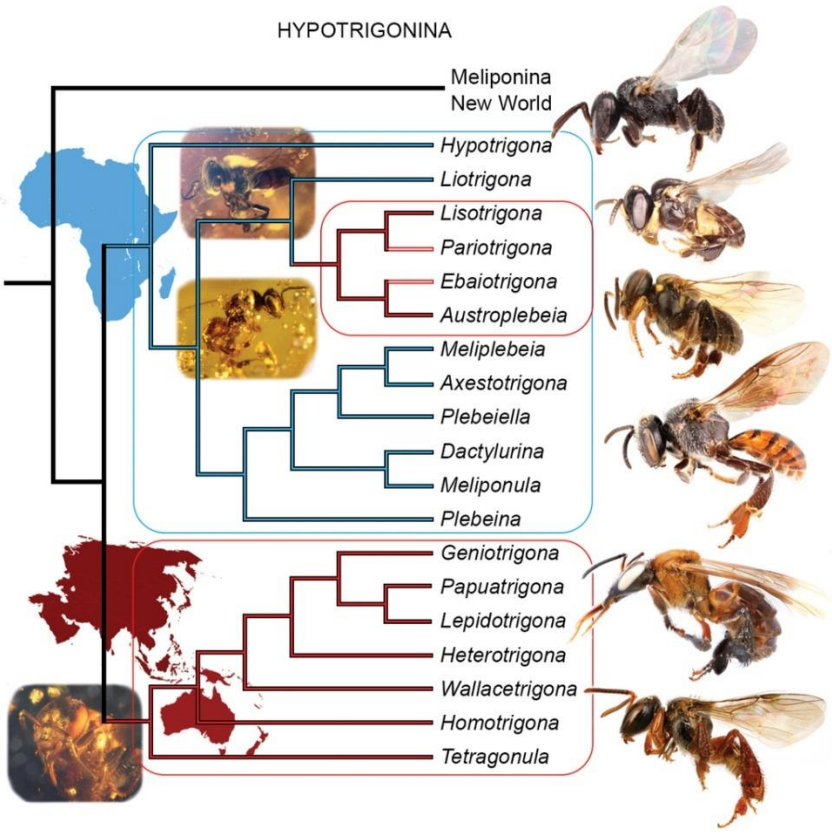
    How many of the above statements is/are correct?
    (a) Only one
    (b) Only two
    (c) Only three
    (d) All four

EXPLANATION:

Stingless bees, or Meliponini in the family Apidae, were earlier considered to be tropical bees, but some species are also found in temperate and sub-temperate regions. Of the 27 species of stingless bees identified in India. **So, Statement 1 is not correct.**

- Found in tropical regions across the world, stingless bees, a class that encompasses a number of varieties, are the oldest bee species on the planet. **So, Statements 2 and 3 are correct.**
- The stingless bees have the importance in the pollination of various food crops. About half of the world's 500 known species live in the Amazon, where they are responsible for pollinating more than 80% of the flora, including such crops as cacao, coffee and avocados. **So, Statement 4 is correct.**
- Besides true honeybees, two species of stingless or dammer bees, viz. Melipona and Trigona occur in our country in abundance.
- These bees are much smaller than the true honeybees and build irregular combs of wax and resinous substances in crevices and hollow tree trunks.
- They bite their enemies or intruders.
- They can be domesticated, but the honey yield per hive per year is only 100 gms.

Recently, in the Amazon rainforest, the stingless bees in Peru have become the world's first insects with legal rights to shield these vital pollinators from deforestation and pesticides.



83. Match the protected areas with their respective states:

	Protected Area		***State***
I.	Kaimur Wildlife Sanctuary	A.	Himachal Pradesh
II.	Kanger Valley National Park	B.	Bihar
III.	Mouling National Park	C.	Arunachal Pradesh
IV.	Inderkilla National Park	D.	Chattisgarh

Select the correct option using the codes given below:

(a) I-B, II-D, III-C, IV-A

(b) I-A, II-C, III-D, IV-B

(c) I-C, II-B, III-A, IV-D

(d) I-D, II-A, III-B, IV-C

EXPLANATION:

- **The Kaimur Wildlife Sanctuary (WLS)**, located in **southwestern Bihar**, spans over 1500 km2 and holds immense historical, cultural, socio-economic, and biodiversity significance. This sanctuary is a plateau situated between the Son River, bordering Jharkhand to the south, and the Karmanasa River, bordering Uttar Pradesh to the west. The Kaimur Hills, known for their invincibility, are home to two forts and the ancient Mundeshwari Temple, one of the oldest Hindu temples in India. **(I-B)**
- **The Kanger Valley National Park (KVNP)**, located in **Jagdalpur within the Bastar District of Chhattisgarh**, India. The park draws its name from the Kanger River, meandering from the northwest to the southeast. The entire National Park is full of seasonal and perennial streams which joins the Kanger River. **(II-D)**
- **Mouling National Park** is in **Arunachal Pradesh**. It is located on the right bank of the river Siang, covering an area of 483 Sq km. Ornamental plants like foxtail and orchids are abundant in this area. Many endangered species like takins, snowclouded leopard, golden languor, hornbill, monal scalater and serow are spotted here. **(III-C)**
- **Inderkilla National Park** is located in the **Kullu district of Himachal Pradesh**. The Beas River flows through Inderkilla National Park, originating from Beas Kund, a glacial lake situated near the Rohtang Pass in the Himalayas. **(IV-A)**

So, Option (a) is correct. I-B, II-D, III-C, IV-A

84. With reference to biomaterials, consider the following statements:

1. They can be chemically identical to petroleum-based materials.
2. They can reduce dependence on fossil-based plastics.
3. They can aid in reducing waste generation.

Which of the statements given above is/are correct?

(a) 3 only

(b) 2 and 3 only

(c) 1 and 2 only

(d) **1, 2 and 3**

EXPLANATION:

Biomaterials are materials derived from biological sources or engineered using biological processes that are designed to replace conventional materials.

- They are increasingly used across sectors such as packaging, textiles, construction, and healthcare.
- Common examples include bioplastics made from plant sugars or starch, bio-based fibres used in textiles, and medical biomaterials such as biodegradable sutures and tissue scaffolds.
- Biomaterials can be broadly categorised into three types:

- **Drop-in biomaterials:** which are chemically identical to petroleum-based materials and can be used in existing manufacturing systems (such as bio-Polyethylene terephthalate PET); **So, Statement 1 is correct.**
- **Drop-out biomaterials:** which are chemically different and require new processing or end-of-life systems (such as polylactic acid or PLA); and
- **Novel biomaterials:** which offer new properties not found in conventional materials, such as self-healing materials, bioactive implants, and advanced composites.

Biomaterials address multiple goals, including environmental sustainability, industrial growth, revenue generation, and supporting farmer livelihoods through a single pathway.

- Indigenous biomaterials biomanufacturing can reduce dependence on fossil-based imports for plastics, chemicals, and materials. **So, Statement 2 is correct.**
- It would also enable diversified value for agricultural feedstocks and residues, offering farmers new income streams beyond food markets.
- Many biomaterials are biodegradable or compostable, helping reduce waste generation.
- Biomaterials also support domestic policy goals around waste reduction, such as the ban on single-use plastics and climate action goals. **So, Statement 3 is correct.**

Types of Biomaterials & their natural sources:

- **Cellulose-based:** Wood, cotton, hemp, bamboo
- **Protein-based:** Silk, wool, keratin, collagen
- **Polysaccharide-based:** Chitosan (from shellfish), alginate (seaweed), starch (corn, potatoes)
- **Lipid-based:** Plant oils (soybean, linseed), animal fats
- **Resin-based:** Tree saps (pine resin), shellac (from lac bug)
- **Biopolymers:** PLA (polylactic acid from corn starch), PHA (polyhydroxyalkanoates from bacterial fermentation)
- **Bio-composites:** Wood plastic composites, flax or hemp fibers in polymer matrix
- **Natural rubber:** Rubber tree (Hevea brasiliensis)

85. With reference to red pandas, which one of the following statements is ***not*** correct?
(a) They are nocturnal.
(b) They feed predominantly on bamboo.
(c) Their gestation period is about twelve months.
(d) They are found in mixed deciduous forests.

EXPLANATION:

The red panda is a small arboreal mammal found in the forests of India, Nepal, Bhutan, and the northern mountains of Myanmar and southern China. It **thrives best at 2,200–4,800 m in mixed deciduous and coniferous forests** with dense understories of bamboo. **So, Option (d) is correct.**

- The red panda prefers a **solitary and nocturnal lifestyle.** It is mainly active during the twilight period and until the early hours of the morning. During daylight hours, it can be found resting on tree branches, either curled up or lying dangled depending on the weather. **So, Option (a) is correct.**
- **Bamboo constitutes about 95% of the red panda's diet**. Unlike giant pandas that feed on nearly every above-ground portion of bamboo, red pandas feed selectively on the most nutritious leaf tips and, when available, tender shoots. **So, Option (b) is correct.**
- The red panda gives birth to one to four cubs after a **gestation period of 98 to 145 days**. Thus, their gestation period is not twelve months. **So, Option (c) is not correct.**

86. Consider the following statements:
1. United Nations Office for Disaster Risk Reduction
2. International Telecommunication Union
3. International Federation of Red Cross and Red Crescent Societies
4. World Meteorological Organisation

How many of the above Organisations is/are part of the Early Warnings for All (EW4All) initiative?
(a) Only one
(b) Only two
(c) Only three
(d) All four

EXPLANATION:

The Early Warnings for All (EW4All) initiative aims to ensure universal protection from hazardous hydrometeorological, climatological and related environmental events through life-saving multi-hazard early warning systems, anticipatory action and resilience efforts by the end of 2027.

The four pillars of Early Warnings for All:

The Early Warnings for All initiative are built on four pillars to support countries in building and operating effective and inclusive multi-hazard early warning systems:

- **Disaster risk knowledge:** Collecting data and undertaking risk assessments to increase knowledge on hazards and vulnerabilities, and trends, led by the United Nations Office for Disaster Risk Reduction (UNDRR). **So, Statement 1 is correct.**
- **Detection, observation, monitoring, analysis, and forecasting:** Developing hazard monitoring and early warning services, led by the World Meteorological Organisation (WMO). **So, Statement 4 is correct.**
- **Warning dissemination and communication:** Communicating risk information to all those who need it, led by the International Telecommunication Union (ITU). **So, Statement 2 is correct.**
- **Preparedness and response capabilities:** Building national and community response capabilities, led by the International Federation of Red Cross and Red Crescent Societies (IFRC). **So, Statement 3 is correct.**

87. Consider the following statements regarding groundwater in India:
1. A major portion of groundwater extracted in India is used for irrigation.
2. Over-exploitation of groundwater is governed primarily under the Water (Prevention and Control of Pollution) Act, 1974.
3. The National Aquifer Mapping Programme (NAQUIM) is implemented by the Central Ground Water Board.

Which of the statements given above are correct?

(a) 1 and 3 only

(b) 2 and 3 only

(c) 1 and 2 only

(d) 1, 2 and 3

EXPLANATION:

Groundwater is the water that seeps through rocks and soil and is stored below the ground.

- The rocks in which groundwater is stored are called aquifers.
- In India, the availability of surface water is greater than groundwater.
- However, owing to its decentralised availability, groundwater is easily accessible and forms the largest share of India's agriculture and drinking water supply.
- About **89% of groundwater extracted is used for irrigation**, making it the highest category of use in the country.
- The main means of irrigation in the country are canals, tanks, and wells, including tube-wells. Of these, groundwater constitutes the largest share. **So, Statement 1 is correct.**

The **Central Ground Water Authority** (CGWA) has been constituted under the Ministry of Jal Shakti for the **regulation and control of groundwater abstraction**.

- Although water is a State subject, groundwater regulation is carried out at both Central and State levels.
- **CGWA was constituted** in January 1997 **under the Environment Protection Act, 1986**, following the directions of the Supreme Court of India.
- It is responsible for regulating and controlling groundwater development and management and issuing necessary directions.
- Groundwater regulation in India remains fragmented, with primary control at the State level and guidelines issued by CGWA.
- There is no single comprehensive national law specifically governing groundwater over-exploitation. **So, Statement 2 is not correct.**

National Aquifer Mapping Programme(NAQUIM) was initiated by **Central Ground Water Board**, Ministry of Jal Shakti, Government of India with a vision to identity and map the aquifers with their characteristics, to quantify the available groundwater resources, propose plans appropriate to the scale of demand and supply in order to formulate a viable strategy for the sustainable development and management of ground water resources. **So, Statement 3 is correct.**

88. Consider the following:

1. Per capita GSDP distance
2. Demographic performance
3. Forest
4. Contribution to GDP
5. Tax and fiscal efforts
6. Population (1971)

Which of the criteria given above are used by the Sixteenth Finance Commission as part of horizontal tax devolution?

(a) 1, 2, 3 and 4 only

(b) 5 and 6 only

(c) 1, 2, 3, 4 and 5 only

(d) 1, 2, 3, 4, 5 and 6

EXPLANATION:

The Finance Commission (FC) is a Constitutional body constituted by the President every five years to make recommendations on centre-state fiscal relations.

The Report of the 16th Finance Commission was tabled in Parliament on February 1, 2026, for the five-year period between 2026-27 and 2030-31.

Criteria for horizontal tax devolution to states: To provide for the distribution of central taxes among states, Finance Commissions define a formula with weightage for certain parameters.

Per Capita Gross State Domestic Product (GSDP) Distance (Income Distance):

- The 16th FC has defined income distance as the difference between the per capita GSDP of a state and the average of the per capita GSDP of the top three large states with the highest per capita GSDP. **So, Statement 1 is correct.**
  - Per capita GSDP has been computed as the average over the period 2018-19 and 2023-24, excluding the pandemic year of 2020-21.
  - States with a lower per capita GSDP will receive a higher share of this parameter to maintain equity among states.

Demographic Performance:

- The 15th FC introduced this parameter to award states for controlling population on the basis of Total Fertility Rate (TFR).
- The 16th FC has redefined this to account for population growth between 1971 and 2011 instead of relying on the change in TFR.
- States with lower population growth will have a higher share under this parameter. **So, Statement 2 is correct.**

Forest:

- The 16th FC has assigned weightage to both the share of a state in the overall forest area and its share in the increase in overall forest area between 2015 and 2023.
- Further, it has also considered open forests in arriving at the total forest area. In contrast, the 15th FC had considered only dense and moderately dense forests and defined the parameter only in terms of the share in the overall forest area. **So, Statement 3 is correct.**

Contribution to GDP:

- The 16th FC has introduced this parameter to account for the contribution to national GDP. **So, Statement 4 is correct**
- This **replaces the tax and fiscal efforts parameter** used by the 15th FC, which rewarded states with a higher tax collection efficiency. **So, Statement 5 is not correct.**
- Contribution to GDP by a state is calculated as the squared root of its GSDP to the sum of squared root of GSDP of all states.
- GSDP of each state has been measured as the average nominal GSDP between 2018-19 and 2023-24 (excluding the pandemic year of 2020-21).

Grants-in-aid:

- The 16th FC has recommended grants worth Rs 9.47 lakh crore over the five-year period.
- These comprise grants for: (i) urban and rural local bodies, and (ii) disaster management.
- The 16th FC has discontinued the following grants recommended by the 15th FC:
  - Revenue deficit grants,
  - Sector-specific grants, and
  - State-specific grants.
- **Population**: On this parameter, the share in devolution is determined based on the share in the population as per the **2011** Census. **So, Statement 6 is not correct.**

Criteria for distribution of central taxes among states

Criteria	15th FC (2021–26)	16th FC (2026–31)
Income Distance	45%	42.5%
Population (2011)	15%	17.5%
Demographic Performance	12.5%	10%
Area	15%	10%

Forest	10%	10%
Tax and Fiscal Efforts	2.5%	—
Contribution to GDP	—	10%
Total	**100%**	**100%**

89. Which of the following best describes the term biflation?
(a) A scenario of two continuous quarters of excessive inflation in an economy.
(b) A situation where inflation and deflation occur simultaneously within an economy.
(c) A scenario of two continuous months of subdued price levels in an economy.
(d) A phenomenon where two trading partners have identical levels of inflation.

EXPLANATION:

Biflation describes a **situation where inflation and deflation occur simultaneously within an economy**; some prices rise while others fall.
- It occurs when central banks use expansionary monetary policy during recessions.
- Biflation often results in higher commodity prices and falling debt-based asset prices.
- The phenomenon is linked to the Cantillon effect, where monetary changes impact prices unevenly.
- Biflation was observed during the 2007–2009 Great Recession, affecting various markets differently.
- It arises during debt deflation when central banks inject money to raise asset prices, but the newly created money is often used to purchase commodities and related assets rather than offset deflation in debt markets. **So, Option (b) is correct.**

90. Consider the following statements regarding the Income Tax Act, 2025:
1. It simplifies tax terminology with the introduction of a concept called the Tax Year
2. It authorises the Central Government to design new schemes for improving efficiency, transparency and accountability in tax administration.
3. It introduces a more robust and taxpayer-friendly framework for dispute resolution

Which of the above given statements are correct?
(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2 and 3

EXPLANATION:

The Income Tax Act, 2025 introduces a streamlined and modernized framework for direct taxation in India. It focuses on clarity, simplification, and improved compliance through structural and procedural reforms. The Act is designed to enhance transparency, reduce litigation, and align with technological developments.

Simplification of Tax Terminology:
- The Act simplifies tax terminology by replacing the previously used terms "Assessment Year" and "Previous Year" with a single concept called the "Tax Year."
- It is defined as the twelve-month period of the financial year commencing on 1st April.
- This change improves clarity and reduces ambiguity in compliance and interpretation. **So, Statement 1 is correct.**

Administrative Reforms and Governance: The Act authorizes the Central Government to design new schemes to improve efficiency, transparency, and accountability in tax administration. **So, Statement 2 is correct.**

This can be done by:

- Eliminating the interface with the assessee or any other person to the extent technologically feasible
- Optimising utilisation of resources through economies of scale and functional specialisation

Dispute Resolution Framework: The Act introduces a more robust and taxpayer-friendly framework for resolving disputes. **So, Statement 3 is correct.**

91. Which of the following is an asset of a bank?
(a) Term deposits of households with maturity greater than one year
(b) Loans given to commercial enterprises
(c) Certificate of Deposits issued
(d) Foreign Currency Non-Resident deposits

EXPLANATION:

In simple terms, assets are what a company owns, and liabilities are what a company owes to other parties. Assets put money into a company, whereas liabilities take money from the company. Assets increase the value of a company's equity while liabilities decrease it.
Assets and liabilities are fundamental concepts in accounting and finance.

- They are both vital components that determine the financial stability of an individual or a company.
- In layman's language, assets are anything a firm owns and has value, while liabilities are something the company owes to others.
  Commercial banks use the capital generated from deposits to offer loans and advances to individuals and businesses.
- These are recorded as assets on the bank's balance sheet.
- They make money by lending to borrowers at a higher interest rate than they offer to depositors.
- These loans come in different forms, such as consumer loans, mortgages, working capital loans, such as credit lines or bank overdrafts, equipment financing for purchasing fixed assets, etc.

For a bank:
Assets are what the bank owns or is owed (things that generate income).
Liabilities are what the bank owes to others (like deposits).

- Term deposits of households → Liability (bank has to repay depositors)
- Loans given to commercial enterprises → Asset (bank earns interest on these loans). **So, Option (b) is correct.**
- Certificates of Deposit issued → Liability (bank must repay investors)
- Foreign Currency Non-Resident deposits → Liability (money owed to depositors)

92. Consider the following statements with respect to the recently released new series of national account estimates in India:
1. The base year has been revised to Financial Year 2022-23.
2. The practice of estimating quarterly national accounts has been replaced by half-yearly national accounts.
3. Mining and quarrying have been reclassified as secondary economic activities.

How many of the statements given above is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

EXPLANATION:

Recently the **Ministry of Statistics and Programme Implementation** (MoSPI) released the New Series of Annual and Quarterly National Accounts Estimates with base year 2022–23, which replaces the previous series with base year of 2011–12. **So, Statement 1 is correct.**

- **National Account Statistics** is a comprehensive source of data on national income, production, and expenditure aggregates of the economy.

- It provides a granular and structured view of economic data through organized statistical statements.
- It serves as a key statistical input for understanding and evaluating the performance and structural changes of the economy.
- In case of base year revisions, changes are made to:
  - Capture structural changes in the economy
  - Incorporate latest data sources
  - Improve estimation methodologies
  - Enhance coverage and accuracy

Based on recent 2026 updates, the practice of estimating quarterly national accounts in India has not been replaced by half-yearly accounts.
Instead, India has updated its GDP series to a new base year of 2022–23, maintaining rigorous quarterly estimations (QNA) that follow IMF standards, while improving data sources like GST and MCA-21 (e-Governance initiative of Ministry of Corporate Affairs (MCA)). **So, Statement 2 is not correct.**

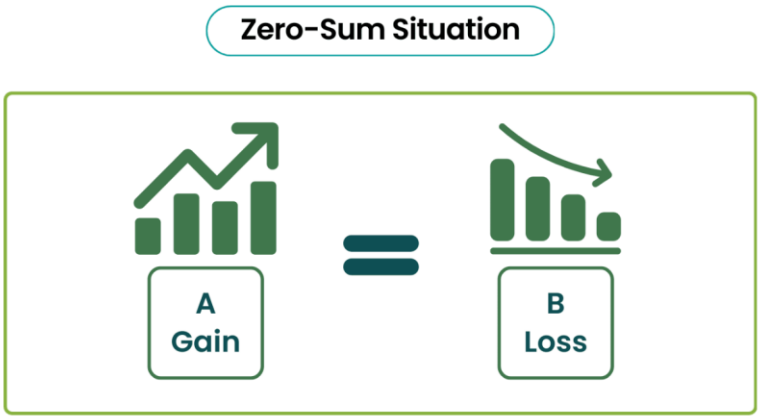
The following are the three major sectors that are classified based on the nature of economic activity:
- **Primary Sector:** Agriculture, Livestock, Forestry & Fishing, and Mining & Quarrying
- **Secondary Sector:** Manufacturing; Electricity, Gas, Water Supply & Other Utility Services; and Construction
- **Tertiary Sector:** Trade, Hotels, Transport, Communication and Services related to Broadcasting and Storage; Financial, Real Estate, IT & Professional Services; Ownership of Dwellings; and Public Administration, Defence & Other Services

Thus, Mining and quarrying are classified under the Primary sector, not the Secondary sector. **So, Statement 3 is not correct**

93. A zero-sum game can be best described as a situation where
(a) gains of one party in a transaction result in an equivalent loss to the other party.
(b) both parties in a transaction make equivalent gains.
(c) both parties in a transaction make zero gains.
(d) gains of one party in a transaction are attained without affecting the other party.

EXPLANATION:

A **zero-sum game** is any interaction where **one person's gain results in an equivalent loss to another participant**.
- This concept suggests that resources are finite, and individuals or groups are in constant competition for them—be it money, power, or status.
- In such a scenario, the total gains and losses for all players equal zero; hence, one's victory inherently means another's defeat.
- The concept of a zero-sum game is prominent in game theory. Chess is an example of a zero-sum game, where one person wins at the expense of another.
- Some transactions in financial markets are also zero-sum games, such as trading in options and futures.
- Every contract is an agreement between two parties, where one party gains and the other loses.
- Assets can be bought and sold among investors, redistributing wealth without increasing the total. **So, Option (a) is correct.**



94. With reference to the Basic Animal Husbandry Statistics 2025, consider the following information:

Sl. no.	***Product***	***Largest producer***
1.	Milk	Uttar Pradesh
2.	Meat	Kerala
3.	Egg	Andhra Pradesh
4.	Wool	Rajasthan

How many of the above rows is/are correctly matched?

(a) Only one
(b) Only two
(c) Only three
(d) All four

EXPLANATION:

Basic Animal Husbandry Statistics–2025 publication is primarily based on the findings of the Integrated Sample Survey. The primary objective of the Integrated Sample Survey (ISS) is to generate animal-wise estimates of the four major livestock products, i.e. milk, eggs, meat, and wool, at both all-India and State/UT levels.

Milk Production: ***India ranks 1st globally*** in milk production. The total Milk production in the country is estimated as 247.87 million tonnes during 2024-25. Production has increased from 239.30 million tonnes in 2023-24, registering a growth of 3.58% % in 2024-25 over the previous year. The Per Capita Availability has increased from 319 gm/ day in 2014-15 to 485 gm /day in 2024-25.

- The top 5 milk-producing states are: ***Uttar Pradesh (15.66%),*** Rajasthan (14.82%), Madhya Pradesh (9.12%), Gujarat (7.78%), and Maharashtra (6.71%).
- The top 5 states together contribute 54.09 % of the total Milk production in the country. **So, Pair (1) is correct.**

Meat Production: India ranks 4th ***globally*** in meat production. The total Meat production in the country is estimated as 10.50 million tonnes during 2024-25, and registered a growth of 2.46 % the production increased over 2023-24. The meat production from poultry is 5.18 million tonnes, contributing about half of the total meat production.

- The ***top five meat-producing states*** are ***West Bengal (12.46%)***, Uttar Pradesh (12.20%), Maharashtra (11.57%), Andhra Pradesh (10.84%), and Telangana (10.49%). Kerala is not the largest meat-producing state.
- Together, they contribute 57.55% of the total meat production in the country. **So, Pair (2) is not correct.**

The ***total Egg production*** in the country is estimated as 149.11 billion nos. during 2024-25 and registered a growth of 4.44%. The production has increased annually by 3.18% during 2023-24. The per capita availability of eggs increased from 62 nos/annum in 2014-15 to 106 nos/annum in 2024-25.

- The ***major contribution*** to the ***total Egg production*** comes from ***Andhra Pradesh with a share of (18.37 %)*** of total Egg production, followed by Tamil Nadu (15.63 %), Telangana (12.98%), West Bengal (10.72%) and Karnataka (6.67 %). **So, Pair (3) is correct.**
- Collectively, these states contribute 64.37% of India's total egg production, underscoring their crucial role in the country's poultry sector.

The total ***Wool production*** in the country is estimated as 34.57million kg during 2024-25, which registered a notable increase of 2.63 % over the last year.

- The ***Major contribution*** in the ***total Wool production*** comes from ***Rajasthan with a share of 47.85%,*** followed by Jammu & Kashmir (22.88%), Gujarat (6.22%), Maharashtra (4.75%) and Himachal Pradesh (4.30%). **So, Pair (4) is correct.**
- Together, these states account for a substantial 85.98% of the nation's total wool output, highlighting their significant role in India's wool industry.

95. Which of the following was a major export item of India during the financial year 2025-26?
(a) Petroleum crude
(b) Gold
(c) Fertilizers
(d) Petroleum products

EXPLANATION:

In FY25, the export composition was **predominantly concentrated in petroleum products, telecom instruments, drug formulations, and biologicals**. Collectively, these sectors accounted for approximately a quarter of total exports.

- The top Export products from India in 2025 include Engineering Goods, Petroleum Products, Electronic Goods, Drugs and Pharmaceuticals, and Gems and Jewellery.
- For traders, exports are essential because they boost the economy, generate jobs, and improve living conditions.
- India's major export markets are the US, the UAE, the Netherlands, China, Bangladesh, Singapore, Brazil, the UK, Saudi Arabia, Indonesia, Germany, and Hong Kong.
- India ranks second in the world for exports of refined petroleum products, making it a major producer. Liquefied petroleum gas, motor spirit, naphthas, aviation turbine fuel, superior kerosene oil, high-speed diesel, light diesel oil, LOBS/lube oil, fuel oil, and bitumen are among the top exported goods, though they vary from year to year.

Based on trade data for the financial year 2025-26, the major export item among the options provided is Petroleum products. **So, Option (d) is correct.**

India's Export Products (FY 2025–26)

S. No.	Category	Value (USD Billion)	% Share
1	Engineering Goods	$97.2B	26.50%
2	Petroleum Products	$45.7B	12.50%
3	Electronic Goods	$39.1B	10.70%
4	Drugs & Pharmaceuticals	$26.4B	7.20%
5	Gems & Jewellery	$23.5B	6.40%
6	Organic & Inorganic Chemicals	$17.3B	4.70%

7	Textiles (All)	$13.8B	3.80%
8	Rice	$9.6B	2.60%
9	Marine Products	$6.9B	1.90%
10	Meat, Dairy & Poultry	$6.1B	1.70%
11	Cotton Yarn/Fabrics	$5.8B	1.60%
12	Spices	$4.2B	1.10%
13	Coffee	$2.3B	0.60%
14	Iron Ore	$2.0B	0.50%

96. Consider the following transactions:
1. NRI Remittances
2. NRI Deposits
3. Interest received on loans given abroad
4. Profits from foreign investments
5. Foreign investment in government securities

Which of the above cross-border transactions are recorded in the current account of the Balance of Payments?
(a) 1, 2 and 3 only
(b) 1, 2, 3 and 4 only
(c) 2 and 5 only
(d) 1, 3 and 4 only

EXPLANATION:

The **Balance of payments (BOP)** is a statement of all transactions made between entities in one country and the rest of the world over a defined period such as a quarter or a year.

- The balance of payments divides transactions into the **current account** and the **capital account.**
  - The current account marks a country's incoming and outgoing goods and services.
  - The capital account notes international capital transfers, such as investments.

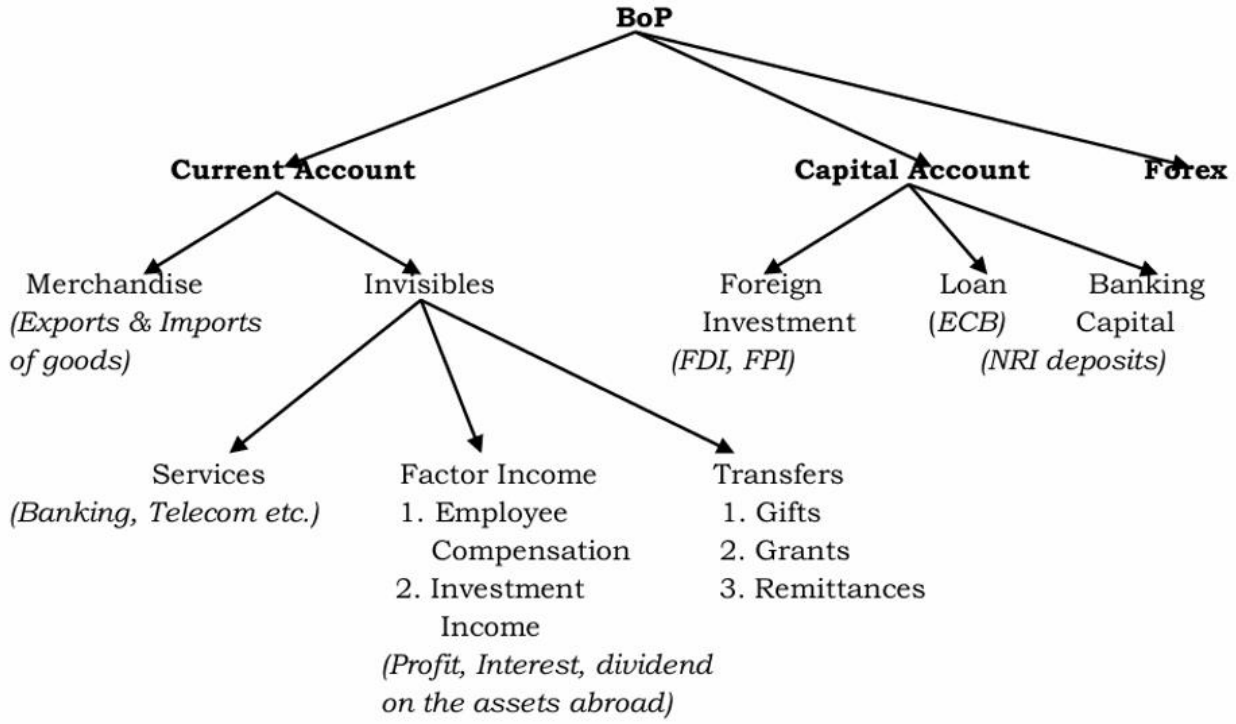
Current Account:

- A current account documents transactions of a country with the rest of the world.
- It records net trade in goods and services, net transfer payments, and net earnings on cross-border investments over a specified time.
- Current account deals in those transactions which do not alter Indian residents' assets or liabilities, including contingent liabilities, outside India and foreign residents' assets or liabilities inside India.
- The current account comprises transfer payments, which are unilateral or one-way transfers.
- It includes personal remittances, gifts and donations, charitable donations, withdrawal of NRI deposits locally, Profits from foreign investments (such as dividends, interest, and earnings), foreign aid, and others. **So, Statements 1 and 4 are correct.**
- Interest received on loans given abroad is recorded in the current account because it represents income earned from the use of capital (a factor of production), and hence falls under primary income in Balance of Payments. **So, Statement 3 is correct.**

Capital Account:

- The capital account is a record of the inflows and outflows of capital that directly affect a country's foreign assets and liabilities.
- Capital account transactions are those transactions which alter Indian residents' assets or liabilities, including contingent liabilities, outside India and foreign residents' assets or liabilities inside India.

- Capital accounts comprise foreign investments like FDI and FPI, loans by companies and governments, and banking capital such as **NRI deposits** and **foreign investment in government securities**. **So, Statements 2 and 5 are not correct.**



97. According to the 1933 Montevideo Convention on the Rights and Duties of States, consider the following criteria:
    1. Defined territory
    2. Permanent Population
    3. A government
    4. The capacity to interact with other states
    5. Sufficient resources to support the Population

    Which of the above criteria are considered to define a territory as a sovereign state?
    (a) Only two
    (b) Only three
    (c) Only four
    (d) All five

EXPLANATION:

Montevideo Convention, an agreement signed at Montevideo, Uruguay, on December 26, 1933 that established the standard definition of a state under international law.

- **According to Article 1** of the Montevideo Convention on the Rights and Duties of States, the state as a person of international law should possess the following qualifications:
- A permanent population; **So, Statement 2 is correct.**
- A defined territory; **So, Statement 1 is correct.**
- Government; **So, Statement 3 is correct.**
- Capacity to enter into relations with the other states. **So, Statement 4 is correct**.

The concept of sufficient resources to support the population is **not mentioned** in the definition of a state under the Montevideo Convention. **So, Statement 5 is not correct.**

98. Consider the following statements regarding the Food and Agriculture Organisation's (FAO) Globally Important Agricultural Heritage Systems (GIAHS):
    I. The Koraput region in Odisha, the Kuttanad farming system in Kerala, and the Saffron Heritage of Kashmir are the only three agricultural practices recognised by the FAO from India.
    II. Rashtriya Krishi Vikas Yojana and Mission for Integrated Development of Horticulture are used to support the GIAHS in India.
    III. Tajikistan became part of the Globally Important Agricultural Heritage Systems (GIAHS) network for the first time in 2025.

    Which of the statements given above are correct?
    (a) I and II only
    (b) II and III only
    (c) I and III only
    (d) I, II and III

EXPLANATION:

The Food and Agriculture Organization has recognized three Globally Important Agricultural Heritage Systems (GIAHS) sites in India:

- Koraput region (Odisha)
- Kuttanad farming system (Kerala)
- Saffron Heritage of Kashmir

➢ **The Koraput region** is known for its subsistence paddy cultivation on highland slopes and a rich diversity of paddy landraces and farmer-developed varieties, closely linked with indigenous tribal knowledge systems.

➢ **The Kuttanad farming system** is a unique below-sea-level agricultural system, consisting of wetlands for paddy cultivation and fishing, along with garden lands for coconut and other crops.

➢ **The Saffron Heritage of Kashmir** represents a traditional agro-pastoral system characterized by saffron cultivation and sustainable agricultural practices, contributing to biodiversity and soil health. **So, Statement I is correct.**

The **Globally Important Agricultural Heritage Systems (GIAHS) are** living heritage systems inhabited by communities that maintain a close relationship with their territory.

➢ These systems are characterized by agrobiodiversity, traditional knowledge, cultures, and landscapes, managed sustainably by farmers, herders, fisherfolk, and forest people.

➢ Through the Globally Important Agricultural Heritage Systems Programme, the Food and Agriculture Organization has designated 104 systems in 29 countries.

➢ The following are the Schemes and policies of Government of India that support GIAHS.

Jammu and Kashmir (Saffron Cultivation):

➢ As reported by the Government of Jammu and Kashmir, for economic revival of saffron cultivation in Jammu and Kashmir has been supported under the Rashtriya Krishi Vikas Yojana (RKVY) and Mission for Integrated Development of Horticulture (MIDH). **So, Statement II is correct.**

Odisha (Koraput Region):

➢ Government of Odisha reported that proactive steps have been taken on conserving its biodiversity, preserving landraces of different crops and branding in Koraput.

➢ The programme also incorporates community seed banks and organic farming methods, focussing on revival of neglected crops and forgotten foods.

Kerala (Kuttanad Region):

➢ As reported by the Government of Kerala, two works for the development of infrastructure in the paddy sector in the Kuttanad region are included under the current year's RKVY-DPR projects. These include:

- 'Haritam Harippad'—infrastructural development works of various Padasekharams in Alappuzha District.
- Assistance to Research on 'Ecological Utilization of Water Hyacinth (Eichhornia crassipes) in Kuttanad'.

An **integrated mountain agropastoral system** in **Tajikistan** has become the first Central Asian addition to the Globally Important Agricultural Heritage Systems, along with a **pine tree agroforestry system** and **traditional bamboo and fishery system** in the **Republic of Korea** and an **agrosilvopastoral system in Portugal**.

- In July 2025, Tajikistan's Almosi Valley was officially recognized as a GIAHS by the Food and Agriculture Organization.
- This designation marks the first GIAHS site in Central Asia and the first in any post-Soviet Commonwealth of Independent States (CIS) country. **So, Statement III is correct.**

99. With reference to the key Greenhouse Gases listed under the Paris Climate Agreement, consider the following pairs:

	GHG	Major Sources (or) Industries
I.	Nitrogen Trifluoride	Magnesium casting
II.	Sulfur Hexafluoride	Manufacturing of Semiconductors
III.	Perfluorocarbons	Aluminium production
IV.	Nitrous Oxide	Fossil fuel combustion
V.	Hydrofluorocarbons	Insulating foams

How many of the pairs given above are correctly matched?

(a) Only two
(b) Only three
(c) Only four
(d) All five

EXPLANATION:

Nitrogen trifluoride (NF3) is a potent and long-lived greenhouse gas that is widely used in the manufacture of semiconductors, photovoltaic cells, and flat panel displays, (not magnesium casting). **So, Pair (1) is not correct.**

Sulfur Hexafluoride (SF6) is increasingly utilised in the manufacturing of semiconductor devices, including integrated circuits (ICs), flat panels, photovoltaic panels, and Micro-Electro-Mechanical Systems (MEMS). Its application as an etching gas is favoured due to its density and large molecular size, making it particularly effective in flat panel and MEMS production processes. **So, Pair (2) is correct.**

Primary aluminium production is a major industrial source of **perfluorocarbons (PFCs)**, specifically tetrafluoromethane (CF4) and hexafluoroethane (C2F6). These potent greenhouse gases are emitted during "anode effects." An anode effect is a process of upset condition, where an insufficient amount of alumina is dissolved in the electrolyte bath.
This causes the voltage in the pot to be elevated above the normal operating range, resulting in the emission of gases containing the PFCs tetrafluoromethane (CF4) and hexafluoroethane (C2F6). **So, Pair (3) is correct.**

Nitrous oxide emissions are produced by both natural and human sources. Important natural sources include soils under natural vegetation and the oceans.
Natural sources create 62% of total emissions. Important human sources come from agriculture, fossil fuel combustion and industrial processes. Human-related sources are responsible for 38% of total emissions. **So, Pair (4) is correct.**

Hydrofluorocarbons (HFCs) are widely used as blowing agents in insulating foams such as polyurethane and extruded polystyrene (XPS) to create closed-cell structures that offer high thermal efficiency. While they provide low thermal conductivity, HFCs act as potent greenhouse gases with high global warming potential (GWP), leading to a phase-down under the Kigali Amendment. **So, Pair (5) is correct.**

100. The book titled 'The Sage Who Reimagined Hinduism', written by Shashi Tharoor, is associated with which one of the following?
(a) Adi Shankaracharya
(b) Sree Narayana Guru
(c) Basavanna
(d) Swami Vivekananda

EXPLANATION:

"The Sage Who Reimagined Hinduism" by Shashi Tharoor is an inspiring and in-depth **study of Narayana Guru's life,** teachings, and legacy. **So, Option (b) is correct.**

- The book highlights how he quietly reshaped Kerala's social thinking through education, reform, and an inclusive vision of faith.
- It explains complex spiritual ideas in simple language and connects them to real social struggles, especially caste oppression.

About Shree Narayana Guru:

- **Shree Narayana Guru (1856–1928)** was a respected Hindu saint and social reformer from Kerala.
- Born into an Ezhava family at a time when caste discrimination was strong, he witnessed deep social injustice.
- Known lovingly as Gurudevan, he led a powerful reform movement that challenged the caste system and promoted spiritual freedom and social equality.

Contributions:

- He was admired for his deep knowledge of the Vedas, his poetic talent, and his open and peaceful approach to change.
- He worked for the upliftment of marginalised communities by establishing temples and educational institutions.
- In doing so, he questioned harmful superstitions and reinterpreted religious traditions in a way that emphasised equality and human worth.
