Q.1) Solution (c)

Explanation:

- **Exports as percent of GDP** — This has *not* steadily decreased over the last decade. Recent data shows the share of exports (of goods and services) in GDP has increased modestly over the 2010s into the early 2020s (e.g., from around ~19.8% in 2015 to ~21.2% in 2024). **Statement 1 is Incorrect.**
- **Imports as percent of GDP** — There isn't evidence of a consistent *steady* increase over the past decade; imports relative to GDP have fluctuated and do not show a simple upward trend throughout the entire period.) **Statement 2 is Incorrect.**
- **Trade (exports + imports) as percent of GDP** — Data shows India's overall trade-to-GDP ratio (around ~44–45% recently) has varied and even risen in recent years rather than steadily decreasing.) **Statement 3 is Incorrect.**
- **Services trade balance** — India has consistently recorded a *positive* services trade balance (i.e., surplus) over the last decade, driven by strong services exports (e.g., IT, business services) exceeding services imports. **Statement 4 is Correct.**

Q.2) Solution (a)

Explanation:

- Seigniorage refers to **the profit earned by the Central Bank from issuing money**.
- When a central bank (like the Reserve Bank of India) prints currency:
  1. The **cost of printing** a ₹500 note may be only a few rupees.
  2. But the **face value** of that note is ₹500.
  3. The difference between the **face value** and the **cost of production** is called **seigniorage**.

  Conceptual Formula:
  Seigniorage = Face Value of Money – Cost of Printing & Issuing.

Q.3) Solution (b)

Explanation:

- When trade deficit increases that means imports are increasing in the country as compared to exports. Increase in imports causes an increase in demand for dollars which results in decline in value of Indian currency. Increase in trade deficit results in money going out of the Indian economy.

Q.4) Solution (d)

Explanation:

- When foreign investors come to India, they bring dollars and this dollar they sell in forex market and demand rupees which results in increase in demand of rupee and rupee appreciates.
- When the interest rate in India increases, more foreign investors come to India to invest in debt, which results in rupee appreciation.

- When exports increase, we earn more dollars from the foreign market and this dollar we sell in the forex market to purchase rupees which results in increase in demand of rupees and rupee appreciates.
- **So, none of the statements are true.**

Q.5) Solution (a)

Explanation:

- When a currency appreciates either in nominal or real terms then export competitiveness decreases.
- If rupee is appreciating that means India's export competitiveness is decreasing but you cannot say India's exports is less competitive.

Q.6) Solution (d)

Explanation:

- A bond (debt paper) holder is expected to get a fix interest regularly and principal at maturity. But if the inflation in the economy starts increasing then interest rate also increases and the (market) price of the bond decreases and bondholders lose. When the price of the bond decreases in the market, the person who will purchase the bond will have to pay less price and hence he will get more return/yield. *(The interest rate on the bond remains fixed but its price fluctuates in the market and hence the return also fluctuates. If the market price of the bond is low, then the return/yield on the bond will be high. This is because the person who will purchase the bond will have to pay less price to get the same bond).*

Q.7) Solution (c)

Explanation:

- Currency in circulation consists of Notes and Coins. All the currency notes (except one rupee note) are liability of RBI. But one-rupee notes and coins are printed/minted by Govt. of India and hence are liability of Govt. of India.
- All the currency in circulation is not part of money supply. Only that currency in circulation which is with the PUBLIC is part of money supply. The currency with bank is not part of money supply.
- Currency in circulation = Currency with public + currency with bank
- Even if one-rupee notes and coins are minted/printed by Govt. of India, all the currency notes and coins are circulated in the economy by RBI (as per RBI Act 1934).

Q.8) Solution (c)

Explanation:

All three functions listed are part of the Reserve Bank of India's (RBI) role as the Banker to the Central Government.

1. Maintenance of Government Funds: The RBI maintains the principal accounts of the Central Government, which includes the Consolidated Fund of India, the Contingency Fund, and the Public Account of India. 2. Advisor to the Government: The RBI acts as a financial advisor to the government, providing guidance on critical financial and banking-related matters, including monetary policy, public finance, and debt management. 3. Ways and Means Advances (WMA): As the government's banker, the RBI provides Ways and Means Advances, which are short-term, temporary loan facilities intended to help the government bridge mismatches between its receipts and expenditures

- When RBI floats/raises loans on behalf of government then it is acting as a "Debt Manager" of government and not as a Banker to government**. So (iv) statement is not true.**

Q.9) Solution (d)

Explanation:

- Certificate of Deposits are negotiable/tradable, unsecured money market instruments issued by Scheduled Commercial Banks (and some All-India Financial Institutions like NHB, SIDBI etc. but mostly by banks) for a maturity period up to one year against funds deposited at the bank.
- For example, if a bank is issuing a Rs. 100 CD paper to raise money from the money market then it will have to keep some percent (of Rs. 100) as reserves. These Certificate of Deposits are different from the 'deposit certificate' that we individuals get while doing Fixed Deposit in the bank. Our 'deposit certificates' are not tradable.

Q.10) Solution (b)

Explanation:

Statement I is correct: A rise in GDP does not necessarily lead to an increase in welfare. Economic growth may occur alongside pollution, inequality, depletion of natural resources, or poor distribution of income.

Statement II is correct and explains Statement I: GDP does not account for positive externalities (like improved public health) or negative externalities (like pollution). Therefore, GDP can rise even if overall welfare declines due to unaccounted social or environmental costs.

Statement III is correct but does not explain Statement I: It correctly defines GDP as the monetary value of final goods and services produced in a country during a given period. However, this definition alone does not explain why welfare may not rise with GDP growth. Thus, only Statement II explains Statement I, while both Statements II and III are factually correct.

Q.11) Solution (a)

Explanation:

Statement 1 is Correct: Peer-to-Peer (P2P) lending platforms in India are regulated by the Reserve Bank of India (RBI). Since 2017, they have been classified as a specific category of Non-Banking Financial Companies (NBFCs) known as NBFC-P2P.
Statement 2 (They can lend on their own): This is incorrect: Under RBI guidelines, P2P platforms must function strictly as intermediaries. Their role is to match individual lenders with individual borrowers; they are prohibited from lending their own money or maintaining a balance sheet for lending activities.
Statement 3 (They provide credit guarantee): This is incorrect: RBI regulations explicitly prohibit P2P platforms from providing or arranging any credit enhancement or guarantees. The risk of default is borne entirely by the lenders, and platforms cannot promise "assured" or "guaranteed" returns

Q.12) Solution (d)

Explanation:

Statement 1 is correct: Sovereign Wealth Funds (SWFs) are state-owned investment vehicles or pools of capital.
Statement 2 is correct: They are typically established from a country's fiscal surpluses, trade surpluses, or revenues derived from natural resources (like oil) and foreign exchange reserves.
Statement 3 is correct: One of the primary roles of an SWF (specifically "Stabilization Funds") is to stabilize the budget and economy by cushioning it against excess volatility in revenues, such as fluctuations in commodity prices.
Statement 4 is incorrect: While SWFs can invest in domestic strategic projects, they typically invest globally in a wide range of diversified financial assets including foreign stocks, bonds, real estate, and private equity to maximize long-term returns. Their defining characteristic is often the investment in foreign financial assets rather than just government-owned domestic project

Q.13) Solution (d)

Explanation:

- Currency = Notes + Coins
- Monetary base = Currency held by public + Currency held by bank + deposits of banks with RBI.

Q.14) Solution (c)

Explanation:

- **There are two types of Open Market Operations (OMOs). Outright and repo**
  1. **Outright OMOs are permanent in nature:**
     when the central bank buys these securities (thus injecting money into the system), it is without any promise to sell them later. Similarly, when the central bank sells these securities (thus withdrawing money from the system), it is without any promise to buy them in future.
  2. **Repo and Reverse Repo LAF:**

This is a type of operation in which when the central bank buys the security, the agreement of purchase also has specification about date and price of resale of this security. This type of agreement is called a repurchase agreement or repo.

Similarly, instead of outright sale of securities RBI may sell the securities through an agreement which has a specification about the date and price at which it will be repurchased by RBI in future. This type of agreement is called a reverse repurchase agreement or reverse repo.

RBI conducts repo and reverse repo operations at various maturities: overnight, 7-day, 14-day etc. Whether outright OMOs or LAF, it happens at RBI's discretion i.e., when RBI feels then it will do these operations. And auction happens which decides the price.

Q.15) Solution (a)

Explanation:

• The preamble of the Indian Constitution-

• WE, THE PEOPLE OF INDIA, having solemnly resolved to constitute India into a SOVEREIGN SOCIALIST SECULAR DEMOCRATIC REPUBLIC and to secure to all its citizens:

JUSTICE, social, economic, and **political**; **Hence statement 1 is correct.**

LIBERTY of thought, expression, belief, faith, and worship; **Hence statement 2 is not correct.**

EQUALITY of status and of opportunity; and to promote among them all, **Hence statement 3 is correct.**

FRATERNITY assuring the dignity of the individual and the unity and integrity of the Nation; **Hence statement 4 is correct.**

• IN OUR CONSTITUENT ASSEMBLY this twenty-sixth day of November 1949, do HEREBY ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION.

• Preamble reveals the source of authority of the constitution which is "the authority from the people of India".

• It declares the nature of the Indian state as sovereign, socialist, secular, democratic, and republican polity.

• It specifies justice, liberty, equality, and fraternity as the objectives of the constitution.

• It also mentions the date of adoption of the constitution which is November 26, 1949.

Q.16) Solution (d)

Explanation:

- Following are some of the features of the parliamentary form of government in India:
- **Nominal and Real Executives:** The President is the nominal executive (de jure executive or titular executive) while the Prime Minister is the real executive (de facto executive). Thus, the President is head of the State, while the Prime Minister is head of the government. Article 74 provides for a council of ministers headed by the Prime Minister to aid and advise the President in the exercise of his functions. The advice so tendered is binding on the President.

- **Majority Party Rule**: The political party which secures majority seats in the Lok Sabha forms the government. The leader of that party is appointed as the Prime Minister by the President; other ministers are appointed by the President on the advice of the prime minister. However, when no single party gets the majority, a coalition of parties may be invited by the President to form the government.

- **Collective Responsibility:** This is the bedrock principle of parliamentary government. The ministers are collectively responsible to the Parliament in general and to the Lok Sabha in particular (Article 75). They act as a team, and swim and sink together. The principle of collective responsibility implies that the Lok Sabha can remove the ministry (i.e., the council of ministers headed by the prime minister) from office by passing a vote of no confidence.
- **Political Homogeneity:** Usually, members of the council of ministers belong to the same political party, and hence they share the same political ideology. In the case of the coalition government, the ministers are bound by consensus.
- **Double Membership:** The ministers are members of both the legislature and the executive. This means that a person cannot be a minister without being a member of Parliament. The Constitution stipulates that a minister who is not a member of the Parliament for a period of six consecutive months ceases to be a minister. Hence, statement 2 is correct.
- **The leadership of the Prime Minister**: The Prime Minister plays a leadership role in this system of government. He is the leader of the council of ministers, the leader of the Parliament, and the leader of the party in power. In these capacities, he plays a significant and highly crucial role in the functioning of the government. Hence, statement 3 is correct.
- **Dissolution of the Lower House**: The lower house of the Parliament (Lok Sabha) can be dissolved by the President on the recommendation of the Prime Minister. In other words, the prime minister can advise the President to dissolve the Lok Sabha before the expiry of its term and hold fresh elections. This means that the executive enjoys the right to get the legislature dissolved in a parliamentary system.
- **Secrecy**: The ministers operate on the principle of secrecy of procedure and cannot divulge information about their proceedings, policies, and decisions. They take the oath of secrecy before entering their office. The oath of secrecy to the ministers is administered by the President. Hence, statement 1 is correct.

Q.17) Solution (d)

Explanation:

• Article 25 says that all persons are equally entitled to freedom of conscience and the right to freely profess, practice, and propagate religion.
• The implications of these are:

1. Freedom of conscience: Inner freedom of an individual to mould his relation with God or Creatures in whatever way he desires.
2. Right to profess: Declaration of one's religious beliefs and faith openly and freely.
3. Right to practice: Performance of religious worship, rituals, ceremonies, and exhibition of beliefs and ideas.
   Right to propagate: Transmission and dissemination of one's religious beliefs to others or exposition of the tenets of one's religion. But it does not include a right to convert another person to one's own religion.

• From the above, it is clear that Article 25 covers not only religious beliefs but also religious practices (rituals). Moreover, these rights are available to all persons–citizens as well as noncitizens. Hence, statement 1 is not correct.

• However, these rights are subject to public order, morality, health, and other provisions relating to fundamental rights. Further, the State is permitted to:

regulate or restrict any economic, financial, political, or other secular activity associated with religious practice

provide for social welfare and reform or throw open Hindu religious institutions of a public character

to all classes and sections of Hindus.

• Under Article 28, no religious instruction shall be provided in any educational institution wholly maintained out of State funds.

• However, this provision shall not apply to an educational institution administered by the State but established under any endowment or trust, requiring imparting of religious instruction in such institution. Hence statement 2 is not correct.

• Further, no person attending any educational institution recognized by the State or receiving aid out of State funds shall be required to attend any religious instruction or worship in that institution without his consent.

• Thus, Article 28 distinguishes between four types of educational institutions:

Institutions wholly maintained by the State.

Institutions administered by the State but established under any endowment or trust.

Institutions recognized by the State.

Institutions receiving aid from the State.

• In (1) religious instruction is completely prohibited while in (2), religious instruction is permitted. In (3) & (4) religious instruction is permitted on a voluntary basis

Q.18) Solution (a)

Explanation:

- **Statement I is correct:** During a Financial Emergency (Article 360), the Union government acquires full control over the states in financial matters. The federal structure effectively becomes unitary as the Centre can issue directions that the states are constitutionally bound to follow.
- **Statement II is correct:** The President can direct states to reserve all money bills or other financial bills for his/her consideration after they have been passed by the state legislature. This is a primary mechanism through which the Centre exercises "full control" over state finances, as it allows the President to veto or modify state spending and taxation policies.
- **Statement III is correct:** The President is empowered to issue directions for the reduction of salaries and allowances of all classes of persons serving the Union, specifically including the judges of the Supreme Court and the High Courts.
- **Relationship between statements:** Both Statement II and Statement III describe specific powers granted to the Centre/President that constitute the "full control" mentioned in Statement I. By controlling the state's legislative output regarding money (Statement II) and having the authority to modify fixed financial obligations like salaries (Statement III), the Centre exerts the comprehensive financial authority described in Statement I.

Q.19) Solution (a)

Explanation:

- **Initiative** is a method by means of which the people can propose a bill to the legislature for enactment. A referendum is a procedure whereby proposed legislation is referred to the electorate for settlement by their direct votes. Any proposed law can, with sufficient backing, be put on the ballot in an election. Hence pair 1 is correctly matched.

- **Recall** is a method by means of which the voters can remove a representative or an officer before the expiry of his term when he fails to discharge his duties properly. Hence pair 2 is not correctly matched.

- A **plebiscite** is a method of obtaining the opinion of people on any issue of public importance. It is a direct vote of the qualified electors of a state in regard to some important public question. Hence pair 3 is not correctly matched.

Q.20) Solution (b)

Explanation:

• Democracy is a form of government in which the people have the authority to choose their governing legislators. Democracies and dictatorships, for the fifty years between 1950 and 2000, dictatorships have a slightly higher rate of economic growth. Economic development depends on several factors: the country's population size, global situation. Overall, we cannot say that democracy is a guarantee of economic development. Hence statement 1 is not correct.
• Non-democratic regimes often turn a blind eye to or suppress internal social differences. Democracies usually develop procedures to accommodate various social divisions leading to greater chances of producing a harmonious social life. Hence, statement 2 is correct.
• Democracy stands much superior to any other form of government in promoting dignity and freedom of the individual. Democracy in India has strengthened the claims of the disadvantaged and discriminated castes for equal status and equal opportunity. Hence, statement 3 is correct.

Q.21) Solution (a)

Explanation:

• Government is one of the major litigants in courts and to provide them legal assistance there are various Law officers which include the Attorney General, Solicitor General, and the Additional Solicitor general.
• Statement 1 is correct: Article 76 of the constitution provides for the office of Attorney General of India and he is the highest law officer in the country. The Solicitor General of India assists Attorney General to fulfil his official duties and responsibilities.
• Statement 2 is not correct: The Solicitor General of India is subordinate to the Attorney General for India. They are the second law officer of the country, assists the Attorney General, and is assisted by Additional Solicitors General for India.
• The Solicitor general of India is not debarred from private legal practice. However, some limitations are
placed on the Solicitor general to avoid any complication and conflict of duty.
o He should not advise or hold brief against the government of India

o He should not advise or hold brief in cases in which he is called upon to advise or appear for the government of India.
o He should not defend an accused person in criminal prosecutions without permission of the government of India.
o He should not accept an appointment as director in any company or corporation without the permission of the government of India.

Q.22) Solution (d)

Explanation:

• The 86th Constitutional Amendment Act, 2002 added the eleventh Fundamental duty to Part IV-A of the constitution under article 51-A. It says "To provide opportunities for education to his child or ward between the age of six and fourteen years". Hence statement 1 is correct.
• The 86th Constitutional Amendment Act also added the 'Right to Education as a fundamental right to Part III of the constitution under Article 21A. It says "The State shall provide free and compulsory education to all children of the age of six to fourteen years in such manner as the State may, by law, determine." Hence statement 2 is correct.
• It also added new article 45 to the constitution under Directive Principles of State Policy. It says "The state shall endeavour to provide early childhood care and education for all children until they complete the age of six years.". Hence statement 3 is correct.

Q.23) Solution (b)

Explanation:

• Government of India Act 1935: This was the longest act passed by British Parliament provided for the establishment of a Federation of India to be made up of provinces of British India and some or all of the Princely states. Its main provisions were:
o Abolition of provincial dyarchy and introduction of dyarchy at the centre. Hence statement 1 is correct.

1. Abolition of Indian Council and introduction of an advisory body in its place.
2. Provision for an All-India Federation with British Indian territories and princely states.
3. Elaborate safeguards and protective instruments for minorities.
4. The supremacy of the British Parliament.
5. Increase in size of legislatures, an extension of the franchise, division of subjects into three lists and retention of the communal electorate.
6. Separation of Burma from India
7. Joint sittings of both Chambers in certain cases.
8. Introduced provincial autonomy and the ministers of the provincial governments were to be
    1. responsible to the provincial legislature.

• Government of India Act 1919: Dyarchy, a system of double government was introduced for the provinces of British India. It marked the first introduction of the democratic principle into the executive branch of the British administration of India. Thus, for the first time, responsible government was seen at the provincial level.

- The size of the provincial legislative assemblies was increased. Now about 70% of the members were elected.
- The communal representation was extended and Sikhs, Europeans, and Anglo Indians were included.

Some women could also vote. In 1921, Bombay (now Mumbai) and Madras (now Chennai) became

the first provinces to give the limited vote to women. Hence statement 2 is not correct.
o This act made the central legislature bicameral.
• Indian Council Act of 1892: It increased the number of additional (non-official) members in the Central and provincial legislative councils but maintained the official majority in them.
It gave the legislature, the power of discussing the budget for the first time and addressing questions to the executive. Hence statement 3 is correct. The act made a limited and indirect provision for the use of election in filling up some of the nonofficial seats both in the Central and provincial legislative councils. The word "election" was, however, not used in the act.

Q.24) Solution (b)

Explanation:

• Benegal Narsing Rau (B.N Rau) observed that " Directive Principles are in the nature of moral precepts for the state authorities and are open to facile criticism that the constitution is not the place for moral precepts. But they have an educative value and most modern constitutions lay down general principles of this kind." Hence option (b) is the correct answer.
• Benegal Narsing Rau was the Constitutional Advisor to Constituent Assembly
• L.M. Singhvi, an eminent jurist, and diplomat said that the Directive Principles are the life-giving provisions of the Constitution.
• T.T. Krishnamachari described the Directive Principles as 'a veritable dustbin of sentiments.'
• K Santhanam has pointed out that the Directives lead to a constitutional conflict
between the Centre and the states,
between the President and the Prime Minister, and
between the governor and the chief minister.
• According to him, the Centre can give directions to the states with regard to the implementation of these principles, and in case of non-compliance, can dismiss the state government.

Q.25) Solution (a)

Explanation:

• A Uniform Civil Code is one that would provide for one law for the entire country, applicable to all religious communities in their personal matters such as marriage, divorce, inheritance, adoption, etc. Article 44 of the Constitution lays down that the state shall endeavour to secure a Uniform Civil Code for the citizens throughout the territory of India. Hence, statement 1 is correct.
• Article 44 is one of the Directive Principles of State Policy. These, as defined in Article 37, are not justiciable (not enforceable by any court) but the principles laid down therein are fundamental in governance.
• Goa is the only state in India that has a uniform civil code regardless of religion, gender, caste. Goa has a common family law. Recently, the Chief Justice of India (CJI) lauded Goa's Uniform Civil Code. Hence, statement 2 is not correct.

Q.26) Solution (c)

Explanation:

• The Constitution of India provides for State Public Service Commission (SPSC) at the state level like Union Public Service Commission (UPSC) at the centre level. Articles 315 to 323 of the Constitution deal with the composition, appointment and removal of members, functions and powers, independence of a SPSC.
• Option (a) is correct: The Chairman and members of the State Public Service Commission are appointed by the Governor of the state. Although they are appointed by the governor they can be removed by the President only. The President can remove them on the same grounds and in the same manners as he can remove the Chairman or member of UPSC.
• Option (b) is correct: A member of SPSC on ceasing to hold office is eligible for Chairman and member of UPSC, or as a Chairman of that SPSC or any other SPSC but not for any other employment under the government of India or State. Also, the Chairman of a SPSC on ceasing to hold office is eligible for appointment as the chairman or member of UPSC or chairman of any other SPSC but not for any other employment under the Government of India or a state.
• Option (c) is not correct: The expense of SPSC including the Salaries, Allowances and Pensions of the Chairman and Members of SPSC are charged on the Consolidated Fund of State (and not on the Consolidated Fund of India). They are not subject to the vote of the state legislature. Also, the conditions of service of Chairman and members cannot be varied to their disadvantages.
• Option (d) is correct: The role of SPSC is limited and recommendations made by it are only advisory in nature and hence, non-binding on the government. It is up to the state government to accept or reject the advice. however, the government have to answer to the concerned state legislature for not accepting the recommendations of the commission.

Q.27) Solution (d)

Explanation:

• All the fundamental rights in part three of the constitution provide protection against the actions of the state but some are also available against the actions of private individuals. These are
o Article 15(2): It states that no citizen shall, on grounds only of religion, race, caste, sex, place of birth, or any of them, be subject to any disability, liability, restriction, or condition with regard to access to shops, public restaurants, hotels, and palaces of public entertainment or
the use of wells, tanks, bathing ghats, roads, and places of public resort maintained wholly or partly out of State funds or dedicated to the use of the general public
o Article 17: It abolishes 'untouchability and forbids its practice in any form.
o Article 23: It prohibits traffic in human beings, begar (forced labor), and other similar forms of forced labor
o Article 24: It prohibits the employment of children below the age of 14 years in any factory, mine, or other hazardous activities like construction work or railways.
• For the violation of rights under the above articles, remedies are available against private individuals too and the state must ensure that proper action is taken.
• Hence option (d) is the correct answer.

Q.28) Solution (a)

Explanation:

• While the Prime Minister is the head of the government, the President is the head of the State. In our political system, the head of the State exercises only nominal powers. The President supervises the overall functioning of all the political institutions in the country so that they operate in harmony to achieve the objectives of the State.
• Presidents all over the world are not always nominal executives like the President of India. In many countries of the world, the President is both the head of the state and the head of the government. The President of the United States of America is the most well-known example of this kind of President. The US President is directly elected by the people. He personally chooses and appoints all Ministers. The lawmaking is still done by the legislature (called the Congress in the US), but the president can veto any law. Most importantly, the president does not need the support of the majority of members in Congress and neither is he answerable to them. He has a fixed tenure of four years and completes it even if his party does not have a majority in the Congress
• Merits of Presidential System:
    Stable government. Hence option 2 is correct.
    Definiteness in policies.
    Based on separation of powers. Hence option 3 is correct.
    Government by experts.
• Demerits of Presidential System:
    The conflict between legislature and executive.
    Non-responsible government. Hence option 4 is not correct.
    May lead to autocracy.
    Narrow representation. Hence option 1 is not correct.

Q.29) Solution (b)

Explanation:

• Statement 1 is not correct: The Indian National Satellite (INSAT) system is one of the largest domestic communication satellite systems in Asia-Pacific region with most of the operational communication satellites placed in Geo-stationary orbit/Geosynchronous Transfer Orbit. Established in 1983 with commissioning of INSAT-1B, the latest satellite in this constellation was launched in January 2020 called the GSAT-30 in the Geosynchronous Transfer Orbit (GTO) from Kourou launch base, French Guiana by Ariane-5 VA-251.
• Statement 2 is correct: The INSAT system with more than 200 transponders in the C, Extended C and Ku-bands provides services to telecommunications, television broadcasting, satellite newsgathering, societal applications, weather forecasting, disaster warning and Search and Rescue operations. GSAT-19 and GSAT-29 in the series were launched by GSLV-Mk III, which is three-stage vehicle with two solid motor strap-ons, a liquid propellant core stage and a cryogenic stage. It can launch 4-ton class of satellite to Geosynchronous Transfer orbit (GTO).
• Statement 3 is correct: HAMSAT is a Micro-satellite for providing satellite based Amateur Radio services to the national as well as the international community of Amateur Radio Operators (HAM). METSAT (renamed as Kalpana - 1 on February 5, 2003 after the Indian born American Astronaut Dr. Kalpana Chawla, who died on February 1, 2003 in the US Space Shuttle Columbia disaster) is the first in the series of exclusive meteorological satellites built by ISRO. GSAT-3, known as EDUSAT is meant for distant class room education from school level to higher education. This was the first dedicated

"Educational Satellite" that provide the country with satellite based two-way communication to class room for delivering educational materials.
• Indian Space Research Organisation has launched a special programme for School Children called "Young Scientist Programme" "YUva VIgyani KAryakram" (युविका) from the year 2019.The Program is primarily aimed at imparting basic knowledge on Space Technology, Space Science and Space Applications to the younger ones with the intent of arousing their interest in the emerging areas of Space Activities

Q.30) Solution (d)

Explanation:

• Most animals use "body language" as well as sound and smell in order to communicate with one another. Chimpanzees greet each other by touching hands. Male fiddler crabs wave their giant claw to attract female fiddler crabs. White-tailed deer show alarm by flicking up their tails.
• Many animals communicate by smell: they release pheromones (airborne chemicals) to send messages to others. Pheromones play an important part in reproduction and other social behavior. They are used by many animals, including insects, wolves, deer etc.
• Bees dance when they have found nectar. The scout bee will dance in the hive, and the dance directs other bees to the location of the nectar.
• Animals use sound to warn others to stay out of its territory and also to attract a mate. They make at least twenty-five different sounds which include growling, squawking, squealing, cooing, and rattling. • Hence option (d) is the correct answer.

Q.31) Solution (a)

Explanation:

• A pressurized heavy-water reactor (PHWR) is a nuclear reactor, commonly using unenriched natural uranium as its fuel, that uses heavy water (deuterium oxide D2O) as its coolant and neutron moderator.
• Non-Nuclear Applications of heavy water include: Preservation of Oral Polio Vaccines, Deuterated drugs for enhancement of biological efficacy, Deuterated optical fibres to enhance transmission efficiency etc.
• Heavy water is not used as a bleaching agent. Hydrogen peroxide is the simplest peroxide and is used as an oxidizer, bleaching agent and antiseptic.

Q.32) Solution (c)

Explanation:

• A cookie (called an Internet or Web cookie) is the term given to describe a type of message that is given to a web browser by a web server. The main purpose of a cookie is to identify users and possibly prepare customized Web pages or to save site login information for you.
• When you enter a website using cookies, you may be asked to fill out a form providing personal information; like your name, email address, and interests. This information is packaged into a cookie

and sent to your Web browser, which then stores the information for later use. The next time you go to the same Web site, your browser will send the cookie to the Web server. The message is sent back to the server each time the browser requests a page from the server.
• A web server has no memory so the hosted website you are visiting transfers a cookie file of the browser on your computer's hard disk so that the site can remember who you are and your preferences. This message exchange allows the Web server to use this information to present you with customized Web pages. So, for example, instead of seeing just a generic welcome page you might see a welcome page with your name on it. • Hence option (c) is the correct answer.

Q.33) Solution (a)

Explanation:

• Augmented Reality blends virtual reality and real life, but users continue to be in touch with the real world while interacting with virtual objects around them, so they can distinguish between the two.
• Virtual Reality creates an entirely fabricated world, that users would find it difficult to tell the difference between what is real and what is not. Hence, statement 1 is correct.
• VR is usually possible by wearing a VR helmet or goggles while AR does not require users to wear special glasses. Hence, statement 2 is not correct.

Q.34) Solution (b)

Explanation:

• Endoplasmic reticulum and Ribosomes.
• Ribosomes are the factories of protein synthesis. They are 70S type in prokaryotes and 80S type in Eukaryotes. When Ribosomes are attached to Endoplasmic reticulum (ER), it is called Rough ER which helps in protein synthesis.

Lysosome and Centrosome: Lysosomes are responsible for the degradation and recycling of cellular waste, while centrosomes are involved in organizing microtubules during cell division. Neither plays a significant role in synthesis.

Golgi apparatus and Mitochondria: While the Golgi apparatus modifies and packages proteins after they are synthesized, it is not the primary site of synthesis. Mitochondria are the "powerhouses" of the cell, primarily responsible for energy (ATP) production.

Q.35) Solution (a)

Explanation:

• The term "founder effect" refers to the observation that when a small group of individuals breaks off from a larger population and establishes a new population, chance plays a large role in determining which alleles (a variant form of a gene) are represented in the new population. The

particular alleles may not be representative of the larger population. As the new population grows, the allele frequencies will usually continue to reflect the original small group.
• A founder effect occurs when a new colony is started by a few members of the original population. This small population size means that the colony may have:
o reduced genetic variation from the original population.
o a non-random sample of the genes in the original population.
• Hence option (a) is the correct answer.

Q.36) Solution (d)

Explanation:

• 5G is the communications backbone that will enable revolutionary applications in other markets, including industrial, automotive, medical and even defence. For a world that is becoming increasingly connected with the Internet of Things (IoT), 5G's significant improvements in speed (at least 10 times faster than 4G, up to 10 Gbps), latency (10 times lower than 4G, down to 1 ms) and density (supporting 1 million IoT devices per square kilometre) will make many innovative applications possible – especially those in which security, reliability, quality of service, efficiency and cost are equally important.
• The Internet of Things is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.
• Edge Computing: Edge computing means taking real-time decisions close to the source of data. By locating computational intelligence close to the individual and different sources of the data, edge computing reduces latency in the implementation of a requested service. Instead of sending data through the entire core network to the cloud for processing, edge computing uses a distributed network architecture to ensure near-real-time processing with reduced delays, which would otherwise simply not be acceptable for the specific service.
• Network Slicing: Network slicing allows operators to separate the packet traffic layer from the control layer, supporting multiple applications and services running in parallel for a range of users who require different levels of quality, latency, and bandwidth. This means that 5G systems will have many logical network slices, or "fast-track lanes," to support specific applications and customers.

Q.37) Solution (b)

Explanation:

• Human Papillomavirus Vaccines (HPV) protect against infection with Human Papillomaviruses (HPV).
• HPV is a group of more than 200 related viruses, of which more than 40 are spread through direct sexual contact.
• Among these, two HPV types cause genital warts, and about a dozen HPV types can cause certain types of cancer—cervical, anal, oropharyngeal, penile, vulvar, and vaginal.
• Clinical trials have shown that HPV vaccines are highly effective in preventing cervical infection with the types of HPV they target when given before first exposure to the virus that is before individuals begin to engage in sexual activity.
• All HPV vaccines protect against at least HPV types 16 and 18, which cause the greatest risk of cervical cancer.
• It is estimated that HPV vaccines may prevent 70% of cervical cancer, 80% of anal cancer, 60% of

vaginal cancer, 40% of vulvar cancer, and show more than 90% efficacy in preventing HPV positive oropharyngeal cancers.
• Hence, option (b) is the correct answer.

Q.38) Solution (d)

Explanation:

• Viruses are acellular entities that can usually only be seen with an electron microscope. Viruses consist of a nucleic-acid core surrounded by a protein capsid with or without an outer lipid envelope. Hence it is difficult to kill virus because they lack cellular structure.
• Their genomes contain either DNA or RNA, and they replicate using the replication proteins of a host cell. Viruses are diverse, infecting archaea, bacteria, fungi, plants, and animals.
• Hence, both statements are correct.

Q.39) Solution (b)

Explanation:

- Conductors, semiconductors, and insulators are classified based on conductivity/resistivity.
- Conductors possess very low resistivity (or high conductivity).
- Semiconductors have resistivity or conductivity intermediate to conductors and insulators.
- Insulators have high resistivity (or low conductivity).
- Thus resistivity of semiconductors is more than conductors but less than insulators. **Hence statement 1 is not correct.**

• Semiconductors can be:

- Elemental semiconductors: Silicon (Si) and Germanium (Ge)
- Compound semiconductors: Examples are:
- Inorganic: CdS, GaAs, CdSe, InP, etc.
- Organic: anthracene, doped pthalocyanines, etc.
- Organic polymers: polypyrrole, polyaniline, polythiophene, etc.

• Most of the currently available semiconductor devices are based on elemental semiconductors Si or Ge and compound inorganic semiconductors. **Hence statement 2 is correct.**

Q.40) Solution (a)

Explanation:

- The red colour of blood is due to the presence of haemoglobin. It is an iron-rich compound and provides red colour to red blood cells. They are responsible for red colour of blood. White blood cells are colourless due to the lack of haemoglobin. White blood cells are also known as Leucocytes. Hence statement 1 is correct.

- The lines of defence against diseases:
- The first line of defence (or outside defence system) includes physical and chemical barriers that are always ready and prepared to defend the body from infection. These include your skin, tears, mucus, sweating etc.
- The second line of defence is a group of cells, tissues, and organs that work together to protect the body.
- This is the immune system. The cells involved are white blood cells (leukocytes), which seek out and destroy disease-causing organisms or substances. Hence statement 2nd is not correct.
- If the pathogens are able to get past the first line of defence, for example, through a cut in your skin, and an infection develops, the second line of defence becomes active. Through a sequence of steps called the immune response, the immune system attacks these pathogens.

Q.41) Solution (a)

Explanation:

• The Kessler Syndrome is a phenomenon in which the amount of junk in orbit around Earth reaches a point where it just creates more space debris, causing big problems for satellites, astronauts, and mission planners. Hence option (a) is the correct answer.
• Turner syndrome is a genetic disorder affecting girls and women. The cause of Turner syndrome is a completely or partially missing X chromosome. Turner syndrome symptoms include short stature and lack of breast development and periods. Treatment for Turner syndrome may include hormone therapy.
• Klinefelter syndrome is a genetic condition that results when a boy is born with an extra copy of the X chromosome. Klinefelter syndrome is a genetic condition affecting males, and it often isn't diagnosed until adulthood.
• Space Adaptation Syndrome is a type of motion sickness probably caused by an astronaut's inability to distinguish up from down while in orbit. This confusion results in dizziness and nausea.

Q.42) Solution (d)

Explanation:

• **Surveying and Ranging**
o Helium-neon and semiconductor lasers have become standard parts of the field surveyor's equipment. A fast laser pulse is sent to a corner reflector at the point to be measured and the time of reflection is measured to get the distance.
o The Apollo 11 and Apollo 14 astronauts put corner reflectors on the surface of the Moon for determination of the Earth-Moon distance.
o Positions of ground stations in relation to a mirror-bearing satellite can be measured with extreme accuracy by timing the reflected returns of laser pulses transmitted from those stations, which helps in verifying the continental drift.
• **Barcode Scanners**
o Supermarket scanners typically use helium-neon lasers to scan the universal barcodes to identify products. The laser beam bounces off a rotating mirror and scans the code, sending a modulated beam to a light detector and then to a computer that has the product information stored. Semiconductor lasers can also be used for this purpose.
• **Tunable Diode Laser Absorption Spectroscopy**

o (TDLAS) has proven to be a promising technology that can be used in challenging measurements in atmospheric research and monitoring pollution. Using the Beer-Lambert extinction law, at a wavelength slightly different from the absorption lines, there will be no absorption, and thus by scanning the wavelength across the absorption lines of the target gas, one can deduce the concentration of the gas molecules present in the atmosphere. The measurements are expressed in terms of parts per million, times meter, (ppm.m) or (ppmv.m). The most prominent gases released into the atmosphere are CO2, CO, O3, which destroy the chlorofluorocarbons, (CFC's), CH4, NO, NO2, etc. Hence all the four options are correct.

Q.43) Solution (b)

Explanation:

• The Integrated Coastal Surveillance Network is related to maritime domain awareness, not counter-drone defence. **Hence Option (a) is Incorrect**
• The SAKSHAM system is a real-time counter-drone Command and Control (C2) system developed for the Indian Army. **Hence Option (b) is Correct**
• The satellite-based regional navigation system of ISRO refers to NavIC, not SAKSHAM. **Hence Option (c) is Incorrect**
• The National Cyber Crime Reporting Portal deals with cyber offences and is unrelated to counter-drone systems. **Hence Option (d) is Incorrect**

Q.44) Solution (a)

Explanation:

• Project Varsha involves the construction of underground facilities to house and maintain India's nuclear-powered submarines, enhancing second-strike capability. **Hence Option (a) is Correct**
• Weather modification technology is unrelated to Project Varsha. **Hence Option (b) is Incorrect**
• Coastal desalination plants are for potable water supply and are not linked to Project Varsha. **Hence Option (c) is Incorrect**
• A flood forecasting grid pertains to disaster management, not strategic naval infrastructure. **Hence Option (d) is Incorrect**

Q.45) Solution (b)

Explanation:

• Japan conducts bilateral exercises with India such as Dharma Guardian and JIMEX, not Tiger Triumph. **Hence Option (a) is Incorrect**
• Exercise Tiger Triumph is a bilateral tri-service Humanitarian Assistance and Disaster Relief (HADR) exercise between India and the United States of America. **Hence Option (b) is Correct**
• France participates in exercises like Varuna with India, not Tiger Triumph. **Hence Option (c) is Incorrect**
• Australia engages in exercises such as AUSINDEX and Malabar, not Tiger Triumph. **Hence Option (d) is Incorrect**

Q.46) Solution (c)

Explanation:

• The World Bank publishes reports such as the World Development Report, not the World Investment Report. **Hence Option (a) is Incorrect**
• The International Monetary Fund releases reports like the World Economic Outlook, not the World Investment Report. **Hence Option (b) is Incorrect**
• The World Investment Report is published annually by the United Nations Conference on Trade and Development (UNCTAD). **Hence Option (c) is Correct**
• The World Trade Organization publishes the World Trade Statistical Review, not the World Investment Report. **Hence Option (d) is Incorrect**

Q.47) Solution (a)

Explanation:

• India and Pakistan were inducted as full members of the SCO during the 2017 Astana Summit. **Hence Statement 1 is Correct**
• Iran became a full member of the SCO in 2023. **Hence Statement 2 is Correct**
• Turkmenistan is not a full member; it participates as a neutral country and not as a member state. **Hence Statement 3 is Incorrect**

Q.48) Solution (b)

Explanation:

• Morocco is not a member of ECOWAS, though it has applied for membership. **Hence Statement 1 is Incorrect**
• Nigeria is a founding and leading member of ECOWAS. **Hence Statement 2 is Correct**
• Ghana is a member of ECOWAS. **Hence Statement 3 is Correct**
• Mali is a member of ECOWAS (though it has faced suspension in recent years). **Hence Statement 4 is Correct**
• Senegal is a member of ECOWAS. **Hence Statement 5 is Correct**
• Cameroon is not a member of ECOWAS; it belongs to the Economic Community of Central African States (ECCAS). **Hence Statement 6 is Incorrect**

Q.49) Solution (b)

Explanation:

• Darfur is a region located in western Sudan and has been affected by prolonged conflict. **Hence Option (a) is Incorrect**
• Khartoum is the capital city of Sudan, and Darfur is also a region within Sudan. **Hence Option (b) is Correct**
• Ethiopia is a neighbouring country but Darfur and Khartoum are not located there. **Hence Option (c) is Incorrect**
• Chad borders Sudan to the west, but Darfur and Khartoum are not part of Chad. **Hence Option (d) is Incorrect**

Q.50) Solution (a)

Explanation:

• The Kerch Strait connects the Black Sea with the Sea of Azov and separates Crimea from mainland Russia. **Hence Option (a) is Correct**
• The Mediterranean Sea is connected to the Black Sea via the Bosporus and Dardanelles, not the Kerch Strait. **Hence Option (b) is Incorrect**
• The Baltic Sea and North Sea are connected by the Danish Straits, not the Kerch Strait. **Hence Option (c) is Incorrect**
• The Caspian Sea is an inland water body and is not connected to the Black Sea through the Kerch Strait. **Hence Option (d) is Incorrect**

Q.51) Solution (d)

Explanation:

- This image of the Buddha from Sarnath belonging to the late fifth century CE is housed in the site museum at Sarnath. It has been made in Chunar sandstone.
- The Buddha is shown seated on a throne in the padmasana. Hence statement 2 is correct.
- It represents dhammachackrapravartana. Hence statement 1 is correct. The panel below the throne depicts a chakra (wheel) in the center and a deer on either side with his disciples. Thus, it is the representation of the historical event of dhammachakrapravartana or the preaching of the dhamma.
- The body is slender and well-proportioned but slightly elongated. The outlines are delicate and very rhythmic. Folded legs are expanded in order to create a visual balance in the picture space. Drapery clings to the body and is transparent to create the effect of integrated volume.
- The face is round, the eyes are half-closed, the lower lip is protruding, and the roundness of the cheeks has reduced as compared to the earlier images from the Kushana Period at Mathura. Hence statement 3 is not correct.
- The hands are shown in dhammachakrapravartana mudra placed just below the chest. The neck is slightly elongated with two incised lines indicating folds.
- The back of the throne is profusely decorated with different motifs of flowers and creepers placed in a concentric circle.
- The central part of the halo is plain without any decoration. It makes the halo visually impressive.

Q.52) Solution (a)

Explanation:

The Indus valley civilization is also called the Harappan culture. Archaeologists use the term "culture" for a group of objects, distinctive in style, that are usually found together within a specific geographical area and period.
The people of the Indus Valley Civilization were represented with seals and terracotta sculptures, indicating that the bull was known. The Archaeologists extrapolate (estimate) that oxen were used for ploughing.

Terracotta toy models of bullock carts suggest that this was one important means of transporting goods and people across land routes. **So, Statement 1 is correct.**

The people of the Indus Valley Civilization found that the dead were generally laid in pits in Harappan sites. Sometimes, there were differences in how the burial pit was made, with the hollowed-out spaces lined with bricks.

Some graves contain pottery and ornaments, indicating a belief that these could be used in the afterlife and Jewellery has been found in burials of both men and women.

In fact, in the excavations at the cemetery in Harappa in the mid-1980s, an ornament consisting of three shell rings, a jasper (a kind of semi-precious stone) bead and hundreds of microbeads were found near the skull of a male. In some instances, the dead were buried with copper mirrors. The Harappans did not believe in burying precious things with the dead**. So, Statement 2 is not correct.**

Seals and sealings were used to facilitate long-distance communication. A bag of goods being sent from one place to another. Its mouth was tied with rope, and on the knot was affixed some wet clay on which one or more seals were pressed, leaving an impression. If the bag reached with its sealing intact, it had not tampered with it. The sealing also conveyed the identity of the sender.

So, Statement 3 is correct.

Q.53) Solution (c)

Explanation:

- The 1st century BCE Hathigumpha inscription of the Kalinga king Kharavela refers to his retrieving an image of a Jina. This inscription is the earliest epigraphic reference to image worship in Jainism.
- The Udayagiri and Khandagiri caves in Orissa are among the oldest long-standing centres of Jaina monasticism. A large number of Jaina images and inscriptions from the Mathura area indicate the popularity of Jainism. Kharavela, the Chedi king of Kalinga (in eastern India), claims in his Hathigumpha inscription to have defied a king named Satakarni in his second regnal year. He also claims two years later, he defeated the Rathikas of the Maratha country and the Bhojas of Vidarbha, who seem to have been subordinates of the Satavahanas.
- A possible indication of Nanda military victories in Kalinga is suggested by the later Hathigumpha inscription of Kharavela, which mentions a king named Nanda building a canal and either conquering a place or taking away a Jaina shrine or image from Kalinga. So, Option (c) is correct.

Q.54) Solution (c)

Explanation:

- Faxian does not mention Nalanda University; instead, his account focuses mainly on Buddhist monasteries in various parts of north India, the number of monks and their practices, descriptions of places of Buddhist pilgrimage, and legends associated with them.
- The detailed descriptions of Nalanda university is found in the travel accounts of Chinese pilgrim Hieun Tsang (Xuanzang). So, Statement 1 is not correct.
- The Chinese pilgrim of Faxian refers to houses dispensing charity and medicine in the cities of north India, not South India. The Charaka Samhita gives details of how a hospital should be equipped. So, Statement 2 is not correct.

- The travels of Faxian in India lasted about a decade, from 337to 422 CE and took him from the northwest into the Ganga valley, right down to the eastern seaport of Tamralipti in the Bay of Bengal. Faxian refers to Tamralipti in Bengal as an important trade center on the eastern coast. These ports and towns were connected with those of Persia, Arabia, and Byzantium on the one hand and Sri Lanka,China, and Southeast Asia on the other. Faxian describes the perils of the sea route between India and China. So, Statement 3 is correct.

Q.55) Solution (c)

Explanation:

- The Mauryan Empire covered vast areas of the Indian subcontinent. It extended from the present-day North West Frontier Provinces of Pakistan to Andhra Pradesh, Odisha and Uttaranchal in India.
- The Ashokan inscriptions mention five major political centres in the empire – the capital Pataliputra and the provincial centres of Taxila, Ujjayini, Tosali and Suvarnagiri. The administrative control of the empire was strongest in areas around the capital and the provincial centres.
- The provincial centres were carefully chosen, both Taxila and Ujjayini were situated on important long- distance trade routes, while Suvarnagiri (literally, the golden mountain) was possibly important for tapping the gold mines of Karnataka.
- The city of Manyakhet in Karnataka was the capital of the Rashtrakuta Empire which arose during the 8th century AD. Thus, Manyakhet was not a major political centre of Mauryas.

Hence option (c) is the correct answer.

Q.56) Solution (a)

Explanation:

- The rules and prescriptions regarding performance, the theatre hall, acting, gestures, Rasa, and stage direction are all given in the first book of dramaturgy, Natyashastra, by Bharata (1st-century B.C.-1st century A.D.).
- The Mricchakatika (the clay-cart) by Sudraka (248 A.D.) presents a remarkable social drama with touches of grim reality. The characters are drawn from all strata of society, which include thieves and gamblers, rogues and idlers, courtesans and their associates, police constables, mendicants, and politicians. In Act III an interesting account of a burglary is given in which stealing is treated as a regular art. The interlinking of a political revolution with the private affairs of the two lovers adds new charm to the play.
- Bhavabhuti (700 A.D.), another great dramatist, is well known for his play Uttara-Ramacharitam (the later life of Rama), which contains a play within it in the last act of a love of exquisite tenderness. He is also well known for directly rebuking his critics by saying that his work was not intended for them and that some kindred soul would surely be born; time is endless and the earth broad.
- Jayadeva (12 century A.D.) is the last great name in Sanskrit poetry, who wrote the lyric poetry Gitagovinda (the song of Govinda) to describe every phase of love between Krishna and Radha – longing, jealousy, hope, disappointment, anger, reconciliation and fruition – in picturesque lyrical language. The songs describe the beauty of nature, which plays a prominent part in the description of human love.

- Hence option (a) is the correct answer.

Q.57) Solution (d)

Explanation:

- Kornish was a form of ceremonial salutation in which the courtier placed the palm of his right hand against his forehead and bent his head. It suggested that the subject placed his head – the seat of the senses and the mind – into the hand of humility, presenting it to the royal assembly.
- Chahar taslim is a mode of salutation which begins with placing the back of the right hand on the ground, and raising it gently till the person stands erect, when he puts the palm of his hand upon the crown of his head. It is done four (chahar) times. Taslim literally means submission.
- Sijda is also called Zaminbos. It is a form of respect paid to the Emperor or high authority or Divine persona. The person doing sijda performs it by touching the ground with the forehead as act of adoration or worship to God.

Hence option (d) is the correct answer.

Q.58) Solution (d)

Explanation:

Statement 1 is correct: It's from Pallava and Chola dynasties represent the eternal struggle between the forces of good and evil, in which the good ultimately triumphs.
Statement 2 is not correct: The mighty Cholas who succeeded the Pallavas and ruled over South India from the 9th to 13th centuries A.D. created the great temples at Thanjavur, Gangai Kondo Cholapuram, Darasurama, which are a veritable treasure house of their art. A good example of Chola craftsmanship in the 11th century is the relief carving of Siva as Gajsurasamaharamurti. The irate god is engaged in a vigorous dance of fierce ecstasy after having killed the elephant demon, who has given so much trouble to the rishis and his devotees. The hide of the demon is spread aloft by the god, using it as a sort of cover. Devi stands at the lower right corner as the only awe-struck spectator of the divine act of retribution.

Statement 3 is correct: The Pallava style concerns itself with a tall and slender physiognomical form. The thin and elongated limbs emphasize the tallness of the figure. The female figures are much lighter in appearance, with their slender waists, narrow chests, and shoulders, smaller breasts, sparse ornaments and garments, and generally submissive attitudes. The figure sculpture of the

Pallavas style is natural in pose and modelling. The front of the torso is almost flat, and the ornamentations are simple in high relief. Yet it is infused with a certain amount of vigor and fluid grace. A great masterpiece is the carving from Mahabalipuram showing the great goddess Durga engaged in a fierce battle with the buffalo-headed demon aided by their respective armies. Riding on her lion she is rushing at the powerful demon with great courage. He is moving away, yet watching for a moment to attack.

Q.59) Solution (d)

Explanation:

Queen Victoria's Proclamation of 1 November 1858 declared that thereafter India would be governed by and in the name of the British Monarch through a Secretary of State.
The assumption of the Government of India by the sovereign of Great Britain was announced by Lord Canning at a durbar at Allahabad in the 'Queen's Proclamation' issued on November 1, 1858.

It was by this proclamation that the governor-general acquired the additional title of 'Viceroy'. Hence statement 1 is correct.

Many of the promises made in that proclamation appeared to be of a positive nature to the Indians. As per the Queen's proclamation, the era of annexations and expansion had ended and the British promised to respect the dignity and rights of the native princes.

The Indian states were henceforth to recognize the paramountcy of the British Crown and were to be treated as parts of a single charge. Hence statement 2 is correct.

The people of India were promised freedom of religion without interference from British officials.

The proclamation also promised equal and impartial protection under the law to all Indians, besides equal opportunities in government services irrespective of race or creed. Hence statement 3 is correct.

It was also promised that old Indian rights, customs, and practices would be given due regard while framing and administering the law.

Q.60) Solution (c)

Explanation:

- Sasipada Banerjee was a social worker and leader of the Brahmo Samaj who is remembered as a champion of women's rights and education and as one of the earliest workers for labor welfare in India.
- He was the founder of several girls' schools, a widow's home.
- Banerjee became involved in the social reform movement in Bengal through the Brahmo Samaj which he joined in 1861.He set up a Workingmen's Club in 1870 and brought out a monthly journal called Bharat Sramjeebi (Indian Labour), with the primary idea of educating the workers.
- Banerjee was a member of the Temperance movement in India and was a close associate of Mary Carpenter whom he first met during her visit to India in 1866.

Hence, option (c) is the correct answer.

Q.61) Solution (a)

Explanation:

Faujdar was a military officer (whatever might be the rank) in charge of an army under the command of chief during the pre-Mughal period.

Warren Hastings restored the institution of Faujdars or military outposts in 1774 AD and asked the Zamindars to assist them in suppressing dacoits, violence and disorder. So, Statement 1 is not correct.
Bentinck, the governor-general, 1828-35, abolished the office of the SP. The collector/magistrate was now to head the police force in his jurisdiction, and the commissioner in each division was to act as the SP.

This arrangement resulted in a badly organised police force, putting a heavy burden on the collector/magistrate. Presidency towns were the first to have the duties of collector/magistrate separated. Presidency towns were the first to have the duties of collector/magistrate separated. So, Statement 2 is correct.

Q.62) Solution (b)

Explanation:

- Mirat-ul-Akbar (the first journal in Persian) was published in 1822 in Calcutta and was founded/edited by Raja Rammohan Roy. Whereas Henry Vivian Derozio started a newspaper called East Indian. So, Pair (1) is not correct.
- Indian Mirror was started as a fortnightly in 1861 by Devendranath Tagore and converted into daily newspaper by Keshab Chandra Sen in 1876. So, Pair (2) is correct.
- In Calcutta, East Indian (daily) was founded/edited by Henry Vivian Derozio in 1825 where, as Surendranath Banerjee served as an editor for the newspaper "The Bengalee," which was started by Girish Chandra Ghosh in 1862.So, Pair (3) is not correct
- Amrita Bazar Patrika was first published in 1868 by two brothers, Sisir Kumar Ghosh and Motilal Ghosh. It was first edited by Motilal Ghosh, who did not have a formal university education. So, Pair (4) is correct.

Q.63) Solution (b)

Explanation:

- Rani Gaidinliu, a Naga spiritual leader from Manipur. She joined the freedom struggle at the age of 13 years and got associated with the 'Heraka Movement'.
- Heraka was a socio-religious movement under the leadership of Gaidinliu's cousin Haipou Jadonang, which later turned into a political movement seeking to drive out the British from Manipur and thesurrounding Naga areas.
- In 1931, Gaidinliu took up the mantle of the movement and inspired her people to rebel against the British.
- She linked the movement to India's freedom struggle and spread the messages and teachings of Mahatma Gandhi among the people in the northeastern part of the country. So, Option (b) is correct.

Q.64) Solution (a)

Explanation:

- The All India Muslim League, annoyed with the Congress for not sharing power with them, established the Pirpur Committee in 1938 to prepare a detailed report on the atrocities supposedly committed by the Congress ministries.
- In the report, the committee charged the Congress with interference in the religious rites, suppression of Urdu in favor of Hindi, denial of proper representation, and oppression of Muslims in the economic sphere. So, Option (a) is correct.

Q.65) Solution (c)

Explanation:

- As an answer to the challenge of the Simon Commission, Indian political leaders organized several all-India conferences to settle communal issues and draw up an agreed constitution for India. The Congress proposals came in the form of the Nehru Report (chaired by Motilal Nehru) drafted by an all-parties committee. The Report was put up for approval before an All-Party Convention at Calcutta at the end of December 1928.
- Nehru report made the following recommendations:
- The Nehru Report recommended that India should be a federation on the basis of linguistic provinces and provincial autonomy. Hence statement 1 is correct.
- It suggested that seats in central and provincial legislatures be reserved for religious minorities in proportion to their population. Hence statement 2 is correct.
- The Report recommended the separation of Sind from Bombay and constitutional reform in the North-West Frontier Province. Hence statement 3 is not correct.
- The elections were be held on the basis of joint electorates. However a large section of the League led by Mohammed Shafi and the Aga Khan and many other Muslim communal groups were not willing to give up separate electorates. Hence statement 4 is correct.
- Dominion status on the lines of self-governing dominions as the form of government desired by Indians.
- Nineteen fundamental rights including equal rights for women, right to form unions, and universal adult sufferage.
- Full protection to cultural and religious interests of Muslims. Complete dissociation of state from religion.

Q.66) Solution (c)

Explanation:

- **Statement 1 is correct:** The air in contact with the earth rises vertically on heating in the form of currents and further transmits the heat of the atmosphere. This process of vertical heating of the atmosphere is known as convection. The convective transfer of energy is confined only to the troposphere.
- **Statement 2 is correct:** The transfer of heat through the horizontal movement of air is called advection. The horizontal movement of the air is relatively more important than the vertical movement. In middle latitudes, most of diurnal (day and night) variations in daily weather are caused by advection alone.

- In tropical regions particularly in northern India during the summer season, local winds called 'loo' is the outcome of advection process.

Q.67) Solution (d)

Explanation:

- Milam Glacier is one of the remotest yet accessible glaciers in the state of Uttarakhand. It is the largest glacier in the Kumaon Himalayas covering an area of 37 square kilometers. Milam glacier is situated 60km from Munsiyari. So, Pair 1 is not correct.
- Rupal Glacier is a glacier in the Great Himalaya subrange of the Himalayas in Gilgit-Baltistan, which is a region administered by Pakistan as an administrative territory and constitutes the northern portion of the larger Kashmir region which has been the subject of a dispute between India and Pakistan since 1947. So, Pair 2 is correct.
- Pindari glacier is located in the Trishul-Nanda Devi area of Kumaun Himalayas in the state of Uttarkhand. The glacier is about 9 kilometers long and gives rise to the Pindar river which meets the Alaknanda at Karnaprayag in the Garhwal district. So, Pair 3 is correct.
- The Shafat Glacier — Parkachik Glacier is a 14 kilometers (9 mi) long glacier in the Himalayan range in Ladakh India. It is a broken, ice-falling glacier melting at an alarming rate due to global warming. So, Pair 4 is correct.

Q.68) Solution (b)

Explanation:

- Jet streams are relatively narrow bands of strong wind in the upper levels of the atmosphere. The winds blow from west to east in jet streams, but the flow often shifts to the north and south. Jet streams flow west to east in both the hemispheres; hence, they are called Westerlies or upper-level Westerlies. So, Statement 1 is correct.
- Geostrophic winds are the horizontal wind in the upper atmosphere that moves parallel to isobars. These winds result from a balance between pressure gradient force and Coriolis force.
- Frictional force always acts opposite to air motion and reduces wind speed. Its greatest effect is near the earth's surface and rapidly decreases with height. This slowing causes the wind to be not geostrophic and, thus, slows down and reduces the Coriolis force, and the pressure gradient force becomes more dominant.
- Thus, Geostrophic winds are caused only by the Coriolis force and the Pressure Gradient force and not by the Frictional force. So, Statement 2 is not correct.

Q.69) Solution (a)

Explanation:

Warm moist summers with cool and dry winters are the characteristics of a Temperate west margin climate whose mean monthly temperature is between 40degrees F and 78 degrees F. Since it is experienced in the continental margins, there is always an influence of the sea (maritime influence). Temperate west margin climates have 3 subtypes: China, Gulf, and Natal. During winters, due to the extension of the polar cell towards the south, there will be penetration of

extremely cold winds to the continental interiors which, when contracts highly contrasting maritime hot air mass near the shorelines, causes Tornadoes in the USA.
There is a seasonal reversal of winds which makes them experience a monsoonal climate; however, since there is no complete reversal of winds relative to the China type of climate, this is called a Slight monsoonal type of climate.

The monsoonal climate provides enough moisture supply, and under the influence of maritime air mass, these areas will be frost free and thus favours the cultivation of crops like cotton and maize. Coniferous trees such as pines, firs, cedars and cypresses also grow in these regions. The above type best explains Temperate west margin climates in areas like the south-eastern U.S.A.

So, Option (a) is correct.

Q.70) Solution (c)

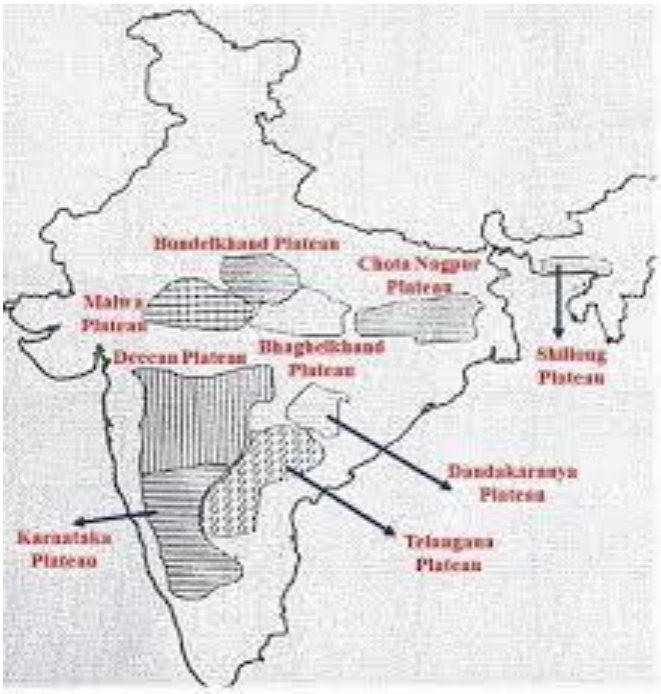
Explanation:

- Though Earth is at its farthest position on the 4th of July, this distance does not have a significant impact on the temperature of the Earth. Though annual insolation received by the earth on 3rd January is slightly more than the amount received on 4th July, this does not have a great effect on daily weather changes on the surface of the earth. So, Option (c) is not correct.

Q.71) Solution (b)

Explanation:

The Bundelkhand plateau is located between the Yamuna river in the north and the Vindhya mountain in the south.It is spread over about 69,000 sq. km. of land in seven districts of Uttar Pradesh (Chitrakut, Banda, Jhansi, Jalaun, Hamirpur, Mahoba and Lalitpur) and six districts of Madhya Pradesh (Chhatarpur, Tikamgarh, Damoh, Sagar, Datia and Panna). The 53rd Tiger reserve of India called Ranipur Tiger Reserve is located in this region. The Panna Diamond Belt (PDB), occupying the northern margin of the Vindhyan Basin in the Panna district, Madhya Pradesh. So option (b) is correct.



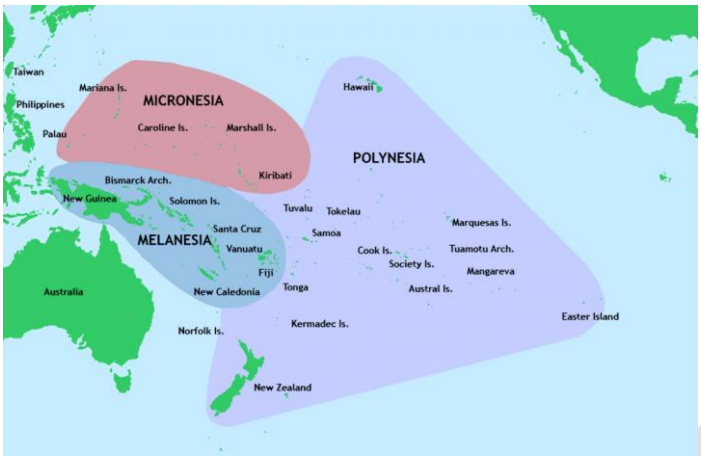
Q.72) Solution (a)

Explanation:

- Tidal vegetation grows mainly in the deltaic regions of the Ganga, Mahanadi, Godavari, and Krishna which are flooded by tides and high sea waves. Mangrove is the representative of this type of vegetation. Sundari is the typical tree of tidal forests and is found in abundance in the lower Ganga delta of West Bengal. This is the reason why it is popularly known as Sunderban. It is known for its hard and durable timber. So, Statement 1 is correct.
- These tidal areas are characterized by mud, silt, and water accumulated on the surface. Roots and branches of the trees are submerged under water for a specific period. They are also called mangrove forests and are evergreen with thick leathery leaves. So, Statement 2 is not correct.
- The deltas of the Ganga, the Mahanadi, the Krishna, the Godavari, and the Kaveri are covered by such vegetation. In the Ganga-Brahmaputra delta, Sundari trees are found, which provide durable hard timber. Palm, coconut, keora, agar, etc., also grow in some parts of the delta. So, Statement 3 is correct

Q.73) Solution (b)

Explanation:



Q.74) Solution (b)

Explanation:

Q.75) Solution (d)

Explanation:

- The Cabinet Committee on Economic Affairs has approved the investment of Rs.4526.12 crore for the 540 Megawatt (MW) Kwar Hydro Electric Project located on river Chenab in the Kishtwar district of Union Territory of Jammy and Kashmir.
- The project would be implemented by Chenab Valley Power Projects Private Ltd., a joint venture between the NHPC and the Jammu and Kashmir State Power Development Corporation, with equity contributions of 51% and 49%.
- The company has been entrusted with the construction of hydropower projects on a build, own, operate and maintain (BOOM) basis with an aggregate installed capacity of 3,094 MW. So, Statement 1 is not correct.
- The Bhaga river originates from Surya taal lake, which is situated a few kilometers east of the Bara- lacha la pass in Himachal Pradesh. The Bhaga river transverses through narrow gorges a distance of 60 km (37 mi) before the confluence at Tandi. The Bhaga River is a tributary of the Chenab River, which is also known as the Chandrabhaga River. The tributary originally starts from the Suraj Tal, which is a few kilometers from Baralacha Pass. Further, the Chandra River, which meets the Bhaga River at Tandi to form the Chandrabhaga, originates from a glacier in the Baralacha La region. Thus River Beas is not called Chandrabhaga. So, Statement 2 is not correct.

Q.76) Solution (b)

Explanation:

- **Statement I is correct**: Anticyclones are high-pressure systems characterized by **descending air** (subsidence). As air sinks, it warms adiabatically, which inhibits cloud formation and leads to **stable weather**, **clear skies**, and **dry air**.
- **Statement II is correct**: Due to the Coriolis effect, winds in an anticyclone flow outward (diverge) from the center and rotate **clockwise in the Northern Hemisphere** and **counterclockwise in the Southern Hemisphere**.
- **Relationship**: While both statements accurately describe characteristics of an anticyclone, Statement II (rotational direction) is a consequence of the Coriolis effect on horizontal wind movement and does not explain the physical cause of the stable weather described in Statement I. The stable weather is instead explained by the **sinking (subsidence) of air** in the high-pressure center

Q.77) Solution (b)

Explanation:

- Particulate matter which is also called as particle pollution is the term for a mixture of solid particles and liquid droplets found in the air.
- Tropospheric pollution occurs due to the presence of undesirable solid or gaseous particles in the air. The following are the major gaseous and particulate pollutants present in the troposphere,

- The Gaseous air pollutants are oxides of sulphur, nitrogen and carbon, hydrogen sulphide, hydrocarbons, ozone, and other oxidants
- The Particulate pollutants are dust, mist, fumes, smoke, smog, etc. So, Option (b) is correct.

Q.78) Solution (b)

Explanation:

Horizon scanning is a technique to detect the early predictions of potentially important developments through a systematic examination of threats and opportunities, emphasizing new technology and its effects that are likely to have important consequences over the next decade.
It helps in assessing whether one is adequately prepared for future changes or threats. If performed consistently and effectively, horizon scanning, when combined with other forecasting tools, can assist in policy making by identifying important needs or gaps. It is also an effective tool for bringing experts in different subject areas together to discuss a common issue and develop viable solutions. So, Option (b) is correct.

Q.79) Solution (d)

Explanation:

- Green, un-decomposed material used as manure is called green manure. Green manuring is growing in field plants usually belonging to the leguminous family and incorporated into the soil after sufficient growth. The plants that are grown for green manure are known as green manure crops. Green manures are crops grown specifically to maintain soil fertility and structure. **So, Statement 1 is correct.**
- Gliricidia (Gliricidia sepium): Often referred to as a "quickstick" or "madre de cacao," its leaves are high in nitrogen and are commonly used as green manure, fodder, and for live fencing. It is particularly known for its ability to increase soil organic matter and nutrient content, with studies showing that it can significantly boost yields in crops like coconut and castor. Pongamia (Pongamia pinnata): Also known as Indian Beech or Karanj, it is a versatile tree that provides green leaves for manure. It is nitrogen-fixing and is often grown on field bunds for its leaves, which can provide 3.2% to 3.7% nitrogen in their cake form. Subabul (Leucaena leucocephala): Known for its rapid growth, this legume is used for high-protein fodder and as a green manure. It thrives in tropical climates and helps in reclaiming wasteland while providing organic material for soil enhancement. **So, Statement 2 is correct.**
- Farmers are prevalent in high-intensed agricultural practices so that they will cultivate two-three crops in a year, which requires lots of chemical fertilisers such as urea, and diammonium phosphate (DAP), leads to deficiencies of micronutrients (iron and zinc) and thus affecting the productivity of the soil; therefore, green manuring helps improve soil health and enhance the productivity of the crops. **So, Statement 3 is correct.**

Q.80) Solution (a)

Explanation:

- A black hole is a place in space where gravity pulls so much that even light cannot get out. Gravity is so strong because matter has been squeezed into a tiny space. This can happen when a star is dying. According to the Singularity theory, at the centre of a black hole is the ultimate no man's land, which is a place where matter is compressed down to an infinitely tiny point, and all conceptions of time and space completely break down. So, Statements 1 and 2 are correct.

- Our Sun is an average-sized star. The sun is much smaller in size to become a black hole at the end of the life cycle. The Sun would need to be about 20 times more massive to end its life as a black hole. Stars that are born this size or larger can explode into a supernova at the end of their lifetimes before collapsing back into a black hole, an object with a gravitational pull so strong that nothing, not even light, can escape. The life cycle of Sun will end up as a white dwarf not as Black hole. So, Statement 3 is not correct.

Q.81) Solution (d)

Explanation:

- Contactless payment technology allows transactions without requiring physical contact between the card and the terminal.
- Near-field communication (NFC) is a short-range wireless technology that makes your smartphone, tablet, wearables, payment cards, and other devices even smarter. Near-field communication is the ultimate in connectivity. With NFC, you can transfer information between devices quickly and easily with a single touch—whether paying bills, exchanging business cards, downloading coupons, or sharing a research paper. NFC began in the payment-card industry and is evolving to include applications in numerous industries worldwide.
- Magnetic secure transmission, or MST, uses "magnetic" signals to connect the user's mobile device and the terminal. This process essentially mimics the magnetic connection created when swiping traditional credit cards.
- The primary advantage of MST technology is that it works on most NFC-ready terminals. MST-enabled devices work with most types of readers that don't require you to insert cards into the terminal. Users hold their phone next to where a card would be swiped to initiate a connection. In other words, contactless payments work with older, pre-chip terminals using magnetic signals.
- Radio-Frequency Identification (RFID) uses radio waves to read and capture information stored on a tag attached to an object. RFID allows the cardholder to wave the RFID card in front of a contactless payment terminal to complete a transaction.
- The RFID chip in the credit card is not powered and relies on radio frequency (RF) energy transferred from the powered contactless payment terminal to the card to power the chip-on-card. Because contactless purchases do not require a signature or PIN entry, banks set a maximum purchase limit per transaction.
- So, Option (d) is correct.

Q.82) Solution (c)

Explanation:

- Microwaves are a form of electromagnetic radiation whereby the waves are reflected within the metal interior of the oven that is absorbed by the food. Microwaves cause water molecules in the food to vibrate, producing heat that cooks the food. That's why microwave oven cooks foods with high water content more quickly. So, Option (c) is correct.

Q.83) Solution (c)

Explanation:

- The Indian Navy launched project 17 Alpha frigates (P-17A) in 2019. The defense forces of India launched the project to construct a series of stealth guided-missile frigates, which are currently being constructed by Mazagon Dock Shipbuilders (MDL) and Garden Reach Shipbuilders & Engineers (GRSE). Therefore, Statement 1 is correct.
- Project 15 Bravo (P15B) / Visakhapatnam-class is the latest stealth guided-missile destroyer of the Indian Navy. These ships have been designed indigenously by the Indian Navy's Directorate of Naval Design, New Delhi. Therefore, Statement 2 is not correct.
- Surat and Udaygiri were Indian-made, indigenously built frontline warships launched at Mumbai's Mazagon Docks. While Surat is the fourth guided missile destroyer under the Indian Navy's Project 15B, stealth frigate Udaygiri is part of Project 17A. There, Statement 3 is correct.

Q.84) Solution (a)

Explanation:

- Measles is a highly contagious virus that lives in an infected person's nose and throat mucus, and it is normally passed through direct contact and the air. The virus infects the respiratory tract, and then spreads throughout the body. Measles is a human disease and is not known to occur in animals. The measles virus is a single-stranded RNA virus of the genus Morbillivirus and the family Paramyxoviridae. So, Statement 1 is not correct.
- Rubella, or German measles, is an infection caused by the rubella virus. Congenital rubella syndrome occurs when a pregnant person contracts the rubella virus, passing through the placenta to the unborn child. A woman who catches rubella during pregnancy can transfer the virus to her baby through her bloodstream. A baby born with rubella is said to have congenital rubella syndrome.
- Pregnant women who contract rubella are at risk for miscarriage or stillbirth, and their developing babies are at risk for severe birth defects with devastating, lifelong consequences. So, Statement 2 is correct.
- Universal Immunization Programme (UIP) is one of the largest public health programmes targeting nearly 2.67 crore new-borns and 2.9 crore pregnant women annually.
- It is one of the most cost-effective public health interventions and is largely responsible for reducing the vaccine-preventable under-5 mortality rate. Measles-Rubella (MR) vaccine is a part of India's Universal Immunization Programme (UIP). Since India is committed to measles elimination and rubella control, the Measles-Rubella (MR) vaccine was introduced in 2017, and It has set a target to eliminate Measles-Rubella by 2023. So, Statement 3 is correct.

Q.85) Solution (c)

Explanation:

- Voice over Internet Protocol (VoIP) is a technology that allows you to make voice calls using an Internet connection rather than an analog (traditional) phone line.
- Here the Voice is converted into a digital signal by VoIP services that travel over the Internet. But if the regular phone number is called, the signal is converted to a regular telephone signal i.e. an analog signal before it reaches the destination.
- VoIP allows a person to make a call directly from a computer or a special VoIP phone.
- Some VoIP services allow you to call multiple people at the same time, while others may allow you to call anyone. They can have or do not have a phone number, which includes local, long-distance, mobile, and international numbers. Thus, this service has an option to speak more than one person at a time.
- All VoIP needs a high-speed Internet connection which can be through a cable modem or high-speed services such as a local area network. So, Statement 1, 2 & 4 are correct and Statement 3 is not correct.

Q.86) Solution (d)

Explanation:

Statement 1 is correct: Ecological succession is categorized based on the moisture level of the habitat. Hydrarch succession (hydrosere) begins in water or very wet areas and progresses toward a mesic (medium moisture) condition. Xerarch succession begins in very dry areas, such as bare rock or sand, and also progresses toward a mesic condition.

Statement 2 is correct: Primary succession occurs on surfaces where no living organisms ever existed (e.g., bare rock, newly cooled lava). It is a very slow process because it requires the initial formation of soil by pioneer species like lichens. In contrast, secondary succession occurs in areas where a previous community was destroyed but soil is already present (e.g., after a forest fire), making the reach for a climax community much faster

Q.87) Solution (d)

Explanation:

The Decomposers break down complex organic matter into inorganic substances like carbon dioxide, water and nutrients and the process is called decomposition. Dead plant remains such as leaves, bark, flowers and dead remains of animals, including fecal matter, constitute detritus, which is the raw material for decomposition. The important steps in the process of decomposition are fragmentation, leaching, catabolism, humification and mineralization.

- Detritivores (e.g., earthworms) break down detritus into smaller particles. This process is called fragmentation.
- By the process of leaching, water-soluble inorganic nutrients go down into the soil horizon and get precipitated as unavailable salts.

- Bacterial and fungal enzymes degrade detritus into simpler inorganic substances. This process is called as catabolism.
- Humification and mineralization occur during decomposition in the soil. Humification leads to the accumulation of a dark coloured amorphous substance called humus that is highly resistant to microbial action and undergoes decomposition at an extremely slow rate. Being colloidal in nature it serves as a reservoir of nutrients.
- The humus is further degraded by some microbes and release of inorganic nutrients occur by the process known as mineralization. So, Option (d) is correct.

Q.88) Solution (d)

Explanation:

The description provided matches that of a **Temperate deciduous forest.**

Here is why:

Leaves/Seasons: Trees in temperate deciduous forests shed their leaves in autumn to conserve water during the cold winter and grow new foliage in spring.

Climate: They are found in moderate climates with four distinct seasons, featuring temperatures that can drop below freezing in winter and warm summers, with annual rainfall between 75 and 150 cm.

Soil: These forests have brown soils (often brown podzols or mollisols) that are rich in nutrients, supported by the decomposition of shed leaves.

Structure: They exhibit clear vertical stratification (layered structure) consisting of a canopy, understory of smaller trees, shrubs, and herbs.

Animals: Hibernation (winter sleep) or dormancy is a common adaptation for animals in this biome to survive the long, cold winter.

Why other options are incorrect:

(a) Boreal forest: These are dominated by coniferous, evergreen trees (taiga) and have much harsher, colder climates.

(b) Tropical rainforest: These are evergreen, do not have a cold winter, and have poor soil due to leaching.

(c) Temperate rainforest: These are generally dominated by evergreen conifers (e.g., in the Pacific Northwest) and do not have a distinct leafless period

Q.89) Solution (a)

Explanation:

The pyramid of energy represents the total amount of energy at each trophic level. An energy pyramid is most suitable to compare the functional roles of the trophic levels in an ecosystem. An energy pyramid reflects the laws of thermodynamics, with the conversion of solar energy to chemical energy and heat energy at each trophic level and with loss of energy being depicted at

each transfer to another trophic level. Hence, the pyramid is always upward; Energy pyramids are never inverted, with a large energy base at the bottom. So, Option (a) is correct.

Q.90) Solution (d)

Explanation:

All five substances mentioned are recognized by International Standards (such as the World Health Organization (WHO) and the Bureau of Indian Standards (BIS)) as having specific limits or guidelines for presence in drinking water.

Fluoride: Essential at low levels (up to 1.0–1.5 mg/L) to prevent dental caries, though excess leads to fluorosis.

Aluminium: Commonly used as a coagulant in water treatment; international guidelines often set a limit around 0.1–0.2 mg/L to prevent discoloration or health concerns.

Sulphate: Naturally occurring; standards generally suggest a limit of 200–400 mg/L to avoid a bitter taste or laxative effects.

Manganese: An essential mineral with a guideline value (often 0.1–0.4 mg/L) to prevent neurological issues and aesthetic problems like black staining.

Cadmium: A highly toxic heavy metal with a very strict safety limit (usually 0.003 mg/L) because it can cause kidney damage.

Q.91) Solution (a)

Explanation:

Boreal forest (Taiga) soils are indeed characterized by thin podzols. These soils are acidic due to the slow decomposition of coniferous needles, which release organic acids, and they are mineral deficient because the intense leaching process removes vital nutrients. **Hence, Statement I is correct**

In high-latitude boreal regions, precipitation exceeds evapotranspiration. Because there is no strong upward movement of water (capillary action) driven by evaporation to bring minerals back to the surface, the downward movement of water dominates, leaching essential soluble nutrients deep into the soil profile. **Statement II is correct and provides the reason for the soil's condition.**

Q.92) Solution (c)

Explanation:

Statement 1 is incorrect: While kelp forests are underwater ecosystems in shallow water, they are formed by brown algae (order Laminariales), not blue-green algae (cyanobacteria).

Statement 2 is incorrect: Kelp are autotrophs (specifically photoautotrophs), not heterotrophs. They produce their own food through photosynthesis, which is why they are restricted to shallow waters where sunlight can penetrate. While they do thrive in cold, nutrient-rich waters, the term "heterotroph" makes the statement false.

Statement 3 is correct: El Niño Southern Oscillation (ENSO) events, particularly the warm phase (El Niño), bring warm, nutrient-poor waters to regions like the California coast. This causes "distortion" or severe degradation of the kelp ecosystem because kelp relies on cold, nutrient-rich environments and cannot survive prolonged thermal stress

Q.93) Solution (b)

Explanation:

Statement 1 is correct: Environmental Impact Assessment (EIA) is fundamentally a management tool used to identify and predict the environmental consequences of a project to ensure that natural resources are used optimally for sustainable development.

Statement 2 is correct: The EIA process involves an Appraisal Committee (specifically the Expert Appraisal Committee or EAC at the Central level and the State Level Expert Appraisal Committee or SEAC at the State level) to screen, scope, and evaluate project proposals before granting environmental clearance.

Statement 3 is incorrect: EIA is not mandatory for all projects. Under the Environment Protection Act 1986 and subsequent notifications (like EIA Notification 2006), it is mandatory only for specific categories of developmental projects (Category A and Category B) that meet certain investment or environmental impact thresholds. Smaller projects or those not listed in the notification's schedule do not require a formal EIA

Q.94) Solution (b)

Explanation:

Based on biological classification, the animals listed are categorized as follows:

I. **Kangaroo:** These are well-known marsupials native to Australia, characterized by giving birth to underdeveloped young that continue to grow in the mother's pouch.
II. **Koala:** Often mistakenly called "bears," koalas are actually marsupials that carry their offspring in a pouch.

Why other options are incorrect

III. **Platypus:** Although native to Australia, the platypus is a monotreme (an egg-laying mammal), not a marsupial.
IV. **Red panda:** Despite its name, the red panda is a placental mammal native to the Himalayas and China; it is more closely related to weasels and raccoons than to marsupials.

Q.95) Solution (b)

Explanation:

Statement 1 is Incorrect: They are endemic to India. While they are found in India, they are native to the Indian subcontinent (specifically northern India and southern Nepal), not just India.

Statement 2 is correct: They mark their territorial boundaries by Scent-marking. They use dung heaps (middens) and urine to mark territories and communicate.

Statement 3 is correct: They have a gestation period of 16 months, after which the female rhinos usually leave a gap of 3 years for the next pregnancy: They have a gestation of 15–16 months, and birth intervals are usually 3–4 years (or 34–51 months).

Statement 4 is incorrect: Their horns are permanent and, if damaged it doesn't regrow (Incorrect): Rhino horns are composed of keratin (like hair/nails) and can regrow if broken or cut.

Q.96) Solution (c)

Explanation:

- Moltbook is a new online platform where artificial intelligence agents interact with each other without direct human participation. It was launched in January 2026 by developer Matt Schlicht. It allows AI systems to post, interact, and exchange information in a shared digital space. **Hence, statement 1 is correct.**
- It is designed as a machine-to-machine space where discussions range from technical issues to philosophical topics like "consciousness" or identity. The agents generate text based on patterns they learned from training data and from interactions. **Hence, statement 2 is correct.**

Q.97) Solution (a)

Explanation:

- Monetary Policy Committee (MPC) was established in 2016 following an amendment to the RBI Act, 1934 (specifically Section 45ZB). The MPC replaced the previous arrangement of the Technical Advisory Committee. MPC will have six members: the RBI Governor (Chairperson), the RBI Deputy Governor in charge of monetary policy, one official nominated by the RBI Board, and the remaining three members would represent the Government of India. **Hence, statement 1 is correct.**
- Decisions are made by majority vote, with each member having one vote. In the event of a tie, the RBI Governor has a casting vote. It is required to meet at least four times a year. The quorum for a meeting shall be four Members, at least one of whom shall be the Governor and, in his absence, the Deputy Governor, who is the Member of the MPC. The decision of the MPC would be binding on the RBI. **Hence, statements 2 and 3 are not correct.**

Q.98) Solution (b)

Explanation:

- PAIMANA stands for Project Assessment, Infrastructure Monitoring & Analytics for Nation-building . It is a flagship initiative of the Ministry of Statistics and Programme Implementation (MoSPI). **Hence, statement 1 is not correct.**
- It functions as a centralised national repository of infrastructure projects, enabling web-generated analytical reports and enhancing data accuracy, and operational efficiency. It is integrated with DPIIT's Integrated Project Monitoring Portal (IPMP/IIG-PMG) through APIs. It

features real-time dashboards with drill-down capabilities, enabling users to monitor progress across sectors, states, and timelines. **Hence, statements 2 and 3 are correct.**

Q.99) Solution (a)

Explanation:

- Exercise Khanjar is the Joint Special Forces Exercise held between India and Kyrgyzstan. Initiated in December 2011 in Nahan, India. It became an annual event following PM Narendra Modi's 2015 visit to the Kyrgyz Republic. The exercise is conducted annually, alternating between India and Kyrgyzstan. **Hence, option a is the correct answer.**

Q.100) Solution (b)

Explanation:

- Mons Mouton is officially named Mons Mouton after NASA mathematician and computer programmer Melba Roy Mouton. It is located near the South Pole of the Moon. It is situated in the South Circumpolar Region (SCR) of the Moon. It stands about 6,000 metres high (comparable to some of the highest peaks on Earth) and spans nearly 100 km in width. It is believed to have formed as part of the rim uplift of the South Pole–Aitken basin following ancient massive asteroid impacts. **Hence, option b is the correct answer.**