

Q.1)

Ans) c

Exp) Option c is the correct answer.

Statement 1 is incorrect: Sambhar Lake, located in Rajasthan, is a saltwater lake (not a freshwater lake). This seasonal lake, along with its seasonal streams, serves as an important winter habitat and feeding ground for migratory birds, including tens of thousands of **flamingos**. **Salt production** has occurred near Sambhar for more than 1,000 years.

Statement 2 is correct: Deepor Beel, also spelled Dipor Beel, is a freshwater lake situated to the southwest of Guwahati city in Kamrup district, Assam. This **permanent freshwater lake is drained by the Brahmaputra River**. Deepor Beel is a significant natural wetland with great biological and environmental importance, acting as a major stormwater storage basin for Guwahati.

Statement 3 is correct: Lonar Lake, a crater lake, is located in Maharashtra. Formed around 52,000 years ago by a **meteorite impact on the Deccan Plateau**, it is one of the largest and most unique basalt impact craters in the world, and the **only saltwater lake in basaltic rock**.

Statement 4 is correct: Vembanad Lake in Kerala is a deep brackish water wetland with a single opening to the sea, running parallel to the Kerala coast. Its catchment area includes **four major rivers: Achankovil, Muvattupuzha, Manimala, and Meenachil**, whose upper catchments are dominated by rubber plantations.

Source: <https://www.thehindu.com/news/national/other-states/ngt-orders-rajasthan-to-ascertain-if-sambhar-festival-detrimental-to-migratory-birds-lake-habitat/article66512022.ece>

<https://www.thehindu.com/children/mystery-of-the-crater-lake/article67266105.ece#:~:text=%E2%80%9CSo%20Lonar%20Lake%20was%20created,the%20world's%20third%20largest%20crater.>

<https://www.thehindu.com/news/national/kerala/fishermen-hit-by-siltation-near-stagnation-of-vembanad-waters/article67947174.ece>

Subject:) Geography

Topic:) Rivers in India- Drainage System

Subtopic:)

Q.2)

Ans) c

Exp) Option c is the correct answer.

Pair 1 is correctly matched: Precision farming, also known as **precision agriculture**, is a modern farming management strategy that uses **data-driven technologies to improve crop and livestock production**. It aims to maximize cost-benefit and prevent waste by managing inputs on a site-specific basis. Some examples of precision agriculture technologies include Global Positioning System (GPS), Geographic Information Systems (GIS), Unmanned aerial vehicles (UAVs), Satellite remote sensing, Variable rate application (VRT), Micro irrigation (drip irrigation).

Pair 2 is correctly matched: Aquaponics is emerging as a **sustainable food production system that produces fish and plants in a closed-loop ecosystem**. Aquaponics is not dependent on soil or external environmental factors. It uses fish waste to fertilize plants and can save up to 90–95% water. In turn, the plants help to purify the water for the fish.

Pair 3 is correctly matched: Vertical farming is a method of **growing crops in vertically stacked layers in a controlled environment, such as a warehouse or skyscraper**. It uses high-tech systems and controlled-environment agriculture (CEA) technology to reduce the space needed to grow food and ensure crops

grow in a perfect microclimate. CEA technology monitors humidity, temperature, gases, and light, and farmers use artificial lighting and metal reflectors to mimic natural sunlight.

Source: <https://www.ceew.in/publications/sustainable-agriculture-india/precision-farming>

https://dof.gov.in/sites/default/files/2020-07/Aquaponics_System.pdf

<https://extension.okstate.edu/fact-sheets/hydroponics.html>

<https://aquaponics.com/aquaponics-in-schools/aquaponics-information/#:~:text=Aquaponics%20is%20a%20form%20of,the%20water%20for%20the%20fish.>

<https://www.cropin.com/vertical-farming#:~:text=Read%20on%20to%20know%20more,How%20does%20it%20work?>

Subject:) Geography

Topic:) Agriculture

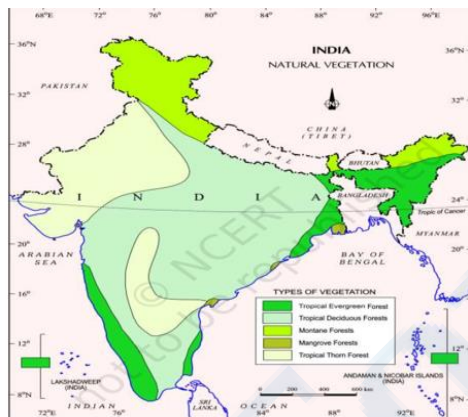
Subtopic:)

Q.3)

Ans) b

Exp) Option b is the correct answer.

The nature and extent of vegetation are primarily influenced by temperature, along with air humidity, precipitation, and soil conditions. These factors give rise to various forest ecosystems, including tropical evergreen, tropical deciduous, and temperate forests, each characterized by unique species of flora and fauna.



Option 1 is correct: Rubber is a tropical evergreen tree that are found in the regions with heavy rainfall having more than 200 cm of rainfall with a short dry season. Ideally rubber grows in the region between 10 degrees north and south of the equator where the rain fall, humidity and temperature are high, and the elevation is below 450 meters. Natural rubber is obtained from the latex of *Hevea brasiliensis*, a species of rubberwood that is native to rainforests in the Amazon region of South America, including Brazil, Venezuela, Ecuador, Colombia, Peru, and Bolivia.

Option 2 is correct: The cinchona is a large shrub or small tree found mainly in the evergreen forests and they are indigenous to South America. Its bark is renowned for its medicinal properties. The most valuable of these is **quinine, drug used to treat malaria.**

Option 3 is incorrect: The spruce (*Picea*) is an evergreen tree found mainly in the temperate forests. Spruce appears with short, blue-green, waxy leaves called needles. The waxy coating on the needles helps evergreen trees conserve water during the very cold winters. **Temperate forests** are found in the high altitude areas.

Option 4 is incorrect: Acacias is the main plant species of semi arid areas, not tropical evergreen forests. Acacia tree are distributed throughout Indian subcontinent in forest areas and agricultural lands.

The tree yields a black gum known as Amravati gum or Indian gum Arabic which is used for matches, ink paints, calico-printing.

Source: <https://ncert.nic.in/ncerts/l/iess105.pdf>

https://mdoner.gov.in/contentimages/files/9_1.pdf

Subject:) Geography

Topic:) Vegetation

Subtopic:)

Q.4)

Ans) c

Exp) Option c is the correct answer.

The Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation recently released the report on the 6th census on minor irrigation schemes. Minor Irrigation (MI) scheme is a scheme having Cultivable Command Area (CCA) of up to 2,000 hectares.

Statement 1 is correct: The information on source of energy used for operating lifting device for lifting water from the source was collected for 'in use' and 'temporarily not in use' minor irrigation schemes. Majority of these schemes (76%) utilize electricity as source of energy followed by diesel (22.2%).

Statement 2 is correct: There has been an improvement in water use efficiency and decline in wastage of water through use of improved water distribution devices over the years. During 5th MI census, 53% schemes used open channels for conveying water to the fields; this has reduced to 42% in 6th MI census. Correspondingly, the share of efficient water distribution systems like surface pipe, underground pipe, drip and sprinklers has increased. Underground pipe has recorded the highest increase followed by surface pipe and drip.

Statement 3 is incorrect: As per the report, 23.14 million minor irrigation (MI) schemes have been reported in the country, out of which 21.93 million (94.8%) are Ground Water (GW) and 1.21 million (5.2%) are Surface Water (SW) schemes.

Statement 4 is correct: Dug-wells have highest share in MI schemes followed by shallow tube-wells, medium tube-wells and deep tube-wells.

Source: <https://www.thehindu.com/news/national/electricity-powers-three-fourth-of-farmers-irrigation-sources-census-report/article67263965.ece>

<https://www.newindianexpress.com/thesundaystandard/2023/Aug/27/major-increase-in-minor-irrigation-schemes-2609014.html>

<https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1952480>

Subject:) Geography

Topic:) Agriculture

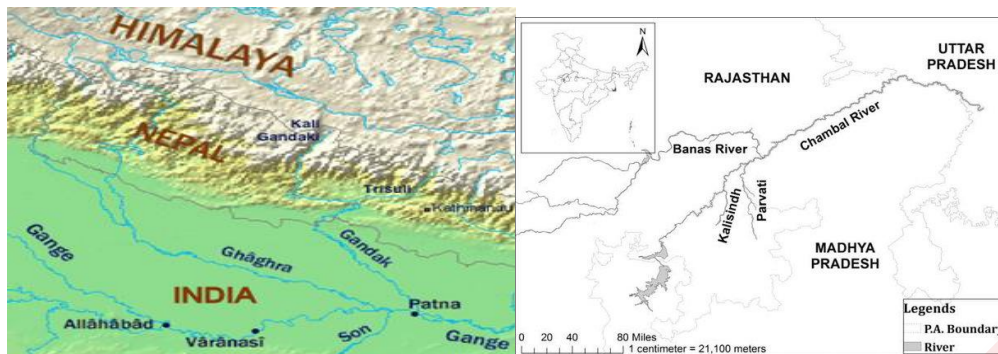
Subtopic:)

Q.5)

Ans) a

Exp) Option a is the correct answer.

India has three species of Crocodylians namely: **Gharial** (*Gavialis gangeticus*), **Mugger crocodile** (*Crocodylus palustris*) and **Saltwater crocodile** (*Crocodylus porosus*). Gharial is classified as **Critically Endangered** by the IUCN red list. **National Chambal Sanctuary** (Madhya Pradesh, Uttar Pradesh and Rajasthan) **on the River Chambal hosts 77% of the global population of Gharials and is the most successful breeding site for Gharials in India.**



Recently, The **Gandak** river became the **second successful breeding site for Gharials** in India after the Chambal sanctuary. Conservation efforts by the Bihar government in the Gandak river have increased the gharial population from 30 in 2014 to 217 gharials in 2023. A total of 37 adult gharials, 50 sub-adults, 49 juveniles and 81 yearlings were observed during the survey.

Source: <https://www.thehindu.com/sci-tech/energy-and-environment/conservation-efforts-bear-fruit-as-survey-finds-record-gharials-in-bihars-gandak-river/article66826192.ece>

Subject:) Environment

Topic:) Biodiversity

Subtopic:)

Q.6)

Ans) c

Exp) Option c is the correct answer.

In some species of spiders, the female eats the male after copulation. This behavior is known as **sexual cannibalism**. Sexual cannibalism has been observed in over 100 families of spiders, including black widows, brown widows, and crab spiders. Scientists believe that sexual cannibalism provides a number of benefits to the female spider. For example, eating the male can provide the female with additional nutrients, which can help her to produce more eggs. Sexual cannibalism can also help the female to reduce the risk of being infected with parasites or diseases from the male.

Source: <https://www.thehindu.com/sci-tech/energy-and-environment/how-the-male-mantis-avoids-being-decapitated-after-mating/article33624060.ece>

Subject:) Environment

Topic:) Biodiversity

Subtopic:)

Q.7)

Ans) a

Exp) Option a is the correct answer.

Statement I and statement II both are correct, and statement II is the correct explanation of statement I: It is generally observed that the heat waves may cause dizziness, nausea, confusion and hallucinations in humans. As per recent research extreme heat can have a profound effect on one's mental health, leading to increased aggression, suicidal behaviour, depressive tendencies.

One of the primary reasons behind the various impacts of heat waves on human physical and mental health is that **the extreme sweating during heat waves causes deficiency of sodium and potassium ions in body, which affects the brain's signaling system.** Sodium regulates fluid balance and supports healthy neuron function. Similarly, the potassium mineral helps brain cells communicate with each other and

with cells farther away in one's body. When these mineral ions are excreted from the body due to extreme sweating during heat waves the brain function disrupts which causes disorientation, dizziness, nausea, confusion of even hallucination.

Source: <https://www.hindustantimes.com/lifestyle/health/is-heatwave-making-you-cranky-impact-of-extreme-heat-on-moods-how-to-deal-with-it-101714716118998.html>

<https://timesofindia.indiatimes.com/life-style/health-fitness/health-news/sodium-and-potassium-what-we-need-to-know-about-the-signs-and-risks-of-their-imbalance/articleshow/100272764.cms>

Subject:) Geography

Topic:) Weather

Subtopic:)

Q.8)

Ans) b

Exp) Option b is the correct answer.

The Nile River is the world's longest river (6695 km) and its catchment basin covers 10% of the African continent. The importance of the Nile River Basin to the riparian countries makes it a central geopolitical issue in the region amid heightened water demand and deepening potential for water conflict. **The Ethiopian project "Grand Ethiopian Renaissance Dam (GERD)" on the Blue Nile tributary has been a bone of contention between Ethiopia on one side and Egypt and Sudan on the other side. In 2023 the filling of GERD by Ethiopia escalated the longstanding conflict between Ethiopia and Egypt.**

Source: <https://www.thehindu.com/news/international/ethiopia-to-start-generating-power-from-nile-dam-on-sunday/article65066065.ece>

<https://www.bbc.com/news/world-africa-66776733>

Subject:) Geography

Topic:) World Locations

Subtopic:)

Q.9)

Ans) b

Exp) Option b is the correct answer.

The Peninsular plateau is one of the oldest and the most stable landmass of India. The general elevation of the plateau is from the west to the east. The plateau is made up of a series of plateaus such as the **Hazaribagh plateau, the Palamu plateau, the Ranchi plateau, the Malwa plateau, the Coimbatore and the Karnataka plateau, etc.**

Statement 1 is correct: Malwa Plateau is part of the Peninsular plateau lying to the north of the Narmada River and known as the Central Highlands. **The Malwa plateau is bounded by Aravalli range to its north and north-west and Vindhyan range to its south.**

Statement 2 is correct: The Deccan Plateau is a triangular landmass that lies to the south of the river Narmada. **The Mahadev, the Kaimur hills and the Maikal range form eastern extensions of deccan plateau.** The Deccan plateau is separated by a fault from the Chotanagpur Plateau and extends into the **Northeast**. In the Northeast, this extension is locally known as the **Meghalaya, Karbi-Anglong Plateau and North Cachar Hills.**

Statement 3 is incorrect: The Barak River originates from the Manipur hills, not the Meghalaya plateau.

Barak river enters Bangladesh as **Surma and Kushiya**. Later, the river is called the **Meghna** and receives the combined flow of the **Ganga and Brahmaputra**. The principal **tributaries** of Barak are **the Jiri, the Dhaleswari, the Singla, the Longai, the Sonai and the Katakhal**.

Source: <https://ncert.nic.in/textbook/pdf/iess102.pdf>

<https://www.nios.ac.in/media/documents/SecSocSciCour/English/Lesson-09.pdf>

Subject:) Geography

Topic:) Physical Relief Features

Subtopic:)

Q.10)

Ans) b

Exp) Option b is the correct answer.



Statement 1 is incorrect: The India-Middle East-Europe Economic Corridor (IMEC) project is a multilateral infrastructure development project involving **India, the US, Saudi Arabia, the European Union, the UAE, France, Germany, and Italy**. The project was **launched at the G20 Summit in New Delhi (not during International North-South Transport Corridor (INSTC))**, which holds significant geopolitical and economic implications for India.

Statement 2 is correct: The India-Middle East-Europe Economic Corridor (IMEC) Project forms part of the **Partnership for Global Infrastructure and Investment (PGII)**. The PGII is an initiative of **G7 Nations** aimed at building connectivity, infrastructure, and trade projects in Asia, Europe, Africa, and Latin America.

PGII is a developmental initiative aimed at narrowing the infrastructure gap in developing countries as well as helping towards accelerating progress on SDGs globally.

Statement 3 is correct: The India-Middle East-Europe Economic Corridor (IMEC) project

aims to establish a **rail and shipping networks, hydrogen pipeline**, high speed data cable and energy cables between India and Eastern Europe nations. It proposes a dedicated hydrogen pipeline along with tapping the other sources of renewable energy such as solar and wind to reinforce the region's energy security.

Source: <https://www.thehindubusinessline.com/opinion/a-corridor-of-immense-promise/article67296263.ece>

<https://indianexpress.com/article/explained/everyday-explainers/india-europe-economic-corridor-pgii-explained-8933335/>

https://www.icwa.in/show_content.php?lang=1&level=3&ls_id=10061&lid=6413#:~:text=Key%20Elements%20of%20the%20Corridor&text=In%20pursuit%20of%20meeting%20the,infrastructure%20gap%20in%20developing%20countries.

Subject:) International Relations

Topic:) Agreements

Subtopic:)

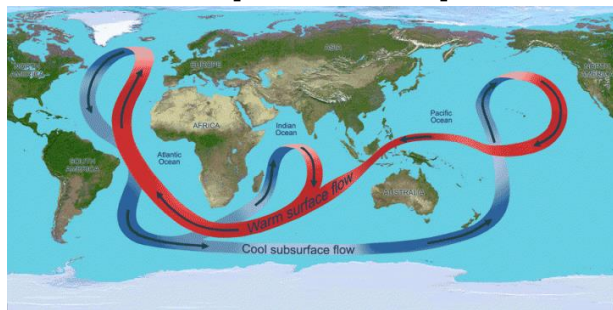
Q.11)

Ans) c

Exp) Option c is the correct answer.

Statement I is correct. A significant **slowdown** of the global conveyor belt could lead to **colder winters in Europe**. The global conveyor belt, particularly the North Atlantic Current (NAC), transports warm surface water from the tropics towards the poles. This warm water current helps moderate European winters. A slowdown would reduce the amount of warm water reaching Europe, leading to colder temperatures.

Statement II is incorrect. The global conveyor belt is a system of currents that transports **warm surface water from the tropics towards the poles and cold, deep water from poles to the equator**.



Source: <https://earth.org/atlantic-ocean-circulation-slowdown/>
https://oceanservice.noaa.gov/education/tutorial_currents/05conveyor2.html
<https://education.nationalgeographic.org/resource/ocean-conveyor-belt/>

Subject:) Geography

Topic:) Oceanography

Subtopic:)

Q.12)

Ans) a

Exp) Option a is the correct answer.

Statement I is correct. The southern slopes of the Himalayas have a thicker vegetation cover compared to the northern slopes. The southern slopes receive relatively higher precipitation because they are exposed to the moist monsoon winds coming from the Indian Ocean. These winds bring significant rainfall to the southern slopes, fostering dense and lush vegetation.

Statement II is correct. The Northern slopes receive less precipitation than the southern slopes. This is due to the rain shadow effect of the Himalayas. As moisture-laden winds blow from the south, they rise over the Himalayas, causing them to cool and condense, releasing precipitation on the southern slopes. The remaining air, having lost most of its moisture, descends on the northern side, creating a rain shadow and resulting in less precipitation.

Statement II explains Statement I: This rain shadow effect is responsible for the vast differences in vegetation between the northern and southern slopes of the Himalayas. The southern slopes, receiving the brunt of the monsoon rains, are lush and green, while the northern slopes are arid and cold.

Source: <https://ncert.nic.in/textbook/pdf/iess105.pdf>

<https://ncert.nic.in/ncerts/l/kegy105.pdf>

<https://ncert.nic.in/ncerts/l/iss105.pdf>

Subject:) Environment

Topic:) Vegetation

Subtopic:)

Q.13)

Ans) c

Exp) Option c is the correct answer.

- 1) **Global dimming** refers to the decrease in sunlight reaching Earth's surface primarily due to **airborne particles and pollutants, such as aerosols, emitted due to human (anthropogenic) activities** like biomass burning, fossil fuel combustion, vehicular emissions, etc. These particles scatter and reflect sunlight, reducing its intensity.
- 2) This phenomenon has far-reaching effects, including **cooling the climate, altering precipitation patterns, impacting agriculture, and posing health risks.**
- 3) Historically **observed since the mid-20th century**, global dimming's **interplay with global warming** underscores the intricate dynamics shaping Earth's climate.
- 4) Efforts to mitigate air pollution have shown some reduction in dimming, but its implications remain significant for understanding and addressing environmental challenges.

Source: <https://www.theguardian.com/environment/2012/may/11/global-dimming-pollution>

Subject:) Environment

Topic:) Climate Change

Subtopic:)

Q.14)

Ans) c

Exp) Option c is the correct answer.

Brumation is a state of inactivity or sluggishness that some reptiles like snakes and lizards exhibit during winter or periods of low temperatures. Only cold-blooded animals exhibit the state of brumation.

Reptiles undergo a process called brumation, which differs from hibernation. Unlike hibernating animals, **reptiles in brumation** may emerge during warm spells to bask in the sun and hydrate. This behavior helps them regulate hydration levels.

Option 1 is incorrect. Bats, unlike some other mammals, exhibit torpor rather than brumation. Torpor involves a temporary decrease in metabolic rate and body temperature to conserve energy, typically during periods of inactivity. This adaptation allows bats to survive harsh conditions while minimizing energy expenditure, crucial for their nocturnal lifestyle and survival.

Options 2, 3 and 4 are correct: Turtles, alligators, and lizards species exhibit brumation, a reptilian form of hibernation. During colder months, they enter a state of decreased metabolic activity and reduced movement to conserve energy. Unlike mammals, their body temperature remains closer to the ambient temperature. They seek shelter in burrows, mud, or underwater hideouts. While in brumation, they may go weeks or months without eating, relying on stored fat reserves. This adaptive strategy helps them survive adverse environmental conditions, allowing these reptiles to endure winter months and emerge relatively unscathed when temperatures rise.

Knowledge Base:

1) Torpor is a state of decreased physical activity that some animals intentionally enter to conserve metabolic energy. Unlike hibernation or brumation, which are longer-term strategies, torpor can be as short as one night or extended for longer periods depending on the animal's needs. It's not restricted to colder months but can occur any time of year. **Many birds, opossums, certain bat species, skunks, and some squirrels utilize torpor** to conserve energy, especially when food sources are scarce, such as at night or during colder months.

2) Hibernation is a physiological adaptation used by certain animals. It is a state of inactivity and dormancy that allows some animals to survive in cold climates with limited food availability during the winter.

Source: <https://www.thehindu.com/sci-tech/science/brumation-winter-is-coming-for-reptiles/article67856360.ece>

https://webfiles.clarkcountynv.gov//Parks%20%20Recreation/Wetlands%20Park/ExplorersActivities/16_hibernation-brumation.pdf

<https://academic.oup.com/icb/article/51/3/337/640694>

<https://vetmed.tamu.edu/news/pet-talk/turtle-brumation/>

<https://scaquarium.org/brumation/>

<https://peedeewildlifecontrolinc.com/hibernation-brumation-and-torpor-when-animals-sleep/>
Subject:) Environment

Topic:) Biodiversity

Subtopic:)

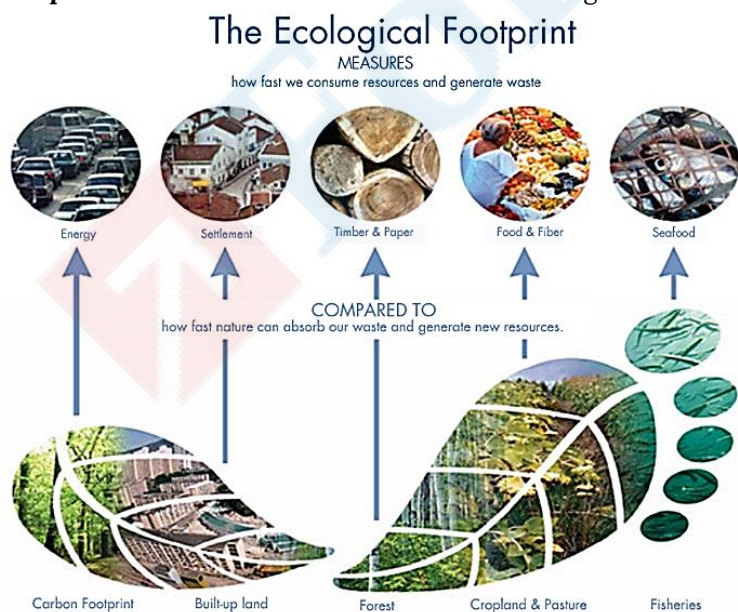
Q.15)

Ans) d

Exp) Option d is the correct answer.

The **ecological footprint** is a method that determines how dependent humans are on natural resources. It is a measure that indicates how much resources from the environment are required to support a specific way of life or business. In other words, it measures how fast we consume resources and generate waste compared to how fast nature can absorb our waste and generate resources. It **is a measure of the area of biologically productive land and water that is required for an individual or an activity to produce all the resources it consumes and to absorb the waste it generates, using prevailing technology and resource management practices**

Hence, the ecological footprint simply indicates the amount of pressure that humans put on the natural resources available to them in their surroundings. It is the only metric that measures how much nature we have and how much nature we use. The **Global Footprint Network (GFN) calculates the ecological footprint** for the world and over 200 nations using UN data sources.



Knowledge Base:

1) A **biodiversity footprint** is a quantitative method that measures the impact of human activities on biodiversity. It can be used to assess the damage caused by activities such as land use, resource consumption, biological invasion, ecosystem damage, and wildlife protection.

2) The **Ecosystem Health Index (EHI)** quantifies average change in ecological integrity (biotic or environmental degradation), using data from Red List of Ecosystems risk assessments, or other relevant sources. The indicator combines measures of the extent and relative severity of change in ecosystem-specific ecological variables, scaled to quantify transitions towards or away from ecosystem collapse over a given timeframe.

3) The **Living Planet Index (LPI)** is an indicator of the state of global biodiversity, based on trends in the populations of vertebrate species. The LPI is managed by the Zoological Society of London (ZSL) in cooperation with the World Wide Fund for Nature (WWF). The LPI measures the average relative decline in monitored wildlife populations, relative to the year 1970, which is set as 100%. The LPI tracks populations of mammals, birds, fish, reptiles, and amphibians.

Source:

<https://www.footprintnetwork.org/resources/glossary/#:~:text=overshoot%20by%20definition.-,Ecological%20Footprint,in%20short%20form%20as%20Footprint.>

<https://www.thehindu.com/education/how-to-reduce-your-ecological-footprint/article67317974.ece>

<https://www.repsol.com/en/energy-and-the-future/future-of-the-world/ecological-footprint/index.cshhtml#:~:text=You%20can%20calculate%20your%20ecological,and%20services%20demanded%20by%20society.>

Ecological Footprint Meaning & Definition | EcoOnline

Subject:) Environment

Topic:) Ecosystem

Subtopic:)

Q.16)

Ans) c

Exp) Option c is the correct answer.

Ozone-depleting substances (ODS) are chemical substances that contribute to the breakdown of the ozone layer in Earth's stratosphere. The ozone layer acts as a shield, protecting life on Earth from the harmful ultraviolet (UV) radiation from the sun. When ODS break down ozone molecules, they create **holes in the ozone layer**, which allows more UV radiation to reach the Earth's surface.

Option 1 is correct: Carbon tetrachloride (CCl₄): This is an ODS. When it breaks down in the stratosphere, it **releases chlorine atoms** that contribute to ozone depletion. Carbon tetrachloride was once used in refrigerants, fire extinguishers, but many of its consumer uses has been phased out due to its ozone-depleting properties. It has **Ozone depleting potential (ODP) of 1.1 and a lifetime of around 26 years.**

Option 2 is incorrect: Hydrofluorocarbon (HFC): This is **not** an ODS. Unlike CFCs (chlorofluorocarbons), **HFCs do not contain chlorine or bromine atoms that can break down ozone.** They were developed as a replacement for CFCs in many applications such as refrigerants and air conditioners. However, **HFCs are greenhouse gases and contribute to climate change.**

Option 3 is correct: Methyl bromide (CH₃Br): This is an ODS. It was used as a fumigant in agriculture and pest control. Methyl bromide breaks down in the stratosphere releasing bromine atoms that destroy ozone. The Montreal Protocol has restricted the use of methyl bromide, with exemptions for critical uses. It has **ODP of 0.7 and a lifetime of around 0.8 years.**

Option 4 is correct: Methyl chloroform (CH₃CCl₃): Also known as 1,1,1-trichloroethane, it is an ODS. Similar to carbon tetrachloride, it **releases chlorine atoms upon breakdown in the stratosphere, leading to ozone depletion.** Methyl chloroform was once used in refrigerants, solvents, and cleaning agents, but its use has been phased out due to its ozone-depleting potential. It has **ODP of 0.1 and a lifetime of around 5 years.**

Source: <https://www.epa.gov/ozone-layer-protection/ozone-depleting-substances>

<https://www.unep.org/ozonaction/who-we-are/about-montreal-protocol>

<https://ozonecell.nic.in/home-page/montreal-protocol-implementation-in-india/regulatory-framework/#:~:text=Hydrocarbons%20including%20isobutane%20and%20cyclopentane,foam%20blowing%20and%20refrigeration%20sectors.>

Subject:) Environment

Topic:) Climate Change

Subtopic:)

Q.17)

Ans) b

Exp) Option b is the correct answer.

Microorganisms are organisms that can be seen only through a microscope. Microorganisms include bacteria, protozoa, algae, and fungi. Although viruses are not considered living organisms, they are sometimes classified as microorganisms.

Statement 1 is incorrect: Majority of Viruses contain genetic material, that could be **either RNA or DNA. Exceptionally, a few viruses do contain both DNA and RNA** as their genetic material. Examples include **Leukoviruses and Rous's viruses** are a type of tumour viruses that cause cancer.

Statement 2 is correct: Viroids do not contain the lipid layer, or the protein coat found in viruses. **Viroid are appeared to be just plain simple RNA.** This RNA would enter a cell as RNA, force the cell to make more copies of itself, and the new RNAs would then infect other cell. Viroid resemble the viruses. There is, however, one important distinction. Usually, genetic material contains a code that tells cells how to make various proteins. This is true of all known organisms, including viruses. But the RNA of viroids do not code for any protein. For the most part, they are just small pieces of RNA that served no function apart from propagating themselves.

Statement 3 is correct: Bacteria can survive in extreme conditions, including both very high and freezing temperatures. For instance, **Cyanobacteria can** survive in extreme temperature conditions, ranging from **Antarctic ice to continental hot springs.**

Source: <https://ncert.nic.in/textbook/pdf/kebo102.pdf> (Pg no 20&21)

<https://www.thehindu.com/sci-tech/science/rna-obelisk-next-generation-sequencing/article67891037.ece>

Subject:) Science & Tech

Topic:) Microorganisms

Subtopic:)

Q.18)

Ans) b

Exp) Option b is the correct answer.

The **Great Indian Bustard** (*Ardeotis nigriceps*) is **one of the four bustard species found in India**, and it inhabits **grassland and semi-arid regions.** It is listed as **Critically Endangered on the IUCN Red List.** Recognizing the urgency of its conservation, it's also identified as **one of the species for the recovery**

program under the Integrated Development of Wildlife Habitats of the Ministry of Environment and Forests, Government of India.

Statement 1 is correct: The Great Indian Bustard, with an average weight of around 15kg holds the distinction of being one of the heaviest flying bird of India and is also among the largest flying birds of the world.

Statement 2 is correct: Desert National Park in Rajasthan is well-known for its great Indian bustard population. Desert National Park is an excellent example of the ecosystem of the Thar Desert and its diverse wildlife adventure.

Statement 3 is incorrect: Diclofenac poses a significant threat to vultures rather than the Great Indian Bustard. The biggest threat to the GIB include **mortality from collisions with overhead power lines** (this caused most deaths of GIB in India), and other significant threats includes; hunting, poaching, vehicle accidents, predation by free-ranging dogs, habitat loss due to agricultural expansion, and the impact of infrastructure development and industrialization.

Source: <https://indianexpress.com/article/explained/explained-law/supreme-court-conservation-great-indian-bustard-9234896/>

https://www.wwfindia.org/about_wwf/priority_species/threatened_species/great_indian_bustard/

<https://www.thehindu.com/news/national/andhra-pradesh/is-the-great-indian-bustard-on-the-verge-of-local-extinction/article67824287.ece>

Subject:) Env/ Science

Topic:) Biodiversity

Subtopic:)

Q.19)

Ans) d

Exp) Option d is the correct answer.

The sixth session of the United Nations Environment Assembly (UNEA-6) took place from 26 February to 1 March 2024 at the United Nations Environment Programme (UNEP) headquarters in Nairobi, Kenya. **UNEA-6 concluded** with the adoption of **15 resolutions to advance collaborative action on the “triple planetary crisis”**.

Option a is correct: The triple planetary crisis refers to the three main interlinked issues that humanity currently faces: **climate change, pollution and biodiversity loss**. Each of these issues has its own causes and effects and each issue needs to be resolved if we are to have a viable future on this planet.

Climate change refers to long-term shifts in temperatures and weather patterns that in the long run will completely alter the ecosystems that support life on the planet. Human activities are the main drivers of climate change.

Air Pollution is caused by everything from traffic and factories to wildfires, volcanoes. Air Pollution is the largest cause of disease and premature death in the world, with more than seven million people dying prematurely each year due to pollution.

Biodiversity loss refers to the decline or disappearance of biological diversity, which includes animals, plants and ecosystems. The **reasons** for biodiversity loss include everything from overfishing to habitat loss mainly driven by deforestation for development needs and to desertification due to climate change.

Source: <https://www.thehindu.com/opinion/op-ed/a-new-lease-of-life-for-climate-action/article66032173.ece>

<https://www.unep.org/environmentassembly/unea6>

<https://unfccc.int/news/what-is-the-triple-planetary-crisis>

Subject:) Environment

Topic:) Climate Change Subtopic:)

Q.20)

Ans) b

Exp) Option b is the correct answer.

Conservation Assured Tiger Standards (CA|TS) is a set of criteria which allows tiger sites to check if their **management will lead to successful tiger conservation** as per the international standards.

In India, the implementation of CA|TS was initiated by National Tiger Conservation Authority (NTCA) in collaboration with Global Tiger Forum (GTF) in the year 2015.

Options 1, 2, 3 and 4 are correct: So far, a total of 23 tiger reserves of India have received CA|TS accreditation. In the recent times, **six tiger reserves namely Kali (Dandeli-Anshi) (Karnataka), Melghat (Maharashtra), Navegaon - Nagzira (Maharashtra), Tadoba-Andhari (Maharashtra), Pilibhit (Uttar Pradesh), and Periyar (Kerala) tiger reserves** have been awarded with CA|TS accreditation.

Few tiger reserve of India that have received CA|TS accreditation are as follows:

- 1) **Manas, Kaziranga and Orang Tiger Reserve in Assam,**
- 2) **Bandhavgarh, Satpura, Kanha and Panna Tiger Reserve in Madhya Pradesh**
- 3) **Sathyamangalam, Mudumalai and Anamalai Tiger Reserve in Tamil Nadu.**
- 4) **Pench Tiger Reserve in Maharashtra**
- 5) **Valmiki Tiger Reserve in Bihar**
- 6) **Dudhwa in Uttar Pradesh**
- 7) **Sunderbans in West Bengal,**
- 8) **Parambikulam Tiger Reserve in Kerala**
- 9) **Bandipur Tiger Reserve of Karnataka**

Options 5 and 6 are incorrect: Simlipal Tiger Reserve (Odisha) and Sariska Tiger Reserve (Rajasthan) have not been awarded with CA|TS accreditation.

Source: <https://timesofindia.indiatimes.com/city/bareilly/pilibhit-tiger-reserve-among-six-tiger-reserves-in-india-to-get-cats-approval/articleshow/99020050.cms>

<https://pib.gov.in/PressReleasePage.aspx?PRID=1740353>

https://ntca.gov.in/assets/uploads/Reports/Annual_Reports/Annual_report_english_2022_23.pdf
(Pg no 64)

Subject:) Env/Science

Topic:) Protected Areas

Subtopic:)

Q.21)

Ans) c

Exp) Option c is the correct answer.

Statement I is correct: At present, **India's foreign exchange reserve is around \$648.562 billion**, and it consists of **foreign currencies, gold reserves, special drawing rights (SDRs)** allocated by the International Monetary Fund (IMF), and **reserve position in the IMF.**

- 1) Among all, the **largest component of India's forex reserves is in the form of foreign currency assets (\$571.17 billion)**, which are typically held in major currencies such as the US dollar, euro, Japanese yen, etc.
- 2) The foreign currency assets are followed by **gold reserves (\$54.56 billion), SDRs (\$18.17 billion) and Reverse position in the IMF (\$4.67 billion).**
- 3) These reserves are important for ensuring stability in the Indian economy, supporting external trade, maintaining confidence in the domestic currency, and providing a buffer against external shocks.

Statement II is incorrect: There is a cost associated with holding foreign currency reserves by a nation. This cost includes the **opportunity cost** of not investing those reserves in other assets that could potentially generate higher returns, as well as the **cost of managing and maintaining those reserves**. Additionally, there could be **costs related to currency fluctuations and interventions to stabilize the value of the domestic currency**.

Hence, Statement-I is correct but Statement-II is incorrect.

Source: <https://www.indiabudget.gov.in/economicsurvey/doc/eschapter/echap11.pdf>

<https://m.economictimes.com/news/economy/indicators/rbi-mpc-indias-forex-reserves-at-an-all-time-high-of-645-6-bn-as-of-march-29/articleshow/109052775.cms>

Subject:) Economy

Topic:) Forex Reserves

Subtopic:)

Q.22)

Ans) c

Exp) Option c is the correct answer.

Recently, the Security and Exchange Board of India (SEBI) approved the creation of "**Social Stock Exchange**" to enable non-profit organizations and for-profit enterprises to raise funds. The proposal for the creation of a Social Stock Exchange was put forth by the Finance Minister in the 2019 Union Budget. Social Stock Exchange (SSE) is a platform that allows investors to invest in select social enterprises or social initiatives. The primary aim of the SSE is to help **social and voluntary enterprises to raise capital in the form of equity or debt or a unit of the mutual fund** to implement their social initiatives such as providing healthcare or clean energy.

Source: <https://www.thehindu.com/business/Economy/explained-combining-social-welfare-and-capital-markets-through-sse/article66569251.ece>

<https://www.nseindia.com/sse>

[https://nsearchives.nseindia.com/web/sites/default/files/inline-](https://nsearchives.nseindia.com/web/sites/default/files/inline-files/Social%20Stock%20Exchange%20FAQs_English.pdf)

[files/Social%20Stock%20Exchange%20FAQs_English.pdf](https://nsearchives.nseindia.com/web/sites/default/files/inline-files/Social%20Stock%20Exchange%20FAQs_English.pdf) (Pg no 11- Point 46&47)

<https://forumias.com/blog/social-stock-exchange/>

Subject:) Economy

Topic:) Capital Market

Subtopic:)

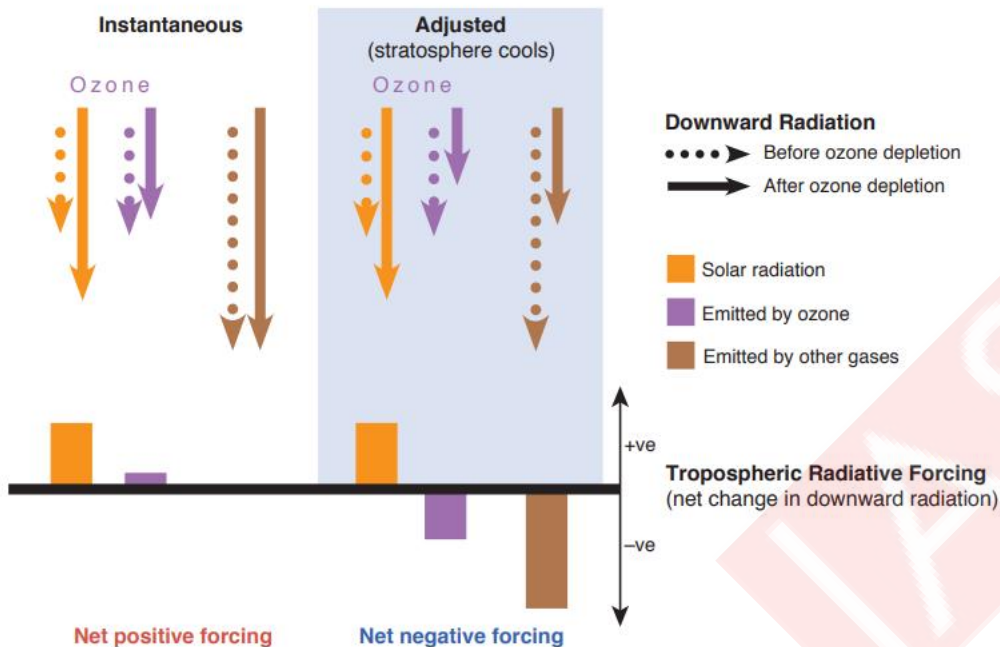
Q.23)

Ans) c

Exp) Option c is the correct answer.

Ozone (O₃) is a gas that exists in two layers of the atmosphere: the stratosphere (upper layer) and the troposphere (ground level up to 10km). In the stratosphere, ozone protects life on Earth from the sun's ultraviolet radiation. In the troposphere, it is a powerful greenhouse gas and air pollutant that harms human health and ecosystems. **Negative radiative forcing is a factor that cools the Earth's surface** by causing the Earth to lose more energy to space than it receives from the sun.

Statement I is correct: Stratospheric ozone depletion has caused a small negative radiative forcing since preindustrial times. Ozone in both the stratosphere and the troposphere absorbs outgoing longwave infrared radiation emitted from Earth's surface, trapping heat in the atmosphere. Ozone absorbs solar ultraviolet (UV) radiation (thereby warming the stratosphere).



The instantaneous effect of stratospheric ozone depletion (left-hand side of schematic) is -

- 1) to increase the shortwave radiation from the Sun reaching the tropopause (because there is less ozone to absorb it),
- 2) to slightly reduce the downward longwave radiation from the stratosphere, as there is less ozone in the stratosphere to emit radiation. This gives an instantaneous net positive radiative forcing.

However, **after getting adjusted to this** instantaneous effect-

In response to less absorption of both shortwave and longwave radiation in the stratosphere, the region cools, which leads to an overall reduction of thermal radiation emitted downward from the stratosphere (right-hand side of schematic).

Statement II is incorrect: Stratospheric ozone is formed naturally by chemical reactions involving solar ultraviolet radiation (sunlight) and oxygen molecules, which make up about 21% of the atmosphere. In the first step, solar ultraviolet radiation breaks apart one oxygen molecule (O_2) to produce two oxygen atoms ($2 O$). In the second step, each of these highly reactive oxygen atoms combines with an oxygen molecule to produce an ozone molecule. It is **not directly emitted from the vehicular emissions, thermal power plants and agricultural processes**.

Source: <https://indianexpress.com/article/explained/explained-climate/large-ozone-hole-antarctica-explained-8979396/>

Subject:) Environment

Topic:) Climate Change

Subtopic:)

Q.24)

Ans) d

Exp) Option d is the correct answer.

The Reserve Bank of India (RBI) will pay a record dividend of Rs 2.1 lakh crore to the government for the fiscal year ending March 31, significantly exceeding the budgeted expectation.

Option 1 is correct. Open market operations, wherein central bank purchases or sells bonds in the open market in order to regulate money supply in the economy, are a major source of income for the RBI. Apart from the interest received from these bonds, the RBI may also profit from favourable changes in bond prices.

Option 2 is correct. Dealings in the foreign exchange market that the RBI engages in may also contribute to the bank's profits. The RBI, for instance, may invest in dollars when Dollar is cheaper and sell them dear in the future to pocket profits. The recent increase in the dividend paid by RBI to the government can be attributed to the gains made by the central bank from **selling dollars from its foreign exchange reserves** to support the rupee.

Option 3 is correct. RBI earns its income also from the **interest earned from** short-term lending to liquidity-starved commercial banks through **repurchase agreements (repo)**.

Option 4 is correct. **Seigniorage refers to the profit earned by the central bank from the issuance of currency.** When the RBI prints currency notes and provides them to commercial banks, it receives the face value of the notes in return. However, the cost of printing these notes is significantly lower, resulting in a profit for the RBI.

Source: <https://www.thehindu.com/business/Economy/where-do-the-rbis-earnings-come-from/article29310531.ece>

<https://www.financialexpress.com/opinion/sources-and-uses-of-rbi-surpluses/3500868/>

<https://timesofindia.indiatimes.com/business/india-business/explained-how-rbi-managed-to-give-the-highest-ever-rs-2-1-lakh-crore-dividend-payout-to-government/articleshow/110356064.cms>

Subject:) Economy

Topic:) Monetary Policy

Subtopic:)

Q.25)

Ans) b

Exp) **Option b is the correct answer.**

In the startup ecosystem, many companies and terms are often named after animals, either real or imaginary, to create a memorable and impactful brand identity.

Statement 1 is correct: A unicorn is a startup that is **privately owned with a valuation that exceeds \$1 billion**. Start-ups that become unicorns are frequently inventive, innovative businesses that operate in a range of industries, including technology, e-commerce, finance, healthcare, and more. They frequently grow quickly and draw substantial investments from venture capitalists and other investors.

Statement 2 is incorrect: Gazelles (not Cheetah) are startup **valued between \$500 million and \$1 billion and are most likely to cross \$1 billion in valuation within three years**. They are fast-growing startups with the potential to become unicorns.

Statement 3 is incorrect: Cheetah (not Gazelles) are startup **valued between \$200 million and \$500 million** and are most likely to **enter the \$1 billion club in five years**. They represent faster-growing startups with the potential for high valuations.

Statement 4 is correct: A zebra startup is a for-profit, for-purpose startup that **prioritizes values like sustainability, social responsibility, and community**. Growth is as vital to zebras as it is to unicorns, but it is expressed not in growth rates per se, but rather in **the influence made on the environment: development of local communities, improvement in employee happiness levels, encouragement of cultural changes, and so on**

Source: <https://www.thehindu.com/business/Industry/unicorn-cheetah-start-ups-decline-y-o-y-hurun-index/article67016581.ece>

<https://www.forbesindia.com/article/startups/unicorns-gazelles-cheetahs-a-billiondollar-startup-question/86165/1>

https://www.business-standard.com/companies/news/8-gazelles-demoted-to-cheetahs-19-dropped-out-of-hurun-unicorn-index-123062700871_1.html

<https://www.freepressjournal.in/weekend/unicorns-gazelles-cheetahs-and-zebras-what-do-these-terms-mean-in-the-startup-world>

Subject:) Economy

Topic:) Start Ups

Subtopic:)

Q.26)

Ans) c

Exp) Option c is the correct answer.

Good Agricultural Practices (GAPs) are a set of principles, regulations, and technical recommendations designed for agricultural production, processing, and food transport. These practices **aim to ensure the safety and health of food products, protect the environment, and improve the conditions of agricultural workers and their families.**

According to the **Food and Agriculture Organisation (FAO)**, GAPs encompass on-farm production and postproduction processes to **achieve economic, social, and environmental sustainability.**

Implementing GAPs **promotes sustainable agriculture by encouraging the efficient use of resources such as pesticides, fertilizers, and water**, and by **fostering eco-friendly farming practices.**

Statement a is correct: Avoid applying pesticides during strong winds and heavy rain; This is considered a GAP because applying pesticides in adverse weather conditions can lead to drift, reducing the effectiveness of the pesticide and potentially causing harm to non-target areas and organisms. It can also lead to environmental contamination.

Statement b is correct: Sowing leguminous green manure crop before the onset of the rainy season:

1) This is **considered as a GAP**, as it enriches the soil with nitrogen through nitrogen fixation, thus improving soil fertility.

2) Green manure crops grown with the objective of clothing the surface with a vegetative cover, especially in hill slopes during the rainy season to avoid soil erosion and run off.

Statement c is incorrect: Applying lime on basic soil:

1) This is **not considered a GAP**. Applying **lime on basic (alkaline) soil can increase soil pH further**, potentially causing nutrient imbalances and affecting crop growth adversely.

2) It's generally recommended to **apply lime on acidic soils to neutralize acidity**, but on basic soils, it can have detrimental effects. It is recommended to **apply gypsum on the basic soil (alkaline soil).**

Statement d is correct: Irrigate fields early in the morning, late in the evening, or at night:

1) This is **considered a GAP, because irrigating fields during these times reduces water loss due to evaporation** and minimizes the risk of diseases associated with prolonged moisture on foliage.

2) It also ensures better water absorption by plants, promoting optimal growth and water efficiency.

Source:

<https://iisrindore.icar.gov.in/goodagripractices.html#:~:text=Examples%20are%20using%20disease%20Dfree,picking%2C%20erecting%20traps%20and%20mulching.>

https://agritech.tnau.ac.in/agriculture/agri_greenmanuring_agronomygreenmanures.html

<https://www.thehindu.com/news/national/andhra-pradesh/chilli-task-force-recommends-adoption-of-good-agricultural-practices-and-mechanisation-at-all-levels-of-production/article66247016.ece>

Subject:) Economy Topic:) Agriculture Subtopic:)

Q.27)

Ans) b

Exp) Option b is the correct answer.

Statement 1 is incorrect: In India, around 75% of sesame seeds are cultivated during the Kharif season (June to September). The Kharif season is characterized by the monsoon rains and warm climate, which are suitable for sesame cultivation. While some sesame is grown during the Rabi season (October to February), it is not the predominant period for cultivation.

Statement 2 is correct: Sesame seeds are indeed rich in phytosterols, which are compounds known for their cholesterol-lowering properties. Other health benefits of Sesame seeds are: It is rich in dietary fibers which aids in digestion, it improves blood pressure, helps in balancing hormones and boosts nutrient absorption. It is also good for respiratory disorders, eye-infections, and digestive ailments.

Statement 3 is correct: The Minimum Support Price (MSP) system, implemented by the Government of India, plays a pivotal role in supporting farmers by ensuring they receive fair prices for their agricultural produce. In India, MSP is announced for 22 crops, including sesame seeds, and is decided by the Cabinet Committee on Economic Affairs (CCEA), presided by the Prime Minister of India, based on recommendations from the Commission for Agricultural Costs and Prices (CACP).

Statement 4 is incorrect: West Bengal is the highest producer of Sesame seeds in India, followed by Madhya Pradesh and Rajasthan. Other major Sesame seeds producing states includes; Uttar Pradesh, Gujarat, Tamil Nadu, Karnataka, Andhra Pradesh and Telangana.

Statement 5 is correct: Onattukara sesame (Ellu) is a type of sesame seed grown in the state of Kerala, India. It's known for its health benefits, including its high antioxidant content and unsaturated fat. The antioxidants in Onattukara sesame help fight free radicals, which can damage body cells. It is also rich in Vitamin E, Oleic Acid and Palmitoleic Acid. It was accorded with GI Tag in January 2023.

Source: <https://www.thehindu.com/news/national/kerala/onattukara-sesame-set-to-ride-high-on-gi-tag/article66347100.ece>

https://ncdex.com/public/uploads/downloads/Performance%20Review%20Sesame%20Seed%20FY%202020-21_1624532189.pdf

<https://www.niftem.ac.in/site/pmfme/processingnew/seasameprocessing.pdf>

<https://theprint.in/economy/sesame-the-super-seed-that-got-the-highest-msp-jump-from-modi-govt/676400/>

Subject:) Economy

Topic:) Agriculture

Subtopic:)

Q.28)

Ans) b

Exp) Option b is the correct answer.

Statement 1 is incorrect: India is the third-largest exporter of textiles and apparels worldwide (Year 2022-23), after Germany and China. As per Textile export data of India, India's top export markets for textiles are the United States, the United Arab Emirates, and the United Kingdom.

Statement 2 is correct: The major textile hubs in India are Ludhiana, Surat and Erode. India's main textile hubs, Ludhiana, Surat, and Erode, have been facing an almost insurmountable difficulty for about a year now: growing imports of man-made fiber (MMF) fabrics, or even large-scale dumping of these fabrics, which is negatively impacting textile sector in India.

Statement 3 is correct: The textile sector is the **second largest provider of employment in India**, after agriculture. It provides employment to an estimated 45 million people directly and to another 60 million indirectly through allied activities.

Statement 4 is incorrect: China is the world's largest producer of man-made fiber (MMF), and their **exports from China (not Nepal or Bhutan) pose a significant challenge to the Indian textile sector** due to their sheer volume and potentially lower prices.

Statement 5 is correct: Indian government allows **100% Foreign Direct Investment (FDI)** in the textile sector through the automatic route. This means that foreign investors don't need prior approval from the government or the Reserve Bank of India (RBI) to invest.

Source: <https://theprint.in/macrosutra/why-indias-critical-textile-sector-employing-4-5-crore-people-is-facing-challenges/1299489/>

<https://www.thehindu.com/business/Industry/indias-60-billion-man-made-textile-sector-reels-from-chinese-imports-glut/article67668346.ece>

<https://www.financialexpress.com/business/industry-size-of-indias-textile-industry-to-double-by-2030-report-3284688/>

<https://economictimes.indiatimes.com/industry/cons-products/garments/-/textiles/indias-textile-exports-fall-for-second-year-in-a-row-due-to-geopolitical-issues/articleshow/109423799.cms?from=mdr>

<https://www.livemint.com/news/india/textile-exports-contract-4-2-on-year-in-11-months-of-fy24-11711271794325.html>

<https://www.thehindu.com/business/textile-industry-crisis-looms-large-as-demand-hits-a-low/article67615298.ece>

<https://www.investindia.gov.in/sector/textiles-apparel>

Subject:) Economy

Topic:) Industrial Sector

Subtopic:)

Q.29)

Ans) d

Exp) Option d is the correct answer.

Per capita GDP is a measure of the average economic output per person within a country. It is **calculated by dividing the total GDP of a country by its total population**. Per capita GDP provides a useful indicator of the standard of living and economic well-being of the individuals in that country, as it represents the average income or output per person after accounting for the size of the population.

Option 1 is correct: The proportion of the population of working age directly influences the **demographic dividend potential** of a country.

1) **Demographic dividend** refers to the economic benefit that can arise when the proportion of the working-age population (16 to 64 years) is higher than the dependent population (children and elderly).

2) A **larger working-age population relative to dependents can lead to increased productivity, higher savings, and greater economic growth potential, thereby contributing to higher levels of per capita GDP**.

Option 2 is correct: The **labour force participation rate** measures the proportion of the working-age population that is either engaged in the labour force or is seeking employment. A **higher participation rate means more people are contributing to economic output, which can lead to higher per capita GDP**.

Option 3 is correct: Productivity measures the efficiency with which inputs (such as labour and capital) are used to produce output. **Higher productivity** means that each worker can produce more goods or services in a given amount of time, leading to **higher levels of output and per capita GDP**.

Option 4 is correct: The **rate of savings and investment plays a crucial role in determining economic growth, and per capita GDP**.

1) **Savings:** When households, businesses, and the government save a significant portion of their income, it provides funds for investment. Higher savings rates allow for more capital accumulation, which provides impetus to economic growth, and thereby increasing per capita GDP as well.

2) **Investment:** Investment in physical capital (such as machinery, factories, and infrastructure) and human capital (education and skills) drives economic development, and hence plays a major role in enhancing per capita GDP.

Option 5 is correct: Technological advancement plays a crucial role in driving economic growth by enabling innovation, efficiency improvements, and the development of new products and industries. A **higher degree of technological advancement can lead to increased productivity and higher levels of GDP per capita**.

Source: <https://egyankosh.ac.in/bitstream/123456789/79459/1/Unit-2.pdf>

<https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp670.pdf>

<https://www.cbs.nl/en-gb/news/2009/37/growth-per-capita-gdp-mainly-due-to-increased-labour-productivity#:~:text=Average%20earnings%2C%20expressed%20in%20GDP,an%20average%201.5%20percent%20annually.>

Subject:) Economy

Topic:) GDP

Subtopic:)

Q.30)

Ans) c

Exp) Option c is the correct answer.

Semiconductors, also known as microchips or integrated circuits, are silicon-based components with millions or billions of transistors acting as electrical switches to process data. **Semiconductors** are considered today's 'new oil', **used in almost all electronic devices**, with countries racing each other for a share of the manufacturing and supply network.

Taiwan's dominance of the chip industry makes it an important economic player in the modern world.

Statement I is correct: Taiwan is one of the largest producers of semiconductor chips in the world.

Most of these chips are manufactured by a single company, Taiwan Semiconductor Manufacturing Corporation (TSMC) (which singlehandedly manufactures roughly 50% of the world's semiconductors).

Statement-II is incorrect: China (not Taiwan) is the world's largest producer and exporter of gallium and germanium. According to the European industry body, Critical Raw Materials Alliance (CRMA), China accounted for **80% of global gallium production** and **60% of global germanium production**. China is also the world's largest producer of Silicon.

Source: <https://www.economist.com/special-report/2023/03/06/taiwans-dominance-of-the-chip-industry-makes-it-more-important>

<https://www.businesstoday.in/technology/news/story/explainer-what-are-germanium-and-gallium-and-why-is-china-trying-to-restrict-its-export-388280-2023-07-10#:~:text=China%20is%20the%20world's%20leading,cent%20of%20the%20world's%20gallium.>

<https://www.thehindu.com/news/international/explained-why-is-china-limiting-exports-of-raw-materials/article67058415.ece#:~:text=It%20said%20that%20the%20controls,be%20enforced%20from%20August%201.>

<https://worldpopulationreview.com/country-rankings/semiconductor-manufacturing-by-country>

https://www.usitc.gov/publications/701_731/pub5473.pdf (Pg no 22)

<https://pubs.usgs.gov/periodicals/mcs2020/mcs2020-silicon.pdf> (pg no 149)

Subject:) Economy

Topic:) External Sector

Subtopic:)

Q.31)

Ans) c

Exp) Option c is the correct answer.

Option a is incorrect. This option suggests a concept of equality where **everyone is treated identically, without regard to their individual needs, circumstances, or inherent differences.** While it may seem fair on the surface, it **fails to address the reality of diverse needs and circumstances among individuals within society. For example, in India depressed classes were socially and economically exploited from centuries. So, the government, through various measures, is trying to uplift them.**

Option b is incorrect. This option removes the element of individual effort and motivation. Competition can be a driving force for improvement, as long as it's fair and based on merit. The focus should be on creating a system where everyone has an **equal chance** to compete, not eliminating competition altogether.

Option c is correct. This option reflects a more **comprehensive understanding of equality, emphasizing equal rights and opportunities for individuals to develop their abilities and fulfill their potential.** It recognizes that individuals have diverse skills, talents, and circumstances, and that true equality involves ensuring everyone has the opportunity to thrive and contribute to society.

Option d is incorrect. No society treats all its members in an identical way by eliminating all forms of differences. The smooth functioning of society requires division of work and functions and people often enjoy different status and rewards on account of it. The commitment to the ideal of equality does not imply the elimination of all forms of differences. It merely suggests that the treatment we receive and the opportunities we enjoy must not be pre-determined by birth or social circumstance

Source: <https://ncert.nic.in/ncerts/l/keps103.pdf>

Subject:) Polity

Topic:) Political Theory

Subtopic:)

Q.32)

Ans) c

Exp) Option c is the correct answer.

Article 3 of the Indian Constitution authorizes the **Parliament** to:

- 1) **form a new state** by separation of territory from any state or by uniting two or more states or parts of states or by uniting any territory to a part of any state;
- 2) **increase/diminish the area** of any state;
- 3) alter the boundaries of any state; and
- 4) alter the name of any state.

Statement I is correct: According to Article 3 of the Indian Constitution, any bill seeking to alter the boundaries of states (and the other above-mentioned aspects) must be introduced in any of the houses of Parliament with the President's recommendation. **Thus, a Constitutional Amendment bill for the formation of new states requires the prior approval of the President of India.**

Statement II is incorrect: Article 368 of the Constitution of India lays down the procedure for amendment of the Constitution which says that a bill amending the Constitution can be introduced in the Parliament either by a minister or a private member and does not require prior permission of the President.

Thus, it would be incorrect to say any bill amending the Constitution requires a prior recommendation of the President of India.

Source: Laxmikanth - Chapter: Union and its Territory

<https://www.constitutionofindia.net/articles/article-3-formation-of-new-states-and-alteration-of-areas-boundaries-or-names-of-existing-states/>

Subject:) Polity

Topic:) Constitutional Amendment Bill

Subtopic:)

Q.33)

Ans) a

Exp) Option a is the correct answer.

This landmark judgment of Supreme Court came in a case, M K Ranjitsinh & Ors vs Union of India & Ors, connected with the survival of the endangered **Great Indian Bustard and the Lesser Florican** species. These vulnerable species face several challenges because of pollution, climate change, predators and invasive species.

Option a is correct: The Supreme Court in **M K Ranjitsinh & Ors. vs the Union of India** ruled that people have a right against the adverse effects of climate change. **The court held that that as the havoc caused by climate change increases year by year, it becomes necessary to articulate right against the adverse effects of climate change as a distinct right. It is recognised by Articles 14 and 21.**

The Court has held that the **right to life (Art 21) and right to equality (Art 14)** could not be fully realized without a clean, stable environment. It expanded the scope of Art 14 and Art 21 to underline the need to protect lives and livelihoods in the face of climate change.

Source: <https://www.thehindu.com/news/national/right-against-climate-change-a-distinct-fundamental-and-human-right-sc-judgment/article68041693.ece>

<https://indianexpress.com/article/india/right-against-adverse-effects-of-climate-change-part-of-rights-to-life-equality-sc-9257007/>

<https://www.downtoearth.org.in/news/governance/analysis-what-does-the-new-supreme-court-judgment-mean-for-climate-action-in-india--95462>

Subject:) Polity

Topic:) Fundamental Rights

Subtopic:)

Q.34)

Ans) b

Exp) Option b is the correct answer.

- 1) In cases where a **Constitutional Amendment Act is challenged for not obtaining required state ratification, the Supreme Court of India will likely invalidate only the specific provisions that necessitated but did not receive such ratification, rather than voiding the entire amendment.**
- 2) This approach was established in the **Anti-Defection case (Kihoto Hollohan v. Zachillhu, 1992)**, where the **Court upheld the overall validity of the Tenth Schedule but struck down Paragraph 7 of the act for lack of state ratification**, as it affected Articles 136, 226, and 227.
- 3) Also Supreme Court upheld the validity of the 97th constitutional amendment that deals with issues related to effective management of cooperative societies but struck down a part inserted by it which relates to the Constitution and working of cooperative societies. This was because as certain provisions required the ratification of half the states.
- 4) The Supreme Court often applies the **“Doctrine of Severability”** in such cases. This means that **if specific provisions of a law (or amendment) are found unconstitutional or procedurally flawed, only those specific provisions are invalidated, not the entire act**, provided that the remaining parts of the act can stand independently and were validly enacted.

Source: <https://www.thehindu.com/news/national/supreme-court-in-majority-verdict-quashes-part-of-constitution-inserted-by-97th-amendment-on-cooperatives/article35419288.ece>

https://eparlib.nic.in/bitstream/123456789/63/1/Constitution_Amendment_India_LS_2008.pdf

Subject:) Polity

Topic:) Constitutional Amendment Bill

Subtopic:)

Q.35)

Ans) b

Exp) Option b is the correct answer.

Chief Election Commissioner and other Election Commissioners (Appointment, Conditions of Office and Terms of Office) Act, 2023 replaces the Election Commission (Conditions of Service of Election Commissioners and Transaction of Business) Act, 1991. It provides for the appointment, salary, and removal of the Chief Election Commissioner (CEC) and Election Commissioners (ECs).

Statement 1 is incorrect. A **Search Committee headed by the Minister of Law and Justice (not the Prime Minister)** and comprising two other members not below the rank of Secretary to the Government of India, shall prepare a panel of five persons for consideration of the Selection Committee, for appointment as the Chief Election Commissioner and other Election Commissioners.

Statement 2 is correct. The Chief Election Commissioner and other Election Commissioners shall be appointed by the President on the recommendation of a **Selection Committee consisting of-** (a) the Prime Minister–Chairperson; (b) the Leader of Opposition in the House of the People–Member; (c) a Union Cabinet Minister to be nominated by the Prime Minister–Member. **It does not have any judicial members.**

Statement 3 is correct. The **salary and conditions of service of the Chief Election Commissioner** and other Election Commissioners will be equivalent to that of a **Judge of Supreme Court.**

Source- <https://www.thehindu.com/elections/lok-sabha/watch-how-were-the-new-election-commissioners-selected-and-why-is-the-new-law-being-criticized/article67975248.ece>

<https://www.indiacode.nic.in/bitstream/123456789/19721/1/a2023-49.pdf>

Subject:) Polity

Topic:) Constitutional Bodies

Subtopic:)

Q.36)

Ans) a

Exp) Option a is the correct answer.

Statement 1 is incorrect. Article 361 of the Indian Constitution grants the President and Governors immunity from any criminal proceedings during their term of office for acts performed in the exercise of their official duties. But civil proceedings can be initiated against President or Governor during their term of office for their personal acts after giving two months' notice.

Statement 2 is correct. As per Article 361A of the Indian Constitution, an individual cannot be held liable to any civil or criminal proceedings in any court for publishing a true report in a newspaper regarding the proceedings of Parliament or State Legislature, unless it's demonstrated that the publication was done with malicious intent. **However, this protection doesn't cover reports from secret sessions of these bodies, which means he/she is liable for legal proceedings for covering such secret sessions.**

Statement 3 is incorrect. As per the Article 261 of the Constitution, the final judgments or orders delivered or passed by civil courts in any part of the territory of India shall be capable of execution anywhere within **that territory (not throughout India)** according to law.

Source: Laxmikant Ch-17 President

<https://indiankanoon.org/doc/1251904/>

<https://indiankanoon.org/doc/1470888/>

https://loksabhadocs.nic.in/Refinput/New_Reference_Notes/English/15072022_111659_1021205175.pdf

[https://indiankanoon.org/doc/178204325/#:~:text=\(1\)No%20person%20shall%20be,of%20a%20State%2C%20unless%20the](https://indiankanoon.org/doc/178204325/#:~:text=(1)No%20person%20shall%20be,of%20a%20State%2C%20unless%20the)

Subject:) Polity

Topic:) Constitution of India

Subtopic:)

Q.37)

Ans) a

Exp) Option a is the correct answer.

An adjournment motion is a procedure in Parliament that interrupts regular business to discuss a matter of urgent public importance. The purpose of an adjournment motion is to draw the House's attention to a matter and to request to discuss the matter immediately. It is not mentioned in the Constitution of India rather it is mentioned in the **Rules of Procedure and Conduct of Business in Lok Sabha**.

Statement 1 is incorrect. According to Rules 56 and 57 of the Rules of Procedure and Conduct of Business in Lok Sabha, a motion for an adjournment of the House's business is moved with the Speaker's consent to discuss a "definite matter of urgent public importance".

Notice of an adjournment motion shall be given by 10.00 hours on the day on which the motion is proposed to be made to the Secretary-General and copies thereof shall be endorsed to:– (i) the Speaker; (ii) the Minister concerned; (iii) the Minister of Parliamentary Affairs: Provided that notices, received after 10.00 hours shall be deemed to have been received at 10.00 hours on the next day on which the House sits.

Statement 2 is incorrect. According to Rules 58 (Restrictions on the Right to Move Motion), a Member of Parliament cannot move an adjournment motion if there has been a serious breach of his/her parliamentary privilege. A member moves a Privilege Motion (not the adjournment motion) when he believes that a minister has violated the House's or one or more of its members' privileges by

withholding facts from a case or by providing incorrect or distorted facts. Its goal is to censure the relevant minister. It can be moved in both the Rajya Sabha and the Lok Sabha.

Statement 3 is correct. As per Rule 59 (Restrictions on the right to move motion) of the Lok Sabha Rules of Procedure and Conduct of Business. The motions shall not deal with any matter which is under adjudication by a court of law having jurisdiction in any part of India; and the motion shall not raise any question which under the Constitution or these rules can only be raised on a distinct motion by a notice given in writing to the Secretary-General.

Source: <https://indianexpress.com/article/explained/everyday-explainers/adjournment-motion-manipur-congress-mp-8854464/>

https://eparlib.nic.in/bitstream/123456789/66/1/Rules_Procedure_LokSabha.pdf

Subject:) Polity

Topic:) Parliament

Subtopic:)

Q.38)

Ans) b

Exp) Option b is the correct answer.

Statement 1 is correct. The Section 2(b) of the Forest Rights Act, 2006 defines Critical Wildlife Habitats as follows: "**Critical Wildlife Habitat' means such areas of National Parks and Sanctuaries where it has been specifically and clearly established, case by case, on the basis of scientific and objective criteria, that such areas are required to be kept as inviolate for the purpose of wildlife conservation** as may be determined and notified by the Central Government in the Ministry of Environment, Forest and Climate Change after an open process of consultation by an Expert Committee, which includes experts from the locality appointed by that Government wherein a representative of the Ministry of Tribal Affairs shall also be included, in determining such areas.

Statement 2 is incorrect. The **Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (also known as the Forest Rights Act, 2006)**, introduces the concept of Critical Wildlife Habitats. **The term 'critical wildlife habitat' is defined only in the Forest Rights Act (FRA), 2006**, so CWH are determined and notified under this act and not under the Wildlife Protection Act, 1972.

Statement 3 is correct. According to **Section 2(b) of the FRA of 2006, the Ministry of Environment, Forest and Climate Change (MoEFCC) is responsible for determining and notifying Critical Wildlife Habitats (CWH).**

Statement 4 is incorrect. Section 4(2) of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (FRA Act 2006) **provides that forest rights of scheduled tribes and other traditional forest dwellers can be modified or they can be resettled outside the critical wildlife habitat under certain conditions.** The provisions mentioned under Section 4(2)(a) to (f) of FRA Act 2006 should be complied with to modify the rights or resettle them outside CWH.

Source:

<https://tribal.nic.in/downloads/FRA/Concerned%20Laws%20and%20Policies/Guidelines%20for%20Notification%20of%20Critical%20Wildlife%20Habitat,%202018.pdf> <https://www.thehindu.com/sci-tech/energy-and-environment/project-tiger-50-years-forest-rights-act-legal-crossfire-conflict-explained/article67715863.ece>

<https://pib.gov.in/newsite/PrintRelease.aspx?relid=69806#:~:text=The%20identification%20and%20declaration%20of,consent%20of%20the%20affected%20people.>

<https://tribal.nic.in/downloads/FRA/Concerned%20Laws%20and%20Policies/Guidelines%20for%20Notification%20of%20Critical%20Wildlife%20Habitat,%202018.pdf>

<https://www.indiacode.nic.in/bitstream/123456789/1726/1/a1972-53.pdf>

Subject:) Environment

Topic:) Protected Areas

Subtopic:)

Q.39)

Ans) a

Exp) Option a is the correct answer.

Article 360 of the Indian Constitution empowers the **President to proclaim a Financial Emergency** if the President is satisfied that a situation has arisen whereby the financial stability or credit of India or of any part of the territory thereof is threatened.

Statement 1 is incorrect: During the proclamation of financial emergency, the **President can direct States** requiring **all Money Bills or other Bills** to which the provisions of article 207 apply (not all bills passed by state legislatures) to be reserved for his/her consideration after they are passed by the Legislature of the State.

Statement 2 is correct: According to article 360 of the Indian constitution, it shall be competent for the President during the period any Proclamation issued under this article is in operation to issue directions for the reduction of salaries and allowances of all or any class of persons serving in connection with the affairs of the Union including the Judges of the Supreme Court and the High Courts.

Statements 3 and 4 are incorrect: The Constitution of India **neither empower the President of India to suspend Citizens' right to engage in any profession nor to impose new taxes without Parliamentary approval.**

Source: Laxmikanth - Emergency Provisions

Subject:) Polity

Topic:) Financial Emergency

Subtopic:)

Q.40)

Ans) d

Exp) Option d is the correct answer.

Article 20 of the Constitution of India provides that no person shall be convicted of an offense except for a violation of a law in force at the time of the act, nor face a penalty greater than that prescribed at the time of the offense. It also protects individuals from being prosecuted and punished for the same offense more than once and ensures that no person accused of an offense shall be compelled to be a witness against themselves.

Statement-I is incorrect. In India, documents obtained during a legal search and seizure can be presented in court as evidence, **even if they were taken without the accused's consent, if the search and seizure were conducted according to the law.**

Statement-II is correct. **Article 20(3) of the Constitution of India, which provides that no person accused of any criminal offense shall be compelled to be a witness against himself/herself.** This principle is known as the right against self-incrimination and is a fundamental right under the Indian Constitution.

Source: Laxmikant- Ch-7, Fundamental Rights

Subject:) Polity

Topic:) Fundamental Rights

Subtopic:)

Q.41)

Ans) a

Exp) Option a is the correct answer.

The head of a guild, or shreni, in ancient India at time of Buddha was called a **Jethaka or Jyeshtha**. The Jethaka was usually an influential person who had access to the king and was referred to by their occupation.

Early Buddhist literature points us to a Head-like figure called the 'Jetthaka'. This person was referred to by their occupation - for example, 'head of garland makers' guild (malakara jetthaka), 'head of carpenters' guild' (vaddhaki jetthaka) and so on. The Guild Head had considerable power in the structure. They could punish, banish, and fine members of the guild for wrongdoings. Usually, the position went to an experienced member of the guild.

Option b is incorrect: In ancient Indian history, the term bhojaka refers to a village headman who played a key role in the village's administration and governance.

Option c is incorrect: Ghatikas were educational institutions in ancient South India that were active during the rule of the Gangas, Pallava kings, and Satavahanas.

Option d is incorrect: Sarthavaha was a Sanskrit term that meant "**leader of the caravan**" or "**leader of the merchants.**" The Sarthavaha was an important figure in the trade and commerce of the Gupta period, and held a prominent position in society due to their wealth and influence.

Source: <https://ncert.nic.in/textbook/pdf/heih111.pdf>

<https://egyankosh.ac.in/bitstream/123456789/18807/1/Unit-23.pdf>

<https://www.shrenis.com/post/guilds-of-ancient-india-the-shreni-philosophy>

Subject:) Ancient India

Topic:) Shrenis

Subtopic:)

Q.42)

Ans) b

Exp) Option b is the correct answer.

Statement 1 is incorrect: A unique feature of Khajuraho style of temple architecture is not the stepped pyramid vimana. Khajuraho belongs to the Nagara school with curvilinear spires (shikharas). The Vimana, a stepped pyramid tower, is a unique feature of Dravida (South Indian) temple architecture

Statement 2 is correct: Erotic imagery is very common in the Temples of Khajuraho. These sculptures are believed to reflect the idea of female beauty and fertility. Other scenes depicted on the walls of the temples are a part of the Narathara (the human life cycle) signifying how sexual procreation and kama are an essential aspect of human life.

Statement 3 is correct: The **first mention of Khajuraho and its temples is in the accounts of Abu Rahyan al Biruni (1022 CE) and Ibn Batuta (1335 CE)**. The temples were said to have been spread across 20 square kilometres and there were around 85 temples in the 12th century.

Statement 4 is incorrect: The carvings at the temples seem to be predominantly about Hindu deities and mythology. Most famous examples include- Kandariya Mahadev Temple and Lakshaman Temple. The temple of Chausath Yogini in the western group of Temples, is dedicated to Hindu Goddess Kali.

There also exist Jaina Temples like Adinath Temple, Ghantai temple and Parsawanatha Jain Temple in Eastern Complex of the Temples of Khajuraho. Hence the **Temples of Khajuraho is not exclusively dedicated to Hindu Gods and Goddesses**

Source: Nitin Singhania, Chapter 1 INDIAN ARCHITECTURE, SCULPTURE AND POTTERY

<https://indianculture.gov.in/stories/temples-khajuraho>

Sansad ki Kala (ignca.gov.in)

Subject:) Art and Culture

Topic:) Architecture

Subtopic:)

Q.43)

Ans) b

Exp) Option b is the correct answer.

Pair 1 is incorrect. The **Kakatiya dynasty** was a prominent South Indian dynasty that ruled over the eastern Deccan region in present-day Telangana and Andhra Pradesh from the 12th to the 14th centuries.

Their capital was Orugallu, now known as Warangal. The Kakatiyas originally served as feudatories to the Western Chalukyas of Kalyani. The dynasty's rise to prominence began with Prola II, who declared independence from the Chalukyas and established the Kakatiya kingdom around 1163 CE.

1) Halebidu (Dwarasamudra) and Belur was capital of the Hoysala Empire in the 11th century CE.

Pair 2 is correct. The **Yadava dynasty**, also known as the Seuna or Sevuna dynasty, was a prominent medieval Indian dynasty that ruled over the Deccan region, primarily in present-day Maharashtra, parts of Karnataka, and Madhya Pradesh, from the 9th to the early 14th centuries. **The Yadavas originally served as feudatories under the Rashtrakuta and Western Chalukya dynasties. The dynasty's capital was Devagiri (modern Daulatabad).**

Pair 3 is correct. The **Chandelas of Jejakabhukti** were an Indian dynasty from Central India. Between the ninth and thirteenth centuries, the Chandelas ruled much of Bundelkhand (then known as Jejakabhukti). They were members of the Rajput clan Chandel. Initially, the Chandelas ruled as feudatories of the Gurjara-Pratiharas of Kanyakubja. Yashovarman, the 10th-century Chandela ruler, gained almost complete independence while still acknowledging Pratihara suzerainty. **The capital of the Chandelas was Khajuraho, renowned for its magnificent temple complex.**

Source- <https://ncert.nic.in/ncerts/l/gess103.pdf>

Ancient and Medieval India by Poonam Dalal Dahiya

Subject:) Ancient India

Topic:) Post Gupta

Subtopic:)

Q.44)

Ans) a

Exp) Option a is the correct answer.

Option a is correct: Uraiyur was **the capital of the early Cholas**, one of the three main kingdoms of ancient Tamil country. It was also known as Kozhiyur during the Sangam period, when it became a major business center. It was a famous center of cotton trade and production during the Sangam period. It was known for its skilled weavers who produced high-quality muslin fabric, which was in high demand in the ancient world for its softness, breathability, and lightness.

Option b is incorrect: Tondi was a **major port city of the Chera dynasty** in ancient India, located on the Malabar coast near Calicut. The Cheras ruled over large parts of modern-day Kerala, including the central and northern parts of the state and the Kongu region of Tamil Nadu. The Cheras' capital was Vanji, and their emblem was the "bow and arrow".

Option c is incorrect: Amaravati and Nagarjunakonda were **important Buddhist centers**, not trade centers. Both sites are known for their stupas, sculptures, and monasteries. On the other hand, **Tagar and Prathisthan were two important and famous trade centers and inland markets on the Dakshinapatha.**

Option d is incorrect: Arikamedu was an **Indo-Roman trading city** and one of the earliest known Indo-Pacific bead making centres. The site was mentioned in the Periplus of the Erythraean Sea an anonymous Greco-Roman text of the 1st century CE which described the known coastal landmarks and ports of the Indian Subcontinent's coastline.

Source: <https://ncert.nic.in/textbook/pdf/gess102.pdf>

<https://egyankosh.ac.in/bitstream/123456789/20152/1/Unit-24.pdf>

<https://en.unesco.org/silkroad/content/did-you-know-port-trade-centre-arikamedu-and-roman-exchange-indian-subcontinent#:~:text=Arikamedu%20was%20an%20Indo%2DRoman,of%20the%20Indian%20Subcontinent's%20coastline.>

<https://www.trichycorporation.gov.in/cityhistory#:~:text=Uraiyur%20was%20the%20capital%20of,surrounding%20monuments%20in%20Tamil%20Nadu.>

<https://www.trichycorporation.gov.in/cityhistory#:~:text=Uraiyur%20was%20the%20capital%20of,surrounding%20monuments%20in%20Tamil%20Nadu.>

Subject:) Ancient India

Topic:) Chola Dynasty

Subtopic:)

Q.45)

Ans) b

Exp) Option b is the correct answer.

Statement 1 is incorrect: Anandpal, a Hindu Shahi ruler, formed an alliance with the rulers of central and western India to fight against Mahmud of Ghazni in 1001 CE. **Anandpal was the son of Jaipal, a Jat ruler whose capital was Lahore.** In 1000 CE, Mahmud of Ghazni attacked modern Afghanistan and Pakistan, defeating Jaipal, who later committed suicide. Anandpal succeeded his father and continued to challenge Turkish raids in his territory.

Statement 2 is correct: Raja Dahir (663 – 712 CE) was the last Hindu ruler of Sindh. His kingdom was invaded in 711 CE by the Arab Umayyad Caliphate, led by Muhammad bin Qasim, where Dahir died while defending his kingdom.

Statement 3 is correct: Mohammed Ghori was **defeated by Raja Bhim II in the battle of Kayadara in 1178 CE near Mt. Abu.** After this defeat, he never turned to Gujarat later on. Bhimdev II was an Indian king who belonged to the Solanki dynasty and ruled parts of present-day Gujarat.

Statement 4 is incorrect: Chingiz Khan (Genghis Khan) reached at the north-west frontiers of India during the reign of Delhi Sultan Iltutmish (not Balban). The Mongol Empire during 1221-1327 came up with many invasions in the Indian subcontinent with many of the later raids were made by the unruly Qaraunas of Mongol origin. it was during the **reign of Iltutmish that the Mongols under Genghis Khan invaded India.**

Source: History of Medieval India by Satish Chandra.

<https://egyankosh.ac.in/bitstream/123456789/61924/1/Unit-11.pdf>

<https://egyankosh.ac.in/bitstream/123456789/73298/3/Theme-2.pdf>

Subject:) Medieval India

Topic:) Sultanate

Subtopic:)

Q.46)

Ans) c

Exp) Option c is the correct answer.

Pair 1 is correct. Prithviraj Raso is a folklore poem written by Chand Bardai. He was the court poet of Prithviraj Chauhan III (1168-1192 A.D). It documents the life of Prithviraj Chauhan and the challenges faced by him. According to Chand Bardai in "Prithviraj Raso," Prithviraj Chauhan was captured and blinded by Muhammad Ghori. Later, Ghori tested Prithviraj's legendary archery skills, and with a coded message from his poet Chand Bardai, Prithviraj successfully killed Ghori with a blind shot before committing suicide.

Pair 2 is incorrect. Kadambari is a Sanskrit prose composed by **Banabhata. He was the court poet of** Harsavardhana (7th century C.E.) of Pushyabhutis Dynasty. Kadambari is a lyrical prose romance that narrates the love story of Kadambari, a Gandharva princess, and Chandrapida, a prince who is eventually revealed to be the moon god.

Pair 3 is correct. "Svapna-vasavadatta" is a Sanskrit play attributed to the ancient Indian playwright **Bhasa during the reign of Kushanas in the 2nd Century CE**. The play is based on the romantic tale of King Udayana of Vatsa and Princess Vasavadatta, the daughter of King Pradyota of Avanti during the early 6th century BC.

Pair 4 is correct. Saundarananda, is a Sanskrit poetry written by **Ashvaghosha during the reign of Kushana Dynasty in the 2nd century CE**. The central theme of "Saundarananda" is the spiritual journey of Nanda, the half-brother of the Buddha, who embarks on a quest for enlightenment.

Source: Prithviraj Raso: http://econtent.ncert.org.in/wp-content/uploads/2019/02/September-2-Prithviraj_Chauhan.pdf

Kadambari: <https://www.penguin.co.in/book/kadambari/>

Svapna-vasavadatta and Saundarananda : A History of Ancient and Early Medieval India – Upinder Singh.

<https://egyankosh.ac.in/bitstream/123456789/64648/1/Unit1.pdf>

https://tnou.ac.in/wp-content/uploads/2022/12/MA-his-1-st-dem_compressed.pdf

https://nios.ac.in/media/documents/SrSec315NEW/History_Module1.pdf

https://ignca.gov.in/Asi_data/8942.pdf

https://ignca.gov.in/Asi_data/8956.pdf

<https://www.nios.ac.in/media/documents/SecICHCour/English/CH.06.pdf>

https://tnou.ac.in/wp-content/uploads/2022/12/MA-his-1-st-dem_compressed.pdf

Subject:) Art and Culture

Topic:) Literature

Subtopic:)

Q.47)

Ans) a

Exp) Option a is the correct answer.

Buddhist philosophy and doctrines, based on the teachings of Gautama Buddha, give meaningful insights about reality and human existence. The four noble truths are the most important principles of Buddhism. The four noble truths of Buddhism are

- 1) Life is Full of Suffering (Dukkha)
- 2) Suffering has a Cause (Dukkha samudaya)
- 3) Cessation of Suffering (Dukkha nirodha)
- 4) Ways to Destroy Suffering (Dukkha-nirodha-marga)

Option a is correct. The doctrine of Pratitya samutpada (dependent Origination) a fundamental Buddhist teaching on causation. **The doctrine of dependent origination is central to Buddhist philosophy and is connected to the second noble truth - suffering has a cause (Dukkha Samudaya).** According to Buddhism everything in this world has a cause. There is a cycle of twelve such causes and

corresponding effects which governs the entire life of human beings. It is called Bhavacakra, the cycle of existence.

Pratitya-samutpada is a middle path between sasvatvada (the principle of eternity) and uchedvada (the principle of annihilation). By maintaining a middle way between both these principles, pratitya-samutpada holds that things have existence but they are not eternal and they are not annihilated completely.

Option b is incorrect. Sasvatvada means some things are eternal, uncaused, and independent. It is, one of the two 'extreme views' condemned by the Buddha. It postulates the existence of a self (ātman) that is eternal and unchanging. According to the Buddha, Sasvatvada **misrepresent the reality of the situation** and the truth of the matter is to be found by reference to the principle of the 'Middle Way' (madhyamā-pratipad).

Option c is incorrect. Uchedvada means nothing remains after the destruction of things. It postulates the existence of a **self that is cut off and utterly destroyed at death.** According to the Buddha, both of these two extremes (Uchedvada and Sasvatvada) misrepresent the reality of the situation and the truth of the matter is to be found by reference to the principle of the 'Middle Way' (madhyamā-pratipad). Thus **the self is neither eternal nor is it cut off at death:** rather there is a dynamic continuity of the individual from one life to the next.

Option d is incorrect. Shunyavada of Buddhism holds that the **Ultimate reality is Shunyam.** Neither the external world nor the inner world of ideas is real. By 'Shunyam', Nagarjuna means **indescribable nature of Reality.**

Source: <https://timesofindia.indiatimes.com/speaking-tree/yoga-meditation/from-mortal-prince-to-the-immortal-buddha/articleshow/106352302.cms>

<https://www.egyankosh.ac.in/bitstream/123456789/35230/1/Unit-4.pdf>

<https://ncert.nic.in/textbook/pdf/keks102.pdf>

Subject:) Ancient India

Topic:) Buddhist

Subtopic:)

Q.48)

Ans) c

Exp) **Option c is the correct answer.**

The Pala dynasty was a prominent Indian dynasty that ruled over parts of the Indian subcontinent, primarily in the eastern regions, from the 9th to the 12th centuries CE. The dynasty is renowned for its patronage of Buddhism, support for education and learning, and contributions to Indian art, architecture, and culture.

Statement a is correct. Buddhist university at Odantapuri was established during the reign of Palas of Bengal. Across various historians it is contested that it was established either during the reign of Gopala I (750 - 775 AD) or Dharmapala (775- 810 AD). It served as an excellent hub for philosophical and Buddhist studies.

Statements b and d are correct. Dharmapala (775- 810 AD) of Pala dynasty founded the Vikramshila university near Bhagalpur in Bihar. He also founded the **Somapuri monastery (near Paharpur, Bihar).**

Statement c is incorrect. Vallabhi University was founded around 600 CE in modern Gujarat by the Maitraka dynasty (5th - 8th century C.E.). Hieun Tsang visited Vallabhi during his pilgrimage journey to Indian sub-continent.

Source: BHIC-105 English.pmd (egyankosh.ac.in)

<https://www.egyankosh.ac.in/bitstream/123456789/73906/1/Unit-15.pdf>

Subject:) Medieval India

Topic:) Palas Subtopic:)

Q.49)

Ans) c

Exp) Option c is the correct answer.

The Delhi Sultanate(1206 to 1526) was established in 1206 by Qutb-ud-din Aibak, a Turkic slave-commander who carved out a Sultanate following victories by the Ghurid dynasty.

Option a is incorrect. Iltutmish (1211 to 1236) of Slave Dynasty, also known as the Mamluk Dynasty (**not Qutbuddin Aibak**) organized the Turkan-i-Chahalgani or the 'Group of Forty'.

All these nobles were drawn from the Turkish nobility.

Option b is incorrect. Turkan-i-Chahalgani **were a group of forty Turkish amirs (nobles)**. After the death of Iltutmish, this group assumed great power in its hands. **It was not related to the iqtadars.**

Option c is correct. The sultan selected persons from this Forty for appointments in military and civil administration. **These Turkish amirs (nobles) advised and helped the Sultan in administering the Sultanate.**

Option d is incorrect. **Turkan-i-Chahalgani** assumed great powers after death of Iltutmish i.e., during the reign of Bahram Shah. In the absence of rule of primogeniture, the nobles sided with any claimants to the throne and either helped in the choice of the Sultan or contributed to the de-stabilization of the regime. **Balban (1266-1287)** was determined to break the power of the Chahalgani. To keep himself well informed, Balban appointed spies in every department. Balban abolished the Corps of Forty and thereby put an end to the domination of "Turkish nobles".

Source: History of Medieval India- Satish Chandra

https://nios.ac.in/media/documents/SrSec315NEW/315_History_Eng/315_History_Eng_Lesson9.pdf

Subject:) Medieval India

Topic:) Sultanate

Subtopic:)

Q.50)

Ans) c

Exp) Option c is the correct answer.

Option a is incorrect. The interest charged by moneylenders to the ryots was exorbitant. Many a times interest was more than the principal amount. The ryots complained of moneylenders manipulating laws and forging accounts. So in **1859** the British passed a **Limitation Law** that stated that the loan bonds signed between moneylenders and ryots would have validity for only three years. This law was meant to **check the accumulation of interest over time.**

Option b is incorrect. The Deccan Riots of 1875 were targeted at destroying the mortgage deeds and sale-deeds issued by moneylenders. In order to placate the peasants, in **1879**, **Deccan Agriculturists' Relief Act** was passed to **prevent the imprisonment of peasants in case of failure in payment of debt.**

Option c is correct. The **1856 Summary Settlement in Awadh** reflected a **centralizing impulse by the British East India Company.** They sought to **eliminate the Talukdars**, a powerful landowning class, who functioned as intermediaries in revenue collection. This aimed to **establish a more direct and efficient system** for maximizing government revenue from the peasantry.

Option d is incorrect. In 1859 the **Bengal Rent Act** was enacted. It imposes **restrictions on the power of landlords' to increase rent or evict tenants.** But protection granted to the tenants was also restrictive as it only protected fixed rent tenant who could prove that they had cultivated the land for 12 consecutive years.

Source: Plassey to Partition – chapter 3- Page 173

<https://ncert.nic.in/ncerts/l/lehs302.pdf>

<https://ncert.nic.in/ncerts/l/lehs301.pdf>
<https://indiankanoon.org/doc/82448506/>
<https://amritmahotsav.nic.in/district-repository-detail.htm?19530>
<https://egyankosh.ac.in/bitstream/123456789/95973/2/Unit-2.pdf>
Subject:) Modern India
Topic:) Revolt of 1857
Subtopic:)

Q.51)

Ans) a

Exp) Option a is the correct answer.

Option 1 is incorrect: Unto this Last, written by John Ruskin, is an outcry against injustice and inhumanity and a closely argued assault on the science of political economy, which dominated the Victorian period.

Gandhi in his autobiography- The Story of My Experiments with Truth, in a chapter titled 'The magic spell of a book' and says **this was the book (Unto this Last) "that brought about an instantaneous and practical transformation in my life"**. This was because he "discovered some of my deepest convictions reflected in this great book".

Gandhi summarised Unto This Last's teachings in these three points:

- 1) That the good of the individual is contained in the good of all.
- 2) That a lawyer's work has the same value as the barber's, in as much as all have the same right of earning their livelihood from their work.
- 3) That a life of labour, i.e., the life of the tiller of the soil and the handicraftsman, is the life worth living.

Option 2 is incorrect: In response to the controversial book "Mother India" by Katherine Mayo in 1927, Lala Lajpat Rai authored "Unhappy India" in 1928. Mayo's book promoted White Supremacy and White men's burden theory, and portrayed Indians as inferior, justifying British domination.

Lala Lajpat Rai in Unhappy India debunked Mayo's arguments, attributing Britisher's responsible for **India's socio-economic issues** and exposing the generalizations made by Mayo. Through "Unhappy India," Lajpat Rai aimed to refute Mayo's portrayal of India and appeal to Western audiences, especially Americans, to support India's demand for self-rule.

Option 3 is correct: Hind Swara Published in 1909, this foundational text written by Gandhiji offers critique to Western Industrialization and **advocates for decentralization and Indian self-rule (Swaraj)** based on principles of nonviolence, self-reliance, and moral values.

Gandhi also argues for the importance of traditional Indian values and the need for a more sustainable and spiritually rich way of life.

Despite being labeled as **"seditious literature" by the colonial government and banned within a year of its publication in 1910**, Hind Swaraj endured as an inspirational document for many freedom fighters.

Option 4 is correct: The Indian States Problem is a book authored by **Mahatma Gandhi**, published in **1941**. The book delves into the complex issue of princely states in India during the time of British colonial rule.

Gandhi's book discusses **various aspects related to the Indian states, including their political status, governance, and the need for their integration into a unified India**. His views on non-violence, self-reliance, and the role of the princely states in the broader context of India's struggle for independence are also explored.

Option 5 is incorrect: A Nation in Making" is the autobiography of Surendranath Banerjee, published in **1925**. The book recounts Banerjee's life and political activities up to 1924. It covers significant events such

as the formation of the Indian Association and Indian National Congress, as well as Banerjee's role in the Swadeshi movement and anti-partition agitation. The autobiography also highlights the importance of the press in the freedom struggle and immortalizes the contributions of Banerjee's contemporaries.

Source: <https://amritmahotsav.nic.in/district-repository-detail.htm?9641>

<https://timesofindia.indiatimes.com/life-style/books/features/5-books-written-by-mahatma-gandhi-everyone-must-read/photostory/104045297.cms>

<https://amritmahotsav.nic.in/district-repository-detail.htm?7442>

https://loksabhadocs.nic.in/dignitaries_file/Mahatma_Gandhi.pdf

Subject:) Modern India

Topic:) Personalities

Subtopic:)

Q.52)

Ans) b

Exp) Option b is the correct answer.

The Government of India has launched 'Mission Shakti', an Integrated Women Empowerment Programme, as Umbrella Scheme for the Safety, Security and Empowerment of Women for implementation during 2021-22 to 2025-26. Mission Shakti has two sub-schemes 'Sambal' and 'Samarthya'. While the "Sambal" sub-scheme is for safety and security of women, the "Samarthya" sub-scheme is for empowerment of women.

Option 1 is correct: Nari Adalats is included in the Sambal sub-scheme, focusing on women's safety and security. It is a new sub-component for providing women with an alternate grievance redressal mechanism though a women collective comprising of 7 - 11 socially respectable women of the local community for resolving cases of petty nature such as harassment, subversion, curtailment of rights or entitlements etc.

Option 2 is incorrect: Janani Suraksha Yojna is not a sub-scheme under Mission Shakti. Janani Suraksha Yojana (JSY) aims to reduce maternal and infant mortality by encouraging pregnant women to give birth in medical institutions.

Option 3 is incorrect: Mahila Samman Certificate is not part of Mission Shakti. It is a government-backed savings scheme for women and girls of all ages. It was introduced in the Budget 2023-24 to encourage women to save money and build financial independence.

Option 4 is correct: Beti Bachao Beti Padhao program falls under the Sambal sub-scheme, addressing the decline in Child Sex Ratio. It will be the main initiative for behavioral and mindset change. It is being expanded to cover all districts of the nation and upscaled so as to be the main initiative for behavioral and mindset change.

Option 5 is correct: Pradhan Mantri Matru Vandana Yojana is included in Mission Shakti under Samarthya - for empowerment of women. The scheme mainly aims to compensate for loss of wages due to pregnancy and childbirth. It would also contribute to better care of pregnant women, lactating mothers and the newborn.

Option 6 is incorrect: Mission Vatsalya is not part of Mission Shakti. It is an umbrella scheme for child protection services in India. It aims to secure a healthy and happy childhood for every child in the country.

Knowledge Base:

Mission Shakti Components

Sambal (Safety & Security)

1) **One Stop Centres (OSCs):** Integrated support for legal, psycho-social counselling, information etc.

2) **Women Helpline (WHL)**: Toll-free emergency response system (181). Integrated with OSCs and other helplines.

3) **Beti Bachao Beti Padhao (BBBP)**: Social change campaign for valuing girls.

4) **Nari Adalat**: Women's collective for resolving local disputes.

Samarthya (Empowerment)

1) **Shakti Sadan**: Homes and support for women facing destitution, including trafficking victims. (Integrates Swadhar Greh & Ujjwala)

2) **Sakhi Niwas**: Safe hostels for working women (Expands on Working Women Hostels).

3) **Palna (National Creche Scheme)**: Safe childcare for working mothers.

4) **Pradhan Mantri Matru Vandana Yojana (PMMVY)**: Financial support for pregnant and lactating mothers (covers second girl child).

5) **National/State/District Hubs for Empowerment of Women (NHEW/SHEW/DHEW)**: Coordination, convergence, research & gap-funding for women's empowerment.

Source: [https://g20empower-india.org/en/home/mission-details/shakti#:~:text=\(B\)%20Samarthya%20%E2%80%93%20for%20empowerment,including%20women%20victims%20of%20trafficking](https://g20empower-india.org/en/home/mission-details/shakti#:~:text=(B)%20Samarthya%20%E2%80%93%20for%20empowerment,including%20women%20victims%20of%20trafficking).

<https://www.thehindu.com/news/national/lack-of-protection-officers-for-domestic-violence-cases-intrigues-sc-about-mission-shakti/article66557250.ece>

Subject:) Social Issues

Topic:) Government Schemes

Subtopic:)

Q.53)

Ans) c

Exp) Option c is the correct answer.

Statement I is correct: Goldene has achieved the distinction of being the **first free-standing 2D metal**. It shares some similarities with graphene, such as being a 2D material. Different research show that the Goldene has potential applications in the fields of carbon dioxide conversion, hydrogen-generating catalysis, selective production of value-added chemicals, **hydrogen production, water purification, etc.**

Statement II is incorrect: Goldene consists of a **single layer material, made of gold atoms arranged in a two-dimensional (2 D) structure (not four-dimensional structure)**. This makes gold the first metal to be formulated into (freestanding) 2D sheets – opening up a host of exciting possibilities for the future.

Knowledge base:

1) Goldene is a two-dimensional free-standing sheet of gold that is only one atom thick.

2) **Scientists used a chemical called Murakami's Reagent to create Goldene.**

3) Unlike gold, Goldene can act as a semiconductor.

Source: <https://indianexpress.com/article/explained/explained-sci-tech/goldene-a-sheet-of-gold-that-is-only-one-atom-thick-9310360/>

<https://forumias.com/blog/development-of-goldene/>

Subject:) Science & Tech

Topic:) Goldene

Subtopic:)

Q.54)

Ans) c

Exp) Option c is the correct answer.

Ultrasounds are high frequency waves. Ultrasounds are able to travel along well-defined paths even in the presence of obstacles. Ultrasounds are used extensively in industries and for medical purposes.

Option 1 is correct: Ultrasound scanner is an instrument which uses **ultrasonic waves for getting images of internal organs of the human body**. A doctor may image the patient's organs such as the liver, gall bladder, uterus, kidney, etc. In this technique the ultrasonic waves travel through the tissues of the body and get reflected from a region where there is a change of tissue density. These waves are then converted into electrical signals that are used to generate images of the organ. These images are then displayed on a monitor or printed on a film. This technique is called 'ultrasonography'.

Option 2 is incorrect: Ultrasound is **not used to generate electricity in power plants**. It deals with sound waves, not electricity generation. It can be used to detect flaws in equipment used in power plants.

Option 3 is correct: Ultrasound is generally **used to clean parts located in hard-to-reach places, for example, spiral tube, odd-shaped parts, electronic components etc**. Objects to be cleaned are placed in a cleaning solution and ultrasonic waves are sent into the solution. Due to the high frequency, the particles of dust, grease and dirt get detached and drop out. The objects thus get thoroughly cleaned. For instance, dental instruments are cleaned using the ultrasound technology to maintaining optimal cleanliness and safety.

Option 4 is correct: Ultrasounds **can be used to detect cracks and flaws in metal blocks**. Metallic components are generally used in construction of big structures like buildings, bridges, machines and also scientific equipment. The cracks or holes inside the metal blocks, which are invisible from outside reduces the strength of the structure. Ultrasonic waves are allowed to pass through the metal block and detectors are used to detect the transmitted waves. If there is even a small defect, the ultrasound gets reflected back indicating the presence of the flaw or defect.

Source: <https://ncert.nic.in/ncerts/1/iesc112.pdf>

Subject:) General Science

Topic:) Applied Physics

Subtopic:)

Q.55)

Ans) b

Exp) Option b is the correct answer.

Statement 1 is correct: The Internet of Things (IoT) is a **network of physical devices**, vehicles, appliances, and other **objects that can collect, exchange, and analyze data over the internet**. These devices are also known as "smart objects" and can include mechanical and digital machines, consumer objects, and anything with a sensor assigned a unique identifier (UID).

Statement 2 is correct: Web of Things (WoT) uses **existing web standards to enable seamless communication between connected devices and web applications**. The WoT is a subset of the Internet of Things (IoT) that uses web standards to integrate and connect physical objects. The WoT's goal is to extend existing web techniques and tools to IoT networks, and to reuse existing web protocols to communicate.

Statement 3 is incorrect: Cloud of Things (CoT) relies on **cloud computing for data storage, processing, and analysis. It's not about local data processing on individual devices**. Cloud of Things (CoT) refers to integration of Internet of Things (IoT) with Cloud Computing (CC). Cloud of Things is a high-performance cloud-based IoT application platform which allows remotely monitor, manage and control the IoT enabled devices.

Edge computing is a distributed computing framework that brings enterprise applications closer to data sources such as IoT devices or local edge servers.

Source: <https://indianexpress.com/article/technology/tech-news-technology/internet-of-things-let-devices-do-the-talking/>

<https://www.ibm.com/topics/internet-of-things>

<https://www.w3.org/TR/wot-usecases/>

[https://medium.com/@arashtad/introduction-to-cloud-of-things-81213e8c79bf#:~:text=The%20Cloud%20of%20Things%20\(CoT,adoption%20and%20overcome%20IoT%20challenges.](https://medium.com/@arashtad/introduction-to-cloud-of-things-81213e8c79bf#:~:text=The%20Cloud%20of%20Things%20(CoT,adoption%20and%20overcome%20IoT%20challenges.)

0challenges.

Subject:) Science & Tech

Topic:) New Technology

Subtopic:)

Q.56)

Ans) a

Exp) Option a is the correct answer.

Pair 1 is incorrect: The Magellanic Clouds are composed of two irregular galaxies, the Large Magellanic Cloud (LMC) and the Small Magellanic Cloud (SMC), which orbit the Milky Way once every 1,500 million years and each other once every 900 million years. The closest LMC is ~168,000 light-years from Earth. Both galaxies can be observed with the naked eye in the southern night sky.

Pair 2 is incorrect: Meteor is a bright streak of light in the sky caused when a meteoroid enters the Earth's atmosphere. The streak of light is produced from heat generated by the friction when the meteoroid travels into the Earth's atmosphere. **A meteorite is a solid piece of debris from an object, such as a comet, asteroid, or meteoroid,** that originates in outer space and survives its passage through the atmosphere to **reach the surface of a planet or moon.**

Pair 3 is correct: Gamma rays are that part of the electromagnetic spectrum with the highest energy and can cause serious damage when absorbed by living cells. Gamma-Ray Burst (GRB) is a brief, intense, and powerful burst of gamma rays, the highest-energy, shortest-wavelength radiation in the electromagnetic spectrum. These bursts result from the **merger of two neutron stars into a new black hole, or the merger of a neutron star and a black hole to form a larger black hole.**

Pair 4 is correct: Comets are large objects made of dust and ice that orbit the Sun. They are cosmic snowballs of frozen gases, rock, and dust that orbit the Sun. When close to the Sun, they heat up, releasing dust and gases to form a glowing head and a tail stretching millions of miles. There are likely billions of comets in the **Kuiper Belt and the Oort Cloud.**

Pair 5 is incorrect: Quasar is the brightest type of active galactic nucleus, believed to be powered by a supermassive black hole. The word "quasar" is derived from quasi-stellar radio source, because this type of object was first identified as a kind of radio source. Quasars also are called quasi-stellar objects (QSOs). Thousands of quasars have been observed, all at extreme distances from our galaxy.

Source: <https://www.thehindu.com/sci-tech/science/in-a-first-a-newborn-stars-spinning-disk-is-seen-in-another-galaxy/article67590245.ece>

<https://ncert.nic.in/ncerts/l/hesc117.pdf>

<https://www.thehindu.com/sci-tech/science/ferocious-black-holes-quasar-reveal-time-dilation-in-early-universe/article67040584.ece>

<https://www.thehindu.com/sci-tech/science/gamma-ray-burst-in-faraway-galaxy-disturbed-earths-upper-atmosphere/article67544907.ece>

<https://ares.jsc.nasa.gov/meteorite-falls/what-are-meteorites/>

Subject:) Science & Tech

Topic:) Space Subtopic:)

Q.57)

Ans) b

Exp) Option b is the correct answer.

Global space endeavors encompass a wide range of activities and missions carried out by various countries and private organizations aimed at exploring space, advancing scientific knowledge, and developing space technologies. Following is some of the important space missions:

Option a is incorrect: Various countries having human spaceflight program of their own:

1) **The United States** has both public (National Aeronautics and Space Administration-NASA) and commercial (SpaceX, Blue Origin) human spaceflight programs,

2) **China** has a robust public human spaceflight program, with China National Space Administration (CNSA) sending astronauts (taikonauts) to space and operating the Tiangong space station.

3) **Russia's** Roscosmos has a longstanding human spaceflight program, it became the first to send human to space (Yuri Gagarin, 1957).

4) Now in **India** also ISRO also set up a coordinating body for Gaganyaan called the Human Space Flight Centre (HSFC) for the space mission by the end of 2024.

While Japan has not independently launched human spaceflights, it collaborates with other space agencies and has sent astronauts to the International Space Station using American and Russian spacecraft.

Option b is correct: Chandrayaan-3 is the first mission in the world to soft-land on the lunar south pole, a region that has never been explored before. The mission aimed to demonstrate safe and soft lunar landing, rover mobility, and in-situ scientific experiments.

It is important to note here that India is the **fourth country after the United States, Russia, and China to successfully land on the Moon, but the first to land on the south pole of the Moon.**

Option c is incorrect: China's Tiangong space station is in orbit, and it is fully-functioning with astronauts on board. **Tiangong space station is China's own space station i.e. China has built and managed Tiangong without depending on other countries for funds or personnel.**

On the other hand, the International Space Station (ISS) **is a collaboration** between the space agencies of the **United States, Russia, Europe, Japan, and Canada.**

Option d is incorrect: Falcon 9 is a reusable, two-stage rocket **designed and manufactured by SpaceX, a private enterprise (not by NASA).** **Falcon 9 is the world's first orbital class reusable rocket.** Reusability allows SpaceX to reuse the most expensive parts of the rocket, which in turn drives down the cost of space access.

Source: <https://www.thehindu.com/sci-tech/science/gaganyaan-the-mission-to-send-indians-to-space-is-on-track/article66729781.ece>

<https://www.bbc.com/news/world-asia-india-67166633>

<https://indianexpress.com/article/opinion/editorials/express-view-on-chandrayaan-3-asking-for-the-moon-and-getting-it-8906328/#:~:text=accomplish%20a%20soft-,landing,-on%20the%20lunar>

<https://www.nasa.gov/international-space-station/space-station-international-cooperation/#:~:text=United%20States%2C%20Russia%2C-,Europe,-%2C%20Japan%2C%20and%20Canada>

<https://www.nasa.gov/launch-services-program-rockets/#:~:text=two%2Dstage%20rocket-,designed,-and%20manufactured%20by>

Subject:) Science & Tech

Topic:) Space

Subtopic:)

Q.58)

Ans) d

Exp) Option d is the correct answer.

Aircraft carriers are extremely strong and have powerful weapons. An aircraft carrier offers a wide range of strategic benefits including surveillance, air defence, airborne early warning, protection of Sea Lines of Communication (SLOC), and anti-submarine warfare.

Statement 1 is incorrect: Currently, India has **two operational Naval aircraft carriers** namely the INS Vikramaditya and INS Virant. The **INS Vikramaditya is the Russian-made aircraft carrier**. On the other hand, the **INS Vikrant was built in India** by the Cochin Shipyard Limited (CSL) in Kochi, **with an overall indigenous content of 76%**.

Statement 2 is incorrect: **INS Vikramaditya is over 285 meters** long and 60 meters wide, making it the **biggest ship in the Indian Navy and the INS Vikrant is a 262-metre-long carrier**. **INS Vikramaditya is equipped with short take-off but arrested recovery (STOBAR) operations, using a ski-jump ramp instead of a catapult system**. In aviation, Ski-jump is an **upward-curved ramp** that allows aircraft to take off from a runway that is shorter than the aircraft's required take-off roll.

In Catapult-assisted take-off but arrested-recovery (CATOBAR) system, which is used in INS Vikrant, the deck of the carrier is totally flat. The frontal wheel of the aircraft is placed on the moving part of the catapult which is above the deck. Once the energy is released, it moves and achieves **great speed in a short distance and time**. There are two types of catapult systems – steam-powered, and **electromagnetic ones called EMALS**. While the former uses steam pressure to fire catapults, EMALS uses linear induction motors. The electromagnetic force generated is used to launch the aircraft.

Source: <https://www.thehindu.com/news/national/the-significance-of-carrier-aviation-explained/article68118801.ece>

https://www.business-standard.com/external-affairs-defence-security/news/can-india-match-china-s-aircraft-carrier-numbers-rajnath-singh-answers-124051600837_1.html

<https://pib.gov.in/FeaturesDeatils.aspx?NoteId=151135&ModuleId%20=%202>

<https://www.iiss.org/en/online-analysis/military-balance/2022/09/indias-aircraft-carrier-arrival-the-limits-of-ambition/#:~:text=ship.%C2%A0%20%C2%A0%0A%0ABoth%20ships-,are,-also%20constrained%20by>

Subject:) Science & Tech

Topic:) Defence Technology

Subtopic:)

Q.59)

Ans) c

Exp) Option c is the correct answer.

Statement 1 is correct: **Burning plastic releases dioxins, a persistent organic pollutants that accumulate in the environment and human body. Dioxins disrupt the thyroid system**, interfering with hormone regulation, leading to metabolic, developmental, and reproductive issues. This poses significant health risks, including altered growth, cognitive deficits, and increased cancer risk.

Statement 2 is correct: Burning plastic releases **mercury**, which plants absorb through roots and leaves. Mercury disrupts chlorophyll synthesis and damages chloroplasts, causing oxidative stress. This **leads to chlorosis, characterized by the yellowing of leaves** due to the breakdown of chlorophyll, impairing photosynthesis and overall plant health.

Statement 3 is correct: Burning plastic releases **furans**, colorless and flammable chemicals that impact animal reproduction and development. **Furans are known to disrupt hormonal systems, potentially**

leading to reduced fertility, developmental delays, and birth defects in offspring. These effects highlight the risks posed by furan exposure to animal populations and ecosystems.

Source: <https://www.thehindu.com/news/cities/Tiruchirapalli/burning-of-solid-waste-a-cause-of-concern/article33783636.ece#:~:text=It%20further%20liberates%20hazardous%20halogens,and%20damages%20the%20nervous%20system.>

<https://www.who.int/news-room/fact-sheets/detail/dioxins-and-their-effects-on-human-health>

<https://www.unep.org/news-and-stories/story/plastic-bag-bans-can-help-reduce-toxic-fumes>

<https://archive.epa.gov/epawaste/hazard/wastemin/web/pdf/dioxfura.pdf>

<https://www.epa.gov/pcbs/learn-about-polychlorinated-biphenyls>

Subject:) Environment

Topic:) Environmental Pollution

Subtopic:)

Q.60)

Ans) b

Exp) Option b is the correct answer.

The International Renewable Energy Agency (IRENA) is an intergovernmental organisation that supports countries in their transition to a sustainable energy future. The IRENA produces comprehensive, reliable datasets on renewable energy capacity and use worldwide.

Statement 1 is incorrect: According to the International Renewable Energy Agency - Renewable capacity statistics 2023, **India stands 4th globally (not second) in Renewable Energy Installed Capacity.**

Statements 2 and 3 are correct: As per International Renewable Energy Agency - Renewable capacity statistics 2023, India stands **4th globally in Wind Power capacity and 5th in Solar Power capacity.** India's total capacity of Wind power stands at 46.16 GW and Solar Power stands at 82.63 GW at the end of April 2024.

Source:

<https://pib.gov.in/PressReleasePage.aspx?PRID=1992732#:~:text=India%20stands%204th%20globally%20in,%2D%20Renewable%20capacity%20statistics%202023>

<https://www.investindia.gov.in/sector/renewable-energy#:~:text=As%20of%20Apr-,2024,-%2C%20Renewable%20energy%20sources>

Subject:) Science & Tech

Topic:) Energy

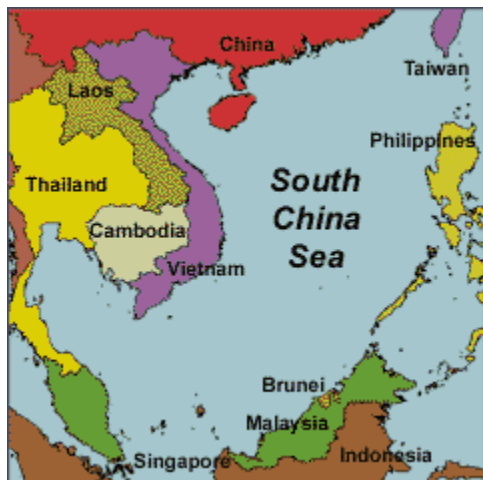
Subtopic:)

Q.61)

Ans) b

Exp) Option b is the correct answer.

South China Sea is the arm of the western Pacific Ocean that borders the Southeast Asian mainland. It is bounded on the northeast by the Taiwan Strait (by which it is connected to the East China Sea); on the east by Taiwan and the Philippines; on the southeast and south by Borneo, the southern limit of the Gulf of Thailand, and the east coast of the Malay Peninsula; and on the west and north by the Asian mainland.



Option 2, 3, 4 and 5 are correct: The bordering states & territories (clockwise from north) are as follows: the **People's Republic of China, Taiwan, the Philippines, Malaysia, Brunei, Indonesia, Singapore and Vietnam.**

Option 1 and 6 are incorrect: Laos is a **landlocked country and doesn't border the South China Sea.** Vietnam, Philippines, Indonesia, Malaysia all border the South China Sea. Maldives is an Island country in South Asia in the Indian Ocean. **The Maldives is located southwest of Sri Lanka and India. South China Sea is east of Sri Lanka and India.**

Source: <https://indianexpress.com/article/explained/explained-global/south-china-sea-dispute-8957602/>

Subject:) International Relations

Topic:) Countries and their borders

Subtopic:)

Q.62)

Ans) a

Exp) **Option a is the correct answer.**

The thermosphere is a layer of Earth's atmosphere that is directly above the mesosphere and below the exosphere. It extends from about 90 km (56 miles) to between 500 and 1,000 km (311 to 621 miles) above Earth's surface.

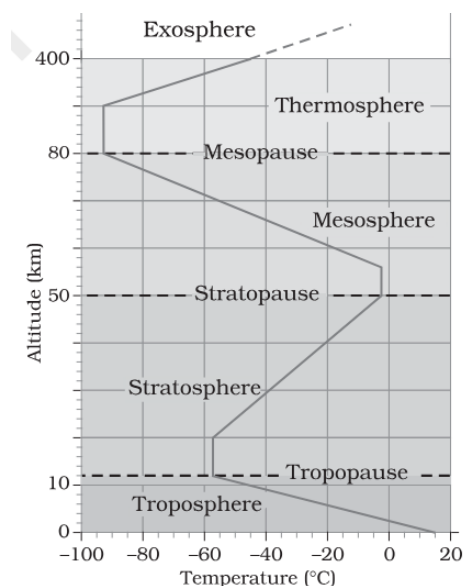
Option a is correct: The aurora, or Northern and Southern Lights primarily **occur in the thermosphere.** In the Northern Hemisphere, the phenomenon is called the **northern lights (aurora borealis)**, while in the Southern Hemisphere, it's called the **southern lights (aurora australis).**

High-energy solar photons tear electrons away from gas particles in the thermosphere, creating electrically charged ions of atoms and molecules. Auroras are natural light displays that appear as curtains, rays, spirals, or flickers in the sky. They're caused by disturbances in the Earth's magnetosphere caused by solar wind.

Option b is incorrect: In the thermosphere temperature rises very rapidly with increasing height.

Option c is incorrect: **Most of the Meteoroids burn up in the Mesosphere** as they enter Earth's atmosphere, due to friction from the air. The mesosphere's thick gases slow down meteoroids as they enter the atmosphere, causing them to burn up due to friction with gas molecules.

Option d is incorrect: The **troposphere is the densest layer of Earth's atmosphere** because of compression from the layers above it. It contains 80% of the atmosphere's mass and extends from the Earth's surface to a height of 8-14.5 kilometers.



Source: <https://ncert.nic.in/ncerts/l/gess204.pdf>

<https://www.ncert.nic.in/ncerts/l/kegy208.pdf>

<https://ncert.nic.in/textbook/pdf/kegy2gl.pdf>

<https://www.noaa.gov/jetstream/atmosphere/layers-of-atmosphere#:~:text=The%20gases%20in%20the%20mesosphere%20are%20now,the%20mesosphere%20are%20considered%20the%20middle%20atmosphere.>

[https://scied.ucar.edu/learning-zone/atmosphere/thermosphere#:~:text=Finally%2C%20the%20aurora%20\(the%20Southern,them%20into%20higher%20energy%20states.](https://scied.ucar.edu/learning-zone/atmosphere/thermosphere#:~:text=Finally%2C%20the%20aurora%20(the%20Southern,them%20into%20higher%20energy%20states.)

[https://scied.ucar.edu/learning-zone/atmosphere/thermosphere#:~:text=Finally%2C%20the%20aurora%20\(the%20Southern,them%20into%20higher%20energy%20states.](https://scied.ucar.edu/learning-zone/atmosphere/thermosphere#:~:text=Finally%2C%20the%20aurora%20(the%20Southern,them%20into%20higher%20energy%20states.)

[https://scied.ucar.edu/learning-zone/atmosphere/thermosphere#:~:text=Finally%2C%20the%20aurora%20\(the%20Southern,them%20into%20higher%20energy%20states.](https://scied.ucar.edu/learning-zone/atmosphere/thermosphere#:~:text=Finally%2C%20the%20aurora%20(the%20Southern,them%20into%20higher%20energy%20states.)

[https://scied.ucar.edu/learning-zone/atmosphere/thermosphere#:~:text=Finally%2C%20the%20aurora%20\(the%20Southern,them%20into%20higher%20energy%20states.](https://scied.ucar.edu/learning-zone/atmosphere/thermosphere#:~:text=Finally%2C%20the%20aurora%20(the%20Southern,them%20into%20higher%20energy%20states.)

Subject:) Geography

Topic:) Earth's Atmosphere

Subtopic:)

Q.63)

Ans) a

Exp) Option a is the correct answer.

Statement 1 is correct: A Dark Sky Reserve (DSR) is a large area with exceptionally clear starry nights and a well-preserved night environment, protected for scientific, natural, educational, cultural, and public enjoyment purposes. Dark Sky Reserves are designated areas where efforts are made to minimize light pollution, to protect the quality of the night sky for astronomical observation, wildlife, and human well-being. These areas have regulations and policies in place to control artificial light interference, by using methods like shielded fixtures to limit the intensity and duration of artificial light.

Statement 2 is incorrect: The Dark Sky International formerly known as International Dark-Sky Association (IDA), a USA based non-profit organisation is responsible for designating Dark Sky Reserves. UNESCO has no role in designating Dark Sky Reserves. The IDA evaluates candidate sites based on specific criteria related to the quality of the night sky and the efforts made to preserve it. Once a site meets the necessary requirements, it can be officially designated as a Dark Sky Reserve by the IDA.

Statement 3 is incorrect: India's first Dark Sky Reserve was established in 2022 in Hanle, located in the Changtang region of Ladakh, and not in Namdhapha National Park (Arunachal Pradesh). Hanle is known

for its exceptionally clear and unpolluted night skies, making it an ideal location for astronomical observations.

Source: <https://www.thehindu.com/sci-tech/science/india-to-have-first-astronomy-dark-reserve-in-ladakh/article65849890.ece>

<https://www.discoveryinthedark.wales/about/dark-skies-organisations>

Subject:) Science and Technology

Topic:) Space

Subtopic:)

Q.64)

Ans) b

Exp) Option b is the correct answer.

Statement 1 is correct: Urban forests are not confined solely to woodlands, isolated trees, or tree groups within urban areas. Instead, they encompass all forms of green spaces adorned with woody trees. This includes fragmented forest patches or pockets, trees in parks and gardens, remnants of green spaces within urban settings, and trees on public or private lands, as well as institutional or religious spaces amidst the concrete jungle of urban, suburban, and peri-urban areas.

Statement 2 is correct: Developed by Japanese botanist Akira Miyawaki, the Miyawaki method focuses on planting native trees in dense clusters to accelerate forest growth in small urban spaces. By recreating the natural forest ecosystem, the Miyawaki method helps establish biodiverse urban forests that are resilient to environmental stressors and provide various ecological benefits. Given its effectiveness in densely populated areas where space is limited, the Miyawaki method has gained recognition as an innovative approach to urban forestry.

Statement 3 is incorrect: Nagar Van Yojana envisages creating 1000 Nagar Van / Nagar Vatika in Cities having Municipal Corporation/Municipal council/Municipality/Urban Local Bodies (ULBs) for providing wholesome healthy living environment for the residents and thus contributing to growth of clean, green, healthy and sustainable cities (there is no categorization of at least 1 million). The salient features of Nagar Van Yojana are:

- 1) Creating green space and aesthetic environment in an urban set up.
- 2) Creating awareness about plants and biodiversity and developing environmental stewardship.
- 3) Facilitating in-situ conservation of important flora of the region.
- 4) Contributing to environmental improvement of cities by pollution mitigation, providing cleaner air, noise reduction, water harvesting and reduction of heat islands effect.
- 5) Extending health benefits to residents of the city and
- 6) Helping cities become climate resilient.

Source: <https://pib.gov.in/Pressreleaseshare.aspx?PRID=1846954>

<https://sansad.in/getFile/loksabhaquestions/annex/1712/AU2867.pdf?source=pqals>

<https://www.egyankosh.ac.in/bitstream/123456789/83616/1/Unit-5.pdf>

Subject:) Geography Topic:) Forest Subtopic:)

Q.65)

Ans) d

Exp) Option d is the correct answer.

The United Nations recently designated seven initiatives spanning Africa, Latin America, the Mediterranean, and Southeast Asia as the UN World Restoration Flagships. **One of the initiatives is Terai**

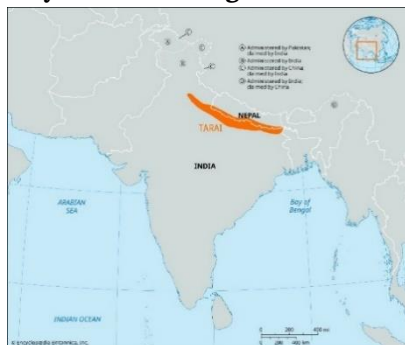
Arc Landscape initiative. It aims to restore critical forest corridors in the India- Nepal region with the help of local communities acting as citizen scientists, anti-poaching units, forest guards, and more.

Statement 1 is correct: The Terai region is a geographical belt in the southern part of Nepal that stretches along the Himalayan foothills. Terai region is a **zone of porous land where rivers deposit fine sand, silt, and clay.** It's made up of river-worked sediments that were deposited within the last 10,000 years.

Statement 2 is correct: The Terai region is known for its **low-lying plains with marshy, swampy areas due to the presence of rivers and springs.**

Statement 3 is correct: Terai comprises the lowland region below the Himalayan foothills and north of the Indo-Gangetic plains covering entire Uttar Pradesh, southern parts of Uttarakhand, and Bihar.

Statement 4 is correct: The community belongs to the Terai lowlands, amid the Shivalik or lower Himalayas. Most of them are forest dwellers, and some practice agriculture. **The word Tharu is believed to be derived from Sthavir, meaning followers of Theravada Buddhism. The Government of Uttar Pradesh has recently launched a scheme which provides tourists from around the world to visit and stay in Tharu villages and homes and can experience their culture closely.**



Source: <https://ncert.nic.in/ncerts/l/kegy102.pdf>

<https://www.thehindu.com/sci-tech/energy-and-environment/terai-tigers-poop-info-on-prey-selection/article67239254.ece>

<https://indianexpress.com/article/explained/explained-who-are-the-tharu-tribals-of-the-up-terai-7095740/>

Subject:) Geography

Topic:) Physical Features

Subtopic:)

Q.66)

Ans) b

Exp) Option b is the correct answer.

A mountain pass is a navigable route through a mountain range or over a ridge, often providing the easiest way to travel across otherwise difficult or impassable terrain.

Pair 1 is correct. Niti Pass is an international high mountain pass at an elevation of 5,086m (16,686ft) on the border between India and China. It **connects Uttarakhand with southern Tibet.** It was an ancient trade route connecting India and Tibet. It has been closed since the 1962 China-Indian War.

Pair 2 is incorrect. The **Sela Pass is a high-altitude mountain pass in Arunachal Pradesh, India,** that connects the Tawang and West Kameng districts. It has an elevation of 4170 meters and connects the Indian Buddhist town of Tawang to Dirang and Guwahati. The pass carries National Highway 13 (previously NH 229), which connects Tawang to the rest of India.

Pair 3 is incorrect. Bhor Ghat is a mountain pass on the crest of the Western Ghats in Maharashtra, India, that connects Palasdari and Khandala by railway and Khopoli and Khandala by road.

Pair 4 is correct. The Kongka Pass, also known as Kongka La, is a low mountain pass in eastern Ladakh that marks the Line of Actual Control between India and China. It is situated on a spur of the Karakoram range that intrudes into the Chang Chenmo Valley, adjacent to the disputed Aksai Chin region.

Pair 5 is correct. Rohtang Pass is a high mountain pass (elevation 3,980 meters) on the eastern end of the Pir Panjal Range of the Himalayas, approximately 51 kilometers from Manali in the Indian state of **Himachal Pradesh**. It connects the Kullu Valley to Himachal Pradesh's Lahaul and Spiti valleys.

Source: <https://ncert.nic.in/textbook/pdf/iess102.pdf>

Subject:) Geography

Topic:) Physical Features

Subtopic:)

Q.67)

Ans) a

Exp) Option a is the correct answer.

The Active Noise Cancellation (ANC) system consists of microphones that "listen" to the sounds outside and inside the earphone, an ANC chipset that inverts the soundwaves, and a speaker inside the earphone that cancels the outside sound with neutralizing soundwaves.

Option a is correct. Noise cancellation earphones/headphones primarily use a technology known as Active Noise Cancellation (ANC). This involves built-in microphones that pick up external sounds. **The earphones/headphones then use this information to generate sound waves that are the exact opposite (out of phase) of these external sounds.** When these opposing sound waves meet, they cancel each other out through destructive interference, effectively reducing the amount of external noise that reaches the listener's ears.

Option b is incorrect. This describes passive noise isolation, not active noise cancellation. While some noise-canceling headphones might also include passive noise isolation through padding, the defining feature of noise-canceling headphones is their active electronic process.

Option c is incorrect. Amplifying internal sounds does not cancel out external noise; it would just make the internal sounds louder. ANC specifically targets and reduces unwanted external noise.

Option d is incorrect. Echo cancellation is a different technology primarily used to remove echo in voice communication systems. It does not actively reduce ambient noise in the way that noise cancellation earphones/headphones do.

Source: <https://indianexpress.com/article/lifestyle/life-style/overusing-noise-cancelling-headphones-risks-9313370/>

<https://timesofindia.indiatimes.com/gadgets-news/explained-all-about-environmental-noise-cancellation-in-headphones-and-earbuds/articleshow/89350037.cms>

Subject:) Science & Tech

Topic:) Emerging Technologies Subtopic:)

Q.68)

Ans) c

Exp) Option c is the correct answer.

Statement 1 is correct: Human papillomavirus (HPV) infection is the primary cause of cervical cancer. HPV is a group of viruses that are **transmitted through sexual contact.**

1) In most people, the immune system clears up the virus, however in some cases, certain high-risk strains of the virus, particularly **HPV types 16 and 18** persist in the body and **could lead to cancer**.

2) **HPV infects the cells lining the cervix**, leading to changes in these cells that can eventually progress to cancer if left untreated.

Statement 2 is correct: Cervical cancer ranks as the second most common cancer among women in India, following breast cancer. It is estimated that every year around **1.25 lakh women are diagnosed with cervical cancer, and nearly 75,000 of them die.**

Also, **India accounts for nearly a quarter of all cervical cancer deaths in the world.** Factors such as lack of awareness, limited access to screening and preventive services, and high prevalence of HPV infection contribute to the high incidence and mortality rates of cervical cancer in India.

Statement 3 is correct: India has taken a significant step in the fight against cervical cancer by **developing its own indigenous HPV vaccine.** The vaccine was named as **Cervavac**, developed by the **Serum Institute of India (SII)**. Cervavac is a **quadrivalent HPV vaccine against HPV types 6,11,16 and 18.**

Source: <https://www.thehindu.com/sci-tech/health/the-importance-of-periodic-testing-for-human-papillomavirus/article67748610.ece>

https://hpvcentre.net/statistics/reports/IND_FS.pdf

<https://www.thehindu.com/news/cities/chennai/cervix-cancer-advanced-stage-of-diagnosis-still-a-cause-for-concern/article67769453.ece>

<https://indianexpress.com/article/health-wellness/indias-cervical-cancer-vaccine-mercks-gardasil-vaccine-new-lancet-study-9019196/>

Subject:) Science & Tech

Topic:) Disease

Subtopic:)

Q.69)

Ans) c

Exp) Option c is the correct answer.

Recently, reports from Hong Kong's Centre for Food Safety (CFS) and the Singapore Food Agency (SFA) revealed the presence of Ethylene Oxide (EtO), a known carcinogen, in several Indian spice products.

Statement a is correct. Ethylene oxide is classified as group 1 carcinogen by various health organizations, including the International Agency for Research on Cancer (IARC). Prolonged exposure to this chemical has been linked to an increased risk of cancer.

Statement b is correct. It is used by the spice industry as a fumigant to reduce microbial contamination, such as *E. coli* and *Salmonella*. It is a colourless, highly flammable and very reactive gas that kills bacteria, viruses and fungi. It is an industrial chemical.

Statement c is incorrect. Ethylene oxide is a **flammable, colorless gas with a slightly sweet odor.** It is highly reactive and easily ignited, necessitating careful handling.

Statement d is correct. Ethylene oxide is used mainly as a chemical intermediate in the manufacture of ethylene glycol (antifreeze). **Ethylene glycol**, a derivative of ethylene oxide, is the chemical commonly used in antifreeze and engine coolants. Ethylene glycol has properties suitable for such applications, but ethylene oxide does not. **Ethylene glycol is used as an antifreeze and engine coolant because it lowers the freezing point of water while increasing its boiling point.** This keeps water in a radiator from freezing, boiling, or evaporating, which could cause it to burst. Ethylene glycol is also miscible with water in all proportions, due to its ability to form hydrogen bonds.

Source: <https://indianexpress.com/article/lifestyle/food-wine/ethylene-oxide-mdh-everest-indian-food-spices-cancer-risk-health-9289998/>

<https://www.thehindu.com/sci-tech/health/why-are-indian-spices-facing-the-heat-explained/article68133297.ece#:~:text=The%20complaints%20cite%20the%20presence,the%20root%20cause%20of%20contamination.>

<https://timesofindia.indiatimes.com/life-style/health-fitness/health-news/india-made-cough-syrups-contained-toxins-linked-to-141-childrens-deaths/articleshow/104205536.cms>

Subject:) Science & Tech

Topic:) Disease

Subtopic:)

Q.70)

Ans) a

Exp) Option a is the correct answer.

1) When the central fire within the igloo consistently provides heat to the surrounding ice, concurrently the ice tends to lose heat to the colder external air. **Because ice has poor heat conductivity**, it doesn't readily absorb the heat from the fire as efficiently as other materials might.

2) **As long as the rate of heat loss from the ice to the outside is greater than the rate at which the fire delivers heat to it, the ice remains at a stable temperature and does not melt.** This equilibrium allows for the possibility of maintaining the air inside the igloo at a temperature higher than freezing (32°F or 0°C) while ensuring the ice remains colder and remains frozen.

Source: <https://howeverythingworks.org/1997/01/10/question-730/>

Subject:) Science & Tech

Topic:) General Science

Subtopic:)

Q.71)

Ans) a

Exp) Option a is the correct answer.

The GST council decides the **GST rates** in India. The GST Council consists of the Union Finance Minister and representatives from all States and Union Territories. It was established to make decisions on various aspects of GST, including tax rates, exemptions, and administrative procedures.

Option 1 is incorrect. The 50th meeting of GST council held in July 2023 decided to reduce the rate on **uncooked/unfried snack pellets**, by whatever name called, to **5% (not zero percent)**.

Option 2 is correct. GST Council in its 50th meeting has decided to exempt GST of satellite launch services by private operators. It has been decided that GST exemption on satellite launch services supplied by ISRO, Antrix Corporation Limited and New Space India Limited (NSIL) will be extended to such services supplied by organizations in the private sector also to encourage start-ups.

Option 3 is incorrect. The 49th meeting of GST council held in February 2023 decided to reduce GST on **pencil sharpener** from 18% to 12%.

Option 4 is correct. **Fresh milk and pasteurized milk are fully exempt from GST.** Further, milk products like curd, lassi, butter milk and paneer are also exempt from GST if sold in forms other than those pre-packaged and labelled.

Option 5 is incorrect. **Eggs without shell fall in the 5% GST slab.** It is not exempt from GST.

Option 6 is correct: GST Council in its 52nd meeting has decided that nil rate (zero percent) for food preparation of millet flour in powder form and containing at least 70% millets by weight when sold in loose form, and 5% if sold in pre-packaged and labelled form.

Source: <https://www.thehindubusinessline.com/economy/indian-space-start-ups-welcome-gst-exemption-on-satellite-launches/article67083394.ece>

[https://gstcouncil.gov.in/sites/default/files/SGST-](https://gstcouncil.gov.in/sites/default/files/SGST-Circulars/recommendations%20of%2049%20meeting.pdf)

[Circulars/recommendations%20of%2049%20meeting.pdf](https://gstcouncil.gov.in/sites/default/files/SGST-Circulars/recommendations%20of%2049%20meeting.pdf)

<https://pib.gov.in/PressReleasePage.aspx?PRID=1965431>

<https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1938812>

<https://sansad.in/getFile/annex/260/AU1432.pdf?source=pqars#:~:text=A%20concessional%20GST%20of%205,rates%20apply%20uniformly%20across%20states.>

Subject:) Economy

Topic:) GST

Subtopic:)

Q.72)

Ans) c

Exp) Option c is the correct answer.

Food inflation refers to sustained increase in food prices over time, making it harder for people to afford basic necessities.

Statement 1 is correct. Unpredictable weather events like droughts, floods, and unseasonal rains significantly affect crop yields. When agricultural production is lower than expected, the supply of food decreases, leading to higher prices.

Statement 2 is correct. When the **prices of seeds, fertilizers, pesticides, labor, energy costs and other farming necessities go up, the overall cost of production increases.** Farmers often pass these increased costs onto consumers, leading to higher food prices.

Statement 3 is correct. The Cobweb Phenomenon is an economic theory that describes how producers' production and supply decisions are based on current or past prices. An example of this well pronounced cyclical phenomenon has been witnessed in the case of tomatoes, with almost the same situation arising every alternate year. In 2021, tomato had negative inflation with tomato wholesale prices touching as low as ₹2-3 per kg. The steep decline in tomato prices resulted in huge losses for the small and marginal farmers such that many of them could not afford to cultivate the crop in the following months. Due to low price realization, farmers planted lesser area under tomatoes in 2022 and shifted towards crops like soya, cotton and corn. As tomatoes are a short duration crop, the impact of supply shortages transferred to prices (causing Inflation in prices of Tomatoes) in the next 2-3 months.

Source: <https://www.thehindu.com/business/Economy/retail-inflation-accelerates-to-four-month-high-of-57/article67734406.ece>

https://www.nabard.org/auth/writereaddata/tender/pub_270623091211322.pdf

[https://www.thehindu.com/opinion/op-ed/what-is-cobweb-cycle-in-](https://www.thehindu.com/opinion/op-ed/what-is-cobweb-cycle-in-economics/article22744641.ece#:~:text=This%20refers%20to%20a%20phenomenon,due%20to%20faulty%20producer%20expectations.)

[economics/article22744641.ece#:~:text=This%20refers%20to%20a%20phenomenon,due%20to%20faulty%20producer%20expectations.](https://www.thehindu.com/opinion/op-ed/what-is-cobweb-cycle-in-economics/article22744641.ece#:~:text=This%20refers%20to%20a%20phenomenon,due%20to%20faulty%20producer%20expectations.)

<https://indianexpress.com/article/explained/explained-law/icj-israel-military-assault-rafah-9359950/>

<https://www.thehindu.com/business/Economy/inflation-drops-to-10-month-low-in-march-2024-but-no-relief-on-food-bills-yet/article68058591.ece>

<https://www.reuters.com/world/india/indias-retail-inflation-eases-483-2024-05-13/>

<https://www.bbc.com/news/world-asia-india-66655642>

Subject:) Economy

Topic:) Inflation

Subtopic:)

Q.73)

Ans) b

Exp) Option b is the correct answer.

Net National Product (NNP) at factor cost is considered as National Income as it represents the total income generated by an economy's factors of production, such as labour and capital. It excludes the effects of indirect taxes and subsidies and offers a clear assessment of the actual earnings of an economy's resources, reflecting the income available to its citizens.

NNP at factor cost or National Income is calculated as under:

NNP or National Income (NI)

NNP = GDP + Income from Abroad – Depreciation

or

NNP = GNP – Depreciation.

Source: NCERTs for Economics Class 12th - Introductory Macroeconomics – Chapter – National Income Accounting

Subject:) Economy

Topic:) National Income

Subtopic:)

Q.74)

Ans) b

Exp) Option b is the correct answer.

Current account deficit refers to the situation where a country's total imports of goods, services, and transfers exceed its total exports and transfers out.

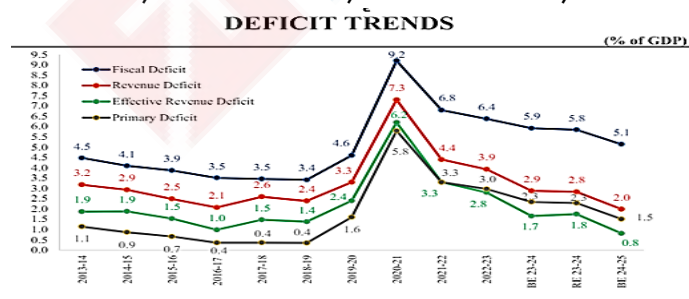
Fiscal deficit is the difference between the government's total expenditure and its total receipts excluding borrowing.

Primary Deficit indicates the borrowing requirements of the government, excluding interest. It is the difference between fiscal deficit and interest payments.

Statement 1 is correct. For 2022-23 as a whole, India's **current account deficit** stood at 2.0 percent of GDP which was 1.2 per cent in 2021-22. In 2020-21 it was a surplus of 0.9 percent of GDP. So, India's Current Account Deficit (CAD) has been steadily increasing in last three financial years from surplus of 0.9 % of GDP in 2020-21 to deficit of 2% of GDP in 2022-23.

Statement 2 is correct. India's **Fiscal deficit** has been **steadily declining since the last 3 years**. It was at the highest in recent years in 2020/21 at 9.2% which declined to 6.8 and 6.4 in subsequent years i.e. in 2021-22 and 2022-23 respectively.

Statement 3 is incorrect. The **primary deficit** is showing a **declining trend** in the last three years from 5.8 in 2020/21 to 3.3 in 2021/22 to 3% in 2022/23.



Source: <https://www.thehindu.com/business/Economy/govts-fiscal-deficit-rises-to-393-of-annual-target-in-first-half-of-fy24/article67480542.ece>

<https://www.thehindu.com/business/budget/explained-is-the-government-on-track-on-fiscal-deficit-targets/article66472080.ece>

https://www.deccanherald.com/business/india-s-current-account-deficit-widens-to-67-billion-in-2022-23-1231696.html#google_vignette

<https://indianexpress.com/article/explained/explained-economics/current-account-deficit>

Subject:) Economy

Topic:) Deficit trends

Subtopic:)

Q.75)

Ans) a

Exp) Option a is the correct answer.

Statement I is correct: India's net household savings have **experienced a significant decline in recent years**. According to data from the Reserve Bank of India, **household net savings stood at a 47-year low in the financial year 2023, shrinking to 5.3% of the GDP, down from 7.3% in 2022**.

Statement II is correct and correctly explains statement I: The share of household borrowing in household (disposable) income registered a sharp spike in 2022-23. This indicates a rise in household liabilities associated with a decline in the physical to financial savings ratio. Thus, the decline of household savings is attributed primarily to a **rise in household financial liabilities (loans)**.

Figure 2: The household borrowing-income ratio, debt-income ratio and the ratio between household physical savings and gross financial savings



Source: [https://www.thehindu.com/business/Economy/on-the-fall-in-household-savings/article68092017.ece#:~:text=While%20the%20gross%20financial%20savings,%25\)%20during%20the%20same%20period.](https://www.thehindu.com/business/Economy/on-the-fall-in-household-savings/article68092017.ece#:~:text=While%20the%20gross%20financial%20savings,%25)%20during%20the%20same%20period.)

https://www.business-standard.com/finance/personal-finance/explained-household-savings-at-5-year-low-mf-investments-see-boom-124050800630_1.html#:~:text=Reason%3A%20Economists%20attribute%20this%20decline,crore%20in%20the%20previous%20year.

<https://economictimes.indiatimes.com/news/economy/indicators/household-savings-declined-due-to-rising-home-auto-personal-loans/articleshow/109979621.cms?from=mdr>

Subject:) Economy Topic:) Savings Subtopic:)

Q.76)

Ans) d

Exp) Option d is the correct answer.

Statement I is incorrect: The Supreme Court in **Deepak Kumar etc. v/s State of Haryana & Ors.** has ordered that **environmental clearances are needed even if sand mining operations are conducted in less than 5 hectares of area**. The Sustainable Sand Mining Management Guidelines of 2016 provide that

for such areas, environmental clearances shall be granted by the **District Environment Impact Assessment Authority** headed by the District Collector / District Magistrate.

Statement II is correct: Sand is a minor mineral under Section 3(e) of the Mines and Minerals (Development & Regulation) Act, 1957 (MMDR Act).

Sand mining in India is subject to regulation under the **Mines and Minerals (Development and Regulation) Act, 1957 (MMDR Act)** and the **Mineral Concession Rules framed by the respective State Governments or Union Territories (UT) Administrations** under section 15 of the MMDR Act. Additionally, Section 23C of the MMDR Act grants authority to the **State Governments or UT Administrations to formulate regulations** aimed at preventing illegal mining, transportation, and storage of minerals, as well as to enforce provisions related to sustainable sand mining guidelines. **The Ministry of Environment Forest and Climate Change (MoEF&CC) has also issued Enforcement & Monitoring Guidelines for Sand Mining.** These guidelines, supplementary to the **Sustainable Sand Management Guidelines of 2016**, serve to regulate sand mining activities across the country.

Source:

[https://sansad.in/getFile/loksabhaquestions/annex/1710/AU890.pdf?source=pqals#:~:text=\(a\)%20to%20\(d\),section%2015%20of%20this%20Act](https://sansad.in/getFile/loksabhaquestions/annex/1710/AU890.pdf?source=pqals#:~:text=(a)%20to%20(d),section%2015%20of%20this%20Act).

<https://pib.gov.in/newsite/PrintRelease.aspx?relid=155423>

<https://environmentclearance.nic.in/writereaddata/SandMiningManagementGuidelines2016.pdf>

<https://pib.gov.in/PressReleseDetailm.aspx?PRID=1906449>

Subject:) Environment

Topic:) Environmental Issues

Subtopic:)

Q.77)

Ans) a

Exp) Option a is the correct answer.

Statement 1 is correct: According to **Article 299 of Indian Constitution**, all the contracts made in the exercise of the executive power of the Union shall be expressed to be **made by the President of India**. Further, the President or the Governor of a state is not personally liable in respect of any contract executed in his/her name.

Statement 2 is incorrect: While Article 303(1) of the Indian Constitution prohibits Parliament from making laws that favor one state over another in matters of trade and commerce, Article 303(2) provides an exception allowing Parliament to make such laws if **necessary to deal with situations arising from a scarcity of goods. It nowhere mentions that the prior consent of President is needed.**

Statement 3 is incorrect: According to Article 304(b) of the Indian Constitution, **state legislatures can impose reasonable restrictions on trade, commerce, or intercourse** within the state in the public interest with the **prior sanction of the President of India (not Governor of the state).**

Source: Laxmikanth

<https://cdnbbsr.s3waas.gov.in/s380537a945c7aaa788ccfcd1b99b5d8f/uploads/2023/05/2023050195.pdf>

Subject:) Polity

Topic:) Constitutional provisions

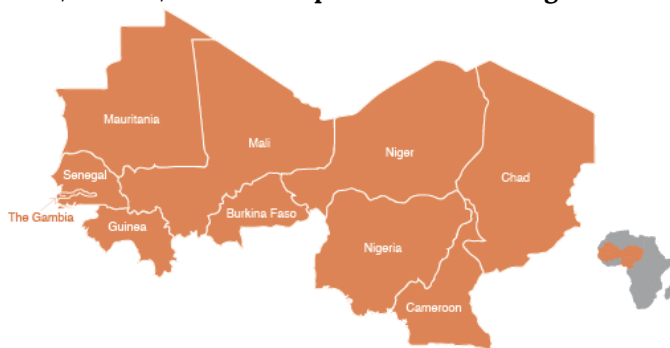
Subtopic:)

Q.78)

Ans) a

Exp) Option a is the correct answer.

The Sahel is a **semi-arid region in Africa** that stretches from the Atlantic coast to the Red Sea coast. It's a 3,860-kilometer arc-like land mass that's a cultural and historical transition between the Middle East and sub-Saharan Africa. The Sahel is made up of the following countries: **Burkina Faso, Chad, Mali, Mauritania, and Niger**, also known as the G5 Sahel, **Cameroon, The Gambia, Guinea, Nigeria, Senegal, Sudan, Eritrea, and a small part of southern Algeria**



Sahel is one of the world's **most youthful regions with 64.5% of the population being below 25 years**. United Nations has come up with a unique support plan UN Support Plan for the Sahel targeting 10 countries to scale up efforts to accelerate prosperity and sustainable peace in the region.

Target countries:

Burkina Faso, Cameroon, Chad, The Gambia, Guinea Mauritania, Mali, Niger, Nigeria and Senegal.

Source: <https://www.thehindu.com/news/international/burkina-faso-mali-and-niger-finalise-regional-alliance-project/article68191439.ece>

<https://www.un.org/africarenewal/sahel>

Subject:) International Relations

Topic:) Region in News

Subtopic:)

Q.79)

Ans) b

Exp) Option b is the correct answer.

Statement 1 is incorrect: The GEAC was established under the "**Rules for the Manufacture, Use/Import/Export and Storage of Hazardous Microorganisms/Genetically Engineered Organisms or Cells (Rules, 1989)**" framed under the **Environment (Protection) Act, 1986**, not the Biological Diversity Act of 2002.

Statement 2 is correct: The GEAC is responsible for appraising **activities involving the large-scale use of hazardous microorganisms** and recombinants in research and industrial production from the environmental angle.

Source: <http://www.geacindia.gov.in/functions.aspx>

<http://www.geacindia.gov.in/about-geac-india.aspx>

<https://www.thehindu.com/news/national/expained-genetically-modified-crops-and-their-regulation-in-india/article66071153.ece>

Subject:) Environment

Topic:) Biodiversity Subtopic:)

Q.80)

Ans) b

Exp) Option b is the correct answer.

Option 1 is correct: According to article 317(1) of Constitution of India, the Chairman or any other member of a Public Service Commission shall only be removed from his office by order of the President on the ground of misbehaviour after the Supreme Court, on reference being made to it by the President, has, on inquiry held in accordance with the procedure prescribed in that behalf under article 145, reported that the Chairman or such other member, as the case may be, ought on any such ground to be removed. **Therefore, Supreme Court plays a role in the removal process of the Chairman of Union Public Service Commission.**

Option 2 is correct: As per **National Commission for Scheduled Castes and Scheduled Tribes Chairperson and Members (Conditions of Service and Tenure) Rules, 1990**, the President can remove the chairman or any member of the National Commission for Scheduled Tribes if they are adjudged insolvent, engage in paid employment outside their duties, or are unfit due to mental or physical infirmity. **The Chairperson shall only be removed from his office by order of the President on the ground of misbehavior after the Supreme Court, on reference being made to it by the President, has on inquiry held in accordance with the procedure prescribed by it under sub-clause(i) of clause(1) of article 145 of the Constitution, reported that the Chairperson ought on any such ground to be removed. Therefore, Supreme Court plays a role in the removal process of the Chairman of National Commission for Scheduled Tribes.**

Option 3 is incorrect: According to **article 324 of Constitution of India**, the Chief Election Commissioner can be **removed from office in a manner similar to that of a Supreme Court judge**, which requires a resolution passed by both Houses of Parliament on grounds of proved misbehavior or incapacity. **The Supreme Court does not play a role in the removal process.**

Option 4 is correct: The President can remove the Central Vigilance Commissioner or any Vigilance Commissioner for various reasons, including insolvency, conviction for an offense involving moral turpitude, engagement in outside employment, mental or physical incapacity, or acquiring interests likely to affect official functions. **Additionally, the Central Vigilance Commissioner or any Vigilance Commissioner shall be removed from his office only by order of the President on the ground of proved misbehaviour or incapacity after the Supreme Court, on a reference made to it by the President, has, on inquiry, reported that the Central Vigilance Commissioner or any Vigilance Commissioner.**

Option 5 is incorrect: According to **Article 148 of Constitution of India**, the Comptroller and Auditor General of India (CAG) can be removed from office by the President only on the same grounds and in the same manner as a Supreme Court Judge. This means that the President can remove the **CAG only if both houses of Parliament pass a resolution with a special majority**, stating that the CAG has proved misbehavior or incapacity. **Therefore, the Supreme Court does not play a role in the removal process.**

Source: Laxmikanth

<https://ncst.nic.in/content/ncst-cp-vicecp-and-members-conditions-service-and-tenurerules-2004>

<https://cvc.gov.in/files/cvcact-pdf/CA%2000001.pdf>

Subject:) Polity

Topic:) Constitutional Bodies

Subtopic:)

Q.81)

Ans) b

Exp) Option b is the correct answer.

The revolt of 1857 started on 10th May when the Company's Indian soldiers at Meerut rebelled. Called the Sepoy Mutiny by the British. The movement spread across various parts of India. The British sent an army under the leadership of various officers to suppress the revolt of 1857. On the 8th July 1858, the then Governor-general, Lord Canning, proclaimed the end of the Mutiny.

Following are some of the British officials associated with the suppression of the 1857 revolt in various regions.

Option b is correct:

1) The British army under **John Nicholson**, captured Delhi on September 20, 1857 after prolonged and bitter fighting.

2) The Jhansi was recaptured by British commander-in-chief **Sir Hugh Rose**.

3) Henry Lawrence involved in suppressing the revolt of 1857 in Lucknow.

4) William Taylor and Eyre Suppressed the revolt at Arrah in August 1857.

Source: <https://nios.ac.in/media/documents/secsocscicour/english/lesson-07.pdf>

A Brief History of Modern India by Rajiv Ahir.

Subject:) Modern History

Topic:) Revolt of 1857

Subtopic:)

Q.82)

Ans) a

Exp) Option a is the correct answer.

Pair 1 is incorrect: Darasuram:

1) Darasuram is a small town located in **Thanjavur district in the state of Tamil Nadu**.

2) Although Darasuram is notable for its temple architecture, it is **not specifically known for a sun temple**.

3) The prominent feature of **Darasuram is the Airavatesvara Temple, dedicated to Lord Shiva**.

4) The **Airavatesvara Temple is a UNESCO World Heritage Site** and is one of the three ancient temples that are collectively called the "**Great Living Chola temples**". The other two temples being; **Brihadeshwara temple (Thanjavur) and Gangaikondacholeeswaram temple (Gangaikonda Cholapuram)**.

1) It was built by the Chola dynasty during **the 12th century CE under the reign of Rajaraja Chola II**.

2) The temple is famous for its **sacred temple tank and musical steps**.

Pair 2 is incorrect: Arsavalli:

1) Arsavalli is a village located in the **Srikakulam district of Andhra Pradesh**.

2) The significant attraction of Arsavalli is the **Sri Suryanarayana Swamy Sun Temple, dedicated to the Sun God, Surya**.

3) The Sun Temple at Arsavalli is one of the ancient sun temples in India, dating back to the **7th century AD**, and was **built by the Eastern Ganga dynasty**.

4) It is one of the two temples of its kind, the other being the **Konark Sun temple of Odisha**.

5) The temple was constructed in such a way that the **early morning rays of the sun fall on the feet of the deity in the inner sanctum sanctorum, twice a year** (February and June)

Pair 3 is correct: Pattadakal:

1) Pattadakal, is a **UNESCO World Heritage Site located on the banks of Malprabha river, in the Bagalkot district of Karnataka**.

2) It served as the coronation site for several **Chalukyan kings** and is renowned for its group of monuments built during the **7th and 8th centuries CE**.

3) The Virupaksha Temple is the most prominent temple at Pattadakal, dedicated to Lord Shiva, and was **built by Queen Loka Mahadevi of Chalukyan dynasty in 740 CE.**, to commemorate her husband's (**King Vikramaditya II**) victory.

4) The temple is dedicated to **Lord Shiva** stands as a masterpiece of Chalukyan architecture, characterized by its **Dravidian style**, intricately carved pillars, and elaborate sculptures.

5) The other temples located at Pattadakal includes; **Mallikarjuna temple, Sangameswara temple, Galaganatha temple, Kashi Visweshwara temple and Papanath temple.**

Source: <https://ncert.nic.in/ncerts/l/kefa106.pdf>

<https://www.thehindu.com/news/national/andhra-pradesh/thousands-of-devotees-visit-arasavilli-sun-temple-in-andhra-pradesh-on-the-occasion-of-ratha-saptami/article66442526.ece>

<https://www.thehindu.com/news/cities/Tiruchirapalli/renovation-of-drainage-system-near-darasuram-temple-under-way/article67412121.ece>

Subject:) Art and Culture

Topic:) Architecture

Subtopic:)

Q.83)

Ans) b

Exp) Option b is the correct answer.

Statement I is correct: James Mill, in his work "The History of British India" (published in 1817), **divided Indian history into three periods:** the **Hindu Period**, the **Muslim Period**, and the **British Period**. This tripartite division categorized the history of the Indian subcontinent based on the dominant ruling powers.

Statement II is correct: According to James Mill, the period preceding British rule, which included both the Hindu and Muslim periods, was characterized by darkness, despotism, and social backwardness. Mill viewed the rulers of these periods as despots and believed that religious intolerance, caste taboos, and superstitious practices dominated social life.

He felt that British rule was necessary to civilize India by introducing European manners, arts, institutions, and laws. Mill even suggested that the British should conquer all territories in India to ensure the enlightenment and happiness of the Indian people, as he believed India was not capable of progress without British help.

But Statement II is not the correct explanation for Statement I because Mill believed that India under the rule of Hindu's and Muslim's was stuck with the religion. **Religion was the driving force in the rule of Hindus and Muslims.** He characterizes a historical period only through the religion of the rulers of the time to show that it was a religiously intolerant society.

Further he tried to distinguish the British rule by identifying it as the rule which is not based on the religion of the rulers (Christianity of Britishers) and British were in India for the development and wellbeing of all Indians without concerning to their religions. Hence, he argued British rule was necessary to civilize India by introducing European values and institutions.

Source: <https://ncert.nic.in/textbook/pdf/hess201.pdf>

<https://www.thehindu.com/opinion/op-ed/going-backwards-on-indian-history/article62106450.ece>

Subject:) Modern History

Topic:) Personalities

Subtopic:)

Q.84)

Ans) d

Exp) Option d is the correct answer.

Statement I is incorrect: Hybrid vehicles offer improved fuel efficiency compared to traditional vehicles. However, **the running cost (fuel cost per kilometer) of Hybrid Vehicles (HVs) is higher than that of equivalent Electric Vehicles (EVs).**

Electric vehicles rely solely on electricity for propulsion, which generally costs less per kilometre than gasoline or diesel fuel. Moreover, electric vehicles typically have fewer moving parts and require less maintenance compared to hybrid vehicles, translating to long-term cost savings. While hybrid vehicles may have certain advantages in specific driving scenarios, such as long-distance trips where access to charging infrastructure is limited, electric vehicles generally offer lower running costs over the vehicle's lifetime.

Statement II is correct: Hybrid Vehicles are equipped with both an onboard electricity generation system and an internal combustion engine. Hybrid vehicles indeed represent a technological bridge between traditional internal combustion engine vehicles and fully electric vehicles.

These vehicles **incorporate both an internal combustion engine, usually running on gasoline or diesel, and an onboard electricity storage system, typically comprising a battery pack and electric motor.** This dual-power system enables hybrid vehicles to operate in various modes, including electric-only mode, hybrid mode, and regenerative braking.

Hence the correct answer is option d, Statement-I is incorrect but Statement-II is correct.

Source: <https://afdc.energy.gov/vehicles/electric-maintenance>

<https://afdc.energy.gov/vehicles/how-do-hybrid-electric-cars-work>

<https://auto.economictimes.indiatimes.com/news/passenger-vehicle/are-hybrid-vehicles-better-than-electric-vehicles/104908025>

<https://www.livemint.com/money/can-hybrid-cars-help-you-save-more-than-the-evs-11701769823326.html>

Subject:) General Knowledge

Topic:) Technology in News

Subtopic:)

Q.85)

Ans) b

Exp) Option b is the correct answer.

Statement I is correct: The Indian Constitution in its Preamble explicitly states that India is a "Secular State." The Preamble of the Indian Constitution describes India as a **"sovereign socialist secular democratic republic."** Thus, **it declares the nature of the Indian State as secular.** The term "secular" was added to the Preamble of the Indian Constitution by the **42nd Constitutional Amendment Act, 1976.** It implies that the state has no official religion and treats all religions impartially.

Statement II is correct: Article 25 of the Indian Constitution guarantees to all the persons the freedom of conscience and the right to freely profess, practice, and propagate religion. However, this right is **subject to public order, morality, and health**, which means that the state can impose restrictions on these freedoms to maintain public order, morality, and health

However, **Statement II is not the correct explanation for Statement I:**

Statement I pertain to the **broader principle of secularism in India**, which also includes that the state treats all religions equally and does not endorse or favour any religion.

Statement II, on the other hand, specifically addresses individual rights related to religious freedom. While these individual rights are an aspect of India's secular nature, they do not by themselves explain the entire concept of secularism of India. The concept of secularism involves various elements, including the state's neutrality towards all religions and the prohibition of religious discrimination, beyond just the individual rights outlined in Article 25.

Therefore, while both statements are correct and related to the secular nature of the Indian state, Statement II does not fully explain the constitutional declaration of secularism in Statement I.

Hence, **Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I.**

Source: Indian Polity, M. Laxmikanth

Subject:) Polity

Topic:) Constitution of India

Subtopic:)

Q.86)

Ans) c

Exp) Option c is the correct answer.

Statement 1 is correct: The payments banks are registered as a public limited company under the Companies Act, 2013, and licensed under Section 22 of the Banking Regulation Act, 1949, with specific licensing conditions restricting its activities mainly to acceptance of demand deposits and provision of payments and remittance services.

Statement 2 is correct: Scope of activities of Payments banks include acceptance of demand deposits, i.e., current deposits, and savings bank deposits from individuals, small businesses and other entities, as permitted. Although, **no NRI deposits are allowed to be accepted by these banks.**

Statement 3 is correct: Payments Banks shall maintain a minimum investment to the extent of not less than 75 per cent of 'demand deposit balances' in Government securities/Treasury Bills that are recognized by RBI as eligible securities for maintenance of Statutory Liquidity Ratio (SLR).

Statement 4 is incorrect: Deposit insurance provided by DICGC covers all commercial banks, including Payment Banks, Small Finance Banks, Regional Rural Banks, Foreign Bank branches in India, Local Area Banks and Co-operative Banks in all States and Union Territories. Under the Deposit Insurance and Credit Guarantee Corporation (DICGC) Act, 1961, the Corporation is liable to pay the insured deposit amount to depositors of an insured bank. Such liability may arise when an insured bank undergoes: (i) liquidation (sale of all assets on closing down of the bank) (ii) reconstruction or any other arrangement under a scheme, or (iii) merger or acquisition by another bank.

Source: https://www.rbi.org.in/scripts/bs_viewcontent.aspx?Id=2900

<https://www.indiabudget.gov.in/budget2022-23/economicsurvey/doc/echapter.pdf> (page 157)

https://www.dicgc.org.in/pdf/2023/PublicAwarenessMaterial/DICGC_Flyer.pdf

Subject:) Economy

Topic:) Banking

Subtopic:)

Q.87)

Ans) d

Exp) Option d is the correct answer.

The tribal groups of “Shompen”, “Jarawas”, and “onges” are found in the Union Territory of Andaman and Nicobar Islands. The Andaman and Nicobar Islands are home to six main aboriginal tribes: Andamanese, Onge, Jarawa, Sentinelese, Nicobarese, Shompen.

The Andamanese, Onge, Jarawa, Jangil, and Sentinelese are classified by anthropologists as Negrito peoples. The Nicobarese are of Mongoloid origin. The tribes have preserved their indigenous cultures due to their relative isolation.

Other Tribes and their place of location is as follows:

- 1) Gaddi – Himanchal Pradesh
- 2) Bhotia – Uttarakhand
- 3) Apatani, Singpho, Nyishi – Arunachal Pradesh.

Source: <https://northmiddle.andaman.nic.in/people-cultures/#:~:text=The%20main%20ethnic%20groups%20are,of%20Andaman%20and%20Nicobar%20culture>.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1774260#:~:text=As%20part%20of%20the%20nationwide%20celebration%2C%20the,iconic%20week%20of%20Azadi%20Ka%20Amrit%20Mahotsav.&text=The%20Andaman%20and%20Nicobar%20Administration%20with%20support,Andamanese%2C%20Onges%2C%20Jarawas%2C%20Sentinelese%2C%20Nicobarese%20and%20Shompens>.

Subject:) Social Issues

Topic:) Tribes

Subtopic:)

Q.88)

Ans) a

Exp) Option a is the correct answer.

Statement I is correct: Histoplasmosis is a fungal infection caused by the fungus *Histoplasma capsulatum*. This infection **primarily affects the lungs** and can produce symptoms similar to those of respiratory infections like pneumonia. **Thus, it can cause severe respiratory illness in humans.**

Statement II is correct and is the correct explanation of Statement I: Histoplasmosis is typically contracted by inhaling spores of *Histoplasma capsulatum*, which are found in environments contaminated with bird (such as pigeons) or bat droppings. The breathable antigen arising from the bird (pigeons) droppings and feathers goes into the lung and leads to an immunological reaction, which damages the lung and causes severe respiratory illness.

Source: <https://indianexpress.com/article/cities/mumbai/thane-municipal-authorities-advise-residents-to-not-feed-pigeons-8480585/>

<https://timesofindia.indiatimes.com/life-style/health-fitness/health-news/pigeon-droppings-can-lead-to-severe-lung-issues-heres-how/photostory/106593119.cms?picid=106593148>

Subject:) Science & Tech

Topic:) Disease

Subtopic:)

Q.89)

Ans) a

Exp) Option a is the correct answer.

The Investment Facilitation for Development (IFD) agreement was launched in 2017 by a group of **developing and least-developed WTO members**. Recently, the WTO members finalized the IFD Agreement in November 2023.

Statement 1 is correct: IFA agreement is a plurilateral agreement that is open for all WTO members to join. **It is a legally binding treaty that aims to make it easier for developing and least-developed countries to attract and retain foreign direct investment (FDI).** The IFD agreement aims to create a more investor-friendly environment by streamlining investment procedures and enhancing transparency and predictability for FDI. The IFD agreement also aims to strengthen investment climates to foster economic growth and sustainable development

Statement 2 is incorrect: The IFD agreement does not provides for a separate Investor-State Dispute Settlement (ISDS) mechanism outside WTO to protect the interests of investors.

Article 44 of IFD agreement states that Parties to the **IFDA can use the WTO's dispute settlement mechanism for any dispute that may arise.** However, the Parties are not allowed to use the mechanism to bring a claim against another Party for failing to comply with the articles in the sustainable investment section. The article also encourages Parties to use alternative dispute resolution solutions provided under the Dispute Settlement Understanding, including good offices, conciliation, and mediation, rather than raising a formal dispute claim as a first solution.

Statement 3 is incorrect: India has decided not to participate in the IFD agreement because it maintains the position that **investment and trade are two distinct aspects.** Additionally, India refers to the 2015 WTO Nairobi ministerial decision, which states that any decision to start negotiations on new issues must be agreed upon by all members. Since not all countries agreed to negotiate on the IFD Agreement, India considers the IFD negotiations and the resulting text to be illegal.

Knowledge Base: The key areas included in the IFD Agreement to promote and facilitate investment are Transparency and predictability of investment measures, Streamlining and speeding up administrative procedures, special and different treatment for developing and least-developed countries, Sustainable investment practices like responsible business conduct; measures against corruption etc

Source:

https://www.wto.org/english/tratop_e/invfac_public_e/invfac_e.htm#:~:text=easier%20for%20investors-,in,-all%20sectors%20of

<https://www.thehindu.com/opinion/op-ed/wtos-investment-facilitation-negotiations-are-not-illegal/article67999080.ece>

<https://intracen.org/file/ifflyer18jan24enfinalpdf> (Pg no 1)

Subject:) Economy

Topic:) External Agreement

Subtopic:)

Q.90)

Ans) d

Exp) Option d is the correct answer.

The United Nations Human Rights Council (UNHRC) is made of 47 Member States, which are elected by the majority of members of the United Nations General Assembly (UNGA) through direct and secret ballot. Members of the Council serve for a period of **three years and are not eligible for immediate re-election** after serving two consecutive terms.

Statement 1 is incorrect: The United Nations Human Rights Council (UNHRC) **is the intergovernmental body within the United Nations** responsible for human rights. It was **established in 2006 (not 1948) by the United Nations General Assembly (UNGA)** and it is responsible for strengthening the promotion and protection of human rights around the globe.

Statement 2 is incorrect: The UNHRC receives secretariat support from the Office of the High Commissioner for Human Rights (OHCHR). The OHCHR is part of the UN Secretariat and supports the High Commissioner in the implementation of his/her mandate.

At the **International Conference held in Tunis in 1993**, National Human Rights Institutions (NHRIs) established the International Coordinating Committee of NHRIs (ICC) with the aim to **coordinate the activities of the NHRI network**. In 2016, the ICC changed its name into the **Global Alliance of National Human Rights Institutions (GANHRI)**.

Statement 3 is incorrect: The UNHRC is composed of 47 Member States (not all the members of United Nations) and provides a multilateral forum to address human rights violations. **India, Pakistan, China, USA are some of its members, while Russia and North Korea are not the members of UNHRC.** Recently, **Russia was expelled** from the top human rights body after its forces invaded Ukraine.

Statement 4 is incorrect: Recently, the UNHRC adopted a resolution calling for Israel to be held accountable for possible war crimes and crimes against humanity in the Gaza Strip. The resolution presented by Pakistan on behalf of the Organisation of Islamic Cooperation (OIC) and **India had abstained from voting on this resolution.**

Source: <https://www.ohchr.org/en/hr-bodies/hrc/membership#:~:text=Bangladesh%2C%20China%2C%20Fiji%2C-,India,-%2C%20Indonesia%2C%20Iraq%2C%20Japan>

<https://www.hindustantimes.com/india-news/india-abstains-as-un-body-votes-on-israel-war-crimes-101712342091105.html>

<https://www.bbc.com/news/world-europe-67071697#:~:text=from%20the%20top-,human,-rights%20body%20last>

Subject: International Relations

Topic: International treaties/Pacts

Subtopic:)

Q.91)

Ans) b

Exp) Option b is the correct answer.

Statement 1 is correct: Personality rights, also known as the right to persona, refer to the rights of individuals to control and profit from their own image, signature, name, voice and other aspects of their identity. These rights are often **intertwined with the right to privacy and the right to property.**

1) The right to privacy protects individuals from unwanted intrusion into their personal lives and the unauthorized use of their personal information. Personality rights extend this protection to aspects of an individual's identity that are commercially valuable or inherently personal.

2) Additionally, personality rights can be viewed as a form of property rights, where individuals have the exclusive right to exploit their own persona for commercial gain, such as through endorsements, merchandising, or licensing agreements.

Statement 2 is incorrect: While the Digital Personal Data Protection Act, 2023 focuses on safeguarding personal data and privacy in the digital realm, and also contribute to the broader framework of data protection and privacy rights. However, it does not specifically enumerate or define personality rights as a standalone concept within its provisions.

1) Personality rights, are not exclusively recognized or defined by any single legislation or statute in India, including the Digital Personal Data Protection Act, 2023.

3) Instead, personality rights in India are protected indirectly through a combination of legal principles, case law, constitutional rights (such as the right to privacy), and statutes like intellectual property rights.

Statement 3 is correct: In India, the Trademarks Act, 1999 allows individuals, including celebrities, to register personal attributes such as their name, voice, signature, etc. as trademarks, providing them exclusive rights.

1) Section 14 of the Act restricts the unauthorized use of these personal representations.

2) If someone illegally uses or misrepresents a celebrity's name or likeness, they can face legal repercussions, including injunctions, damages, and lawsuits for trademark infringement.

3) This framework ensures robust protection of personality rights alongside other legal protections such as privacy and defamation laws.

Source: <https://indianexpress.com/article/explained/explained-law/delhi-hc-anil-kapoor-personality-rights-8951569/>

<https://blog.ipleaders.in/protection-of-personality-rights-in-india/>

Subject:) Polity

Topic:) Personality Rights

Subtopic:)

Q.92)

Ans) a

Exp) Option a is the correct answer.

Pair 1 is correct: The requirement for passengers seated in the rear seat of a car to wear seat belts is governed by the Central Motor Vehicle Rules (CMVR), which were framed under the Motor Vehicles Act, 1988.

1) Rule 138(3) specifically mandates that individuals seated in the front seat or those occupying front-facing rear seats must wear seat belts while the vehicle is in motion.

2) Failure to comply with this rule can result in a fine of ₹1,000.

Additionally, **Motor Vehicle (Amendment) Act, 2019** has also mandated for the driver and all the passengers seated in front and rear seats to wear seat belts, and its violation shall be fined.

Pair 2 is incorrect: Though India lacks specific laws to address deepfakes and AI-related crimes. Though section 66E of the Information Technology Act, 2000 (IT Act) is applicable in cases of deepfake crimes. Further other sections of IT Act 2000 can also be invoked in case of manipulating the original video of someone using deepfake technology. Also, provisions of the Indian Penal Code, 1860, (IPC) can also be resorted to for cybercrimes associated with deepfakes.

Pair 3 is incorrect: The Central Consumer Protection Authority (CCPA) has drafted guidelines to prevent misleading advertisements by coaching institutes. These guidelines will be issued under section 18 (2) (l) of the Consumer Protection Act, 2019.

1) Definition of "Coaching": The draft guidelines define "coaching" as tuition, instructions, academic support, learning programs, or guidance provided by any person.

2) Conditions for Misleading Advertisement: A person engaged in coaching shall be considered to be engaged in a misleading advertisement if they employ any of the following practices:

a. Concealing Important Information: Failing to disclose essential details related to the name of the course (whether free or paid) and the duration of the course opted by successful candidates. Any other critical information that can influence a consumer's decision to choose their services.

b. False Claims Regarding Success Rates: Making false claims about success rates, number of selections, or rankings of students in any competitive exam without providing verifiable evidence.

c. Attribution of Success Solely to Coaching: Falsely representing that students' success is solely attributable to the coaching, without acknowledging the individual efforts of the students. Clearly stating the extent of the coaching's involvement in their success.

d. Creating False Sense of Urgency or Fear: Using tactics that create a false sense of urgency or fear of missing out, which may heighten anxieties among students or parents.

e. Other Misleading Practices: Any other practices that may mislead consumers or subvert consumer autonomy and choice.

Source: <https://www.thehindu.com/news/national/rear-seat-belts-mandatory-but-rarely-used/article65066336.ece>

https://www.business-standard.com/article/current-affairs/seatbelts-for-drivers-and-passengers-mandatory-in-mumbai-from-november-1-122110100129_1.html

<https://www.thehindu.com/news/national/regulating-deepfakes-generative-ai-in-india-explained/article67591640.ece>

<https://pib.gov.in/PressReleaseIframePage.aspx?PRID=2006533>

Subject:) Polity

Topic:) Acts in News

Subtopic:)

Q.93)

Ans) c

Exp) Option c is the correct answer.

Pair 1 is correct: In July 2023, Nigeria's President Bola Tinubu declared a state of emergency to tackle rising food prices and shortages.

1) This step included implementing initiatives such as using funds saved from removing a fuel subsidy to provide fertilizer and grain to farmers, offering \$10 monthly aid to poorer households for six months.

2) This response was driven by a United Nations (UN) report projecting that 25 million people in Nigeria, which is Africa's most populous country, were at high risk of food insecurity in 2023 due to longstanding issues of food scarcity and widespread insecurity.

Pair 2 is correct: In 2023 Gabon's Republican Guard, a unit of the armed forces responsible for protecting the President, seized power following a disputed election in which the incumbent, Ali Bongo, was declared the winner.

1) Ali Bongo, who has been in power since 2009, succeeded his father Omar Bongo, a long-time ally of France who ruled Gabon for nearly 42 years.

2) Despite gaining international recognition for his efforts to preserve Gabon's reserve forests, which cover 90% of the country, Ali Bongo struggled to gain the same domestic support and authority as his father.

3) The coup reflected underlying political instability and dissatisfaction within the country.

Pair 3 is correct: In June 2023, Mali held a significant Constitutional Referendum that was backed by the United Nations mission (The United Nations Multidimensional Integrated Stabilization Mission in Mali (MINUSMA)) in the country.

1) This referendum was part of the broader efforts to stabilize Mali and establish a framework for political and institutional reforms.

2) MINUSMA was established as a UN peacekeeping mission in the wake of a 2012 coup and armed rebellion in Mali, and has closed its operations post referendum in Mali, in December 2023.

Source: <https://www.newsonair.gov.in/nigerias-president-bola-tinubu-declares-state-of-emergency-to-tackle-rising-food-prices-shortages/>

<https://www.thehindu.com/opinion/editorial/coup-in-gabon-on-the-trends-in-africa/article67273837.ece>

<https://minusma.unmissions.org/en>

Subject:) International Relations

Topic:) Countries in News

Subtopic:)

Q.94)

Ans) d

Exp) Option d is the correct answer.

Statement I is incorrect: On May 10, 2024, India voted in favour of an Arab Group's draft resolution at the United Nations General Assembly. This resolution stated that Palestine is qualified to be admitted as a full member of the United Nations and recommended that the Security Council reconsider the matter favourably.

The 193-member General Assembly convened for an emergency special session where the Arab Group's resolution, titled 'Admission of new Members to the United Nations' and presented by the UAE as Chair of the Arab Group, was discussed. The resolution garnered 143 votes in favour, including India's vote, 9 votes against, and 25 abstentions.

Statement II is correct: India indeed supports a two-state solution to the Israel-Palestine conflict, advocating for an independent and sovereign State of Palestine coexisting peacefully with Israel. This stance is consistently reflected in India's diplomatic actions, voting patterns at the United Nations, and official statements by Indian leaders.

1) India has a long-standing history of supporting Palestinian self-determination and was the **first non-Arab state to recognize the Palestine Liberation Organization (PLO)** as the **sole legitimate representative of the Palestinian people in 1974.**

2) In 1988, India recognized the State of Palestine after the PLO declared an independent state, and has repeatedly called for direct negotiations between Israel and Palestine to achieve a lasting peace

Hence, Statement-I is incorrect but Statement-II is correct.

Source: <https://www.thehindu.com/news/international/despite-us-opposition-un-general-assembly-backs-palestines-bid-for-full-membership/article68162573.ece>

Subject:) International Relations

Topic:) Diplomatic Relations

Subtopic:)

Q.95)

Ans) b

Exp) Option b is the correct answer.

Pair 1 is correct: Number plates with details of registration number printed in Black on yellow background:

These number plates are assigned to vehicles that are used for commercial purposes, such as taxis, rickshaw, trucks, and other vehicles used for the transportation purposes. The yellow background indicates the commercial nature of the vehicle, which is important for regulatory and law enforcement purposes.

Pair 2 is correct: Number plates with details of registration number printed in Black on white background:

These number plates are for vehicles used for personal purposes only and not for any commercial activities. The white background signifies that the vehicle is privately owned and used for personal transportation, distinguishing it from commercial vehicles.

Pair 3 is correct: Number plates with details of registration number printed in white on green background:

These number plates are designated for private electric vehicles, indicating that the vehicle runs on electric power rather than conventional fuels like petrol or diesel. The green background is used to

promote eco-friendly transportation options and to distinguish these vehicles from those running on fossil fuels.

Pair 4 is incorrect: Number plates with details of registration number printed in yellow on black background:

These plates are for **vehicles that are rented out to customers who drive themselves**. This category includes **self-drive rental cars**, where the driver is the renter rather than a hired driver. The black background with yellow digits helps in identifying these vehicles easily. The driver of such vehicle himself does not require a commercial license.

Pair 5 is incorrect: Number plates with details of registration number printed in white on blue background:

These plates are assigned to **vehicles used by diplomatic missions, consulates, and embassies**. The blue background signifies that the vehicle has diplomatic immunity and is used for official diplomatic purposes. The numbering format is also different, typically including the country code of the embassy.

Source: <https://www.financialexpress.com/auto/car-news/different-types-of-number-plates-in-india-and-their-significance/3223380/>

<https://www.indiatoday.in/education-today/gk-current-affairs/story/different-colour-number-plates-in-india-meaning-2376005-2023-05-07>

<https://telanganatoday.com/secret-behind-the-colours-on-a-number-plate>

Subject:) General Knowledge

Topic:) General Issues

Subtopic:)

Q.96)

Ans) d

Exp) Option d is the correct answer.

Sports play a vital role in the physical development of the human body. It also plays an important role in the psychological conditioning of the human brain. Therefore, sports have occupied a crucial place in the Indian way of life and culture since ages.

Statement 1 is incorrect: Sports is listed as a “State subject” (not concurrent) in the Seventh schedule of the Constitution of India. Entry 33 of State lists include “Theatres and dramatic performances; cinemas subject to the provisions of entry 60 of List I; sports, entertainments and amusements.” This means that only State Governments are empowered to make laws on matters related to Sports.

Statement 2 is incorrect: The Board of Control for Cricket in India (BCCI) is not a “National Sports Federation” under the Union Ministry of Youth Affairs and Sports. The Government of India deals only with the national level sports federations (NSFs) and grants recognition to them to become eligible to receive financial as well as other forms of assistance.

Statement 3 is incorrect: Both Rohit Sharma and Virat Kohli have been awarded with Major Dhyan Chand Khel Ratna award. Apart from these two Sachin Tendulkar, MS Dhoni and Mithali Raj has also been awarded with the award.

Statement 4 is incorrect: Arjuna award is awarded for consistent good performance over a period of four years. It is India’s second highest sporting honour after the Major Dhyan Chand Khel Ratna Award (instituted in 1991-92).

Source: <https://www.mea.gov.in/Images/pdf1/S7.pdf>

<https://yas.nic.in/sites/default/files/bcci.pdf>

<https://pib.gov.in/Pressreleaseshare.aspx?PRID=1577146>

Homepage (durandfootball.in)

<https://olympics.com/en/news/durand-cup-2023-results-scores-football>

<https://pib.gov.in/PressNoteDetails.aspx?NoteId=151772&ModuleId=3>

Subject:) Current Affairs

Topic:) Sports

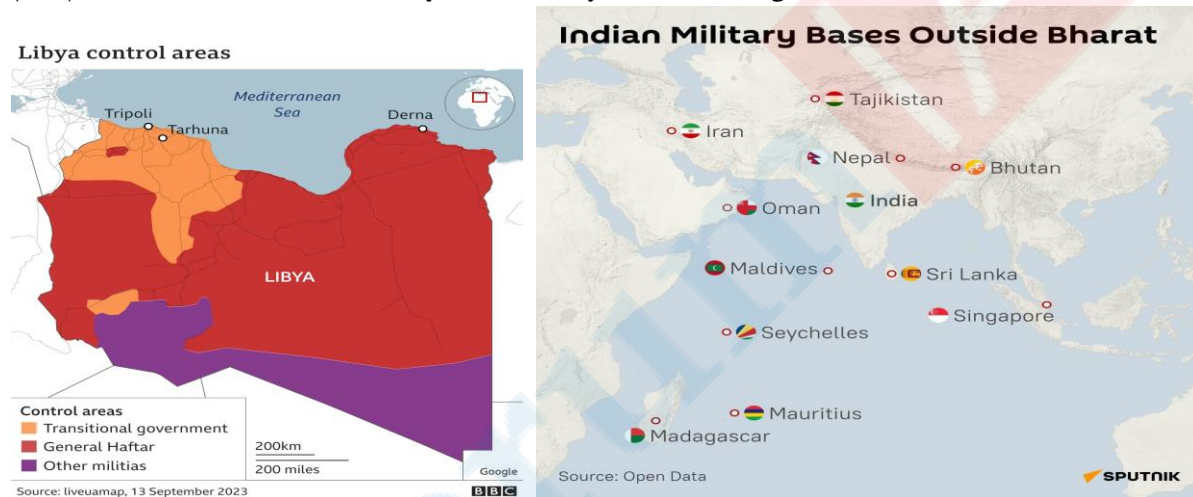
Subtopic:)

Q.97)

Ans) a

Exp) Option a is the correct answer.

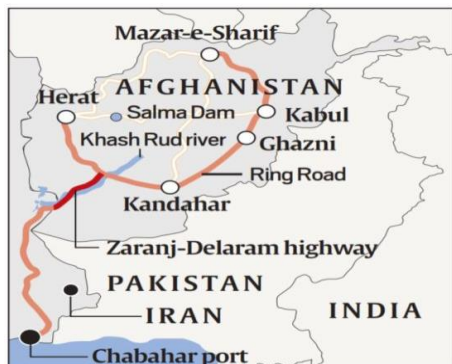
Pair 1 is incorrect: Tripoli, Libya's capital, has been in the news due to ongoing clashes between rival factions. Since the 2011 overthrow of Muammar Gaddafi, Libya has been fractured by numerous armed groups. The country is divided between the internationally recognized Government of National Unity (GNU) in Tripoli, led by interim Prime Minister Abdul Hamid Dbeibah, and an eastern administration based in Tobruk, supported by military strongman Khalifa Haftar, who leads the Libyan National Army (LNA). **India has not established any new military base in the region.**



Pair 2 is incorrect: Paletwa, a town in Myanmar near the Mizoram border, was recently seized by a rebel group. This capture poses a significant threat to the Kaladan Multi-Modal Transit Transport Project (KMTTP), which aims to connect the port of Kolkata in India with the port of Sittwe in Rakhine (Arakan State), Myanmar. The project plans to link Sittwe to Mizoram via the Kaladan River, which flows through Paletwa, and then by road. The seizure of Paletwa disrupts the security and stability necessary for the project's successful implementation and operation, potentially hindering the movement of goods and affecting both economic and strategic interests.



Pair 3 is correct: Zaranj-Delaram is mentioned in the news as the “Zaranj-Delaram highway” in Afghanistan built by India and handed over to the Afghan government, is now under Taliban control.



Knowledge Base: **The Kivu conflict** is an umbrella term for a series of protracted armed conflicts in the **North Kivu and South Kivu provinces in the eastern Democratic Republic of the Congo** which have occurred since the end of the Second Congo War.



Essequibo region is a disputed area between Venezuela and Guyana. Th long-standing territorial dispute over the Essequibo region escalated into a crisis in 2023. The region is controlled by Guyana but is claimed by Venezuela.



Source: <https://www.bbc.com/news/world-africa-68366304>

<https://www.thehindu.com/news/international/indias-kaladan-project-almost-dead-after-paletwa-fell-to-arakan-army-senior-myanmar-opposition-leader/article67825130.ece>

<https://indianexpress.com/article/explained/explained-indias-afghan-investment-7406795/>

Subject:) International Relations

Topic:) Places in News

Subtopic:)

Q.98)

Ans) c

Exp) Option c is the correct answer.



Option c is correct: The Darien Gap is a stretch of densely forested jungle across northern Colombia and southern Panama. The Darien gap covers roughly 60 miles (97 kilometres) across, the terrain is muddy, wet and unstable and in recent times it emerged as a **major route for global human migration**. Violence, insecurity and instability in their home countries cause many people to move to find a safer place to live. In 2023, more than half a million people took this route to migrate illegally to safer places, particularly the United States of America (USA).

Source: <https://www.downtoearth.org.in/blog/governance/what-is-the-darien-gap-and-why-are-more-migrants-risking-this-latin-american-route-to-get-to-the-us--95020>

Subject:) International Relations

Topic:) Places in news

Subtopic:)

Q.99)

Ans) c

Exp) Option c is the correct answer.

Carbon Nano Florets are a unique nanostructure composed of carbon atoms arranged in a distinctive floret-like morphology. They have a high surface area and various potential applications in fields such as materials science, electronics, and nanotechnology due to their exceptional properties and structure.

Statement 1 is correct: Carbon Nanoflorets are efficient for solar energy production because they can absorb sunlight across multiple frequencies, including infrared, visible, and ultraviolet. On the other hand, **photovoltaic materials absorb only visible and ultraviolet light. More than half of the energy in sunlight arrives to the earth as infrared radiation.** So, the nanoflorets can absorb much more energy from the sun.

Statement 2 is correct: Carbon nanoflorets demonstrate the capability of converting sunlight into heat with a remarkable efficiency of 87%. This is the **highest** among known materials. This property **renders Carbon nanoflorets to be used effectively in water heating applications.**

Statement 3 is correct: Carbon NanoFlorets have high surface area which makes them effective in **removing heavy pollutants, such as chromium, mercury, chromium and arsenic up to 90% from contaminated sources.**

Source: <https://www.thehindu.com/sci-tech/science/carbon-nanoflorets-iit-bombay-solar-thermal-conversation-high-efficiency/article67472739.ece>

<https://forumias.com/blog/carbon-nanoflorets/>

Subject:) Environment

Topic:) Carbon

Subtopic:)

Q.100)

Ans) c

Exp) Option c is the correct answer.

The Shanghai Cooperation Organization (SCO) is an intergovernmental organization founded on 15 June 2001 in Shanghai. The SCO **currently comprises Eight Member States** and they are **China, India, Kazakhstan, Kyrgyzstan, Russia, Pakistan, Tajikistan and Uzbekistan**.

Statement 1 is correct: Kashi (Varanasi) has been declared the **first tourism and cultural capital of the Shanghai Cooperation Organisation (SCO)**. This decision was announced at the **meeting of Heads of Shanghai Cooperation Organisation (SCO) Tourism Administrations** held in Varanasi on 17th March 2023.

Statement 2 is correct: Under India's first-ever Chairmanship, the 23rd Summit of the SCO Council of Heads of State was held in the virtual format on 4 July 2023. The summit concluded with the **New Delhi Declaration**. According to the New Delhi Declaration, the Member States will seek to develop common principles and approaches to form a unified list of terrorists, separatist and extremist organizations whose activities are prohibited on the territories of the SCO Member States.

Other pledges under New Delhi Declaration:

1) issued the statements on **exploring cooperation in digital transformation**.

2) opposed the militarization of information and communication technologies and called for a joint and balanced approach to countering the **trafficking of illicit drugs**.

Source:

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=1908014#:~:text=China%2C%20India%2C%20Kazakhstan%2C-,Kyrgyzstan,-%2C%20Russia%2C%20Pakistan%2C%20Tajikistan>

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=1908014>

<https://www.newsonair.gov.in/sco-heads-of-state-adopt-new-delhi-declaration-call-for-cooperation-to-counter-radicalization-separatism-terrorism/#:~:text=SCO%20today.%20According-,to,-the%20New%20Delhi>

Subject:) International Relations

Topic:) International Organisations

Subtopic:)