Q.1) Solution (a)

Explanation:

- A volcano is an opening in the Earth's crust that allows magma, ash and gasses to erupt from below the surface. It is made up of a magma chamber, a vent, a crater and a cone-shaped mountain made of layers of ash and lava. Acidic lava has a high silica content and this makes it thicker. Basic lava contains less silica, this allows the gasses to escape and gives a runny lava. **Hence, statement 1 is not correct.**
- Basic lavas are the hottest lavas and are highly fluid. They are dark-colored like basalt, rich in iron and magnesium but poor in silica. Acidic lavas are highly viscous with a high melting point. They are light colored, of low density and have a high percentage of silica. **Hence, statement 2 is correct.**
- Due to the high level of dissolved gas, Acidic lava is violent and has a steep-sided cone. These are known as Cone Volcanoes. Basic lava Volcanoes will have gently sloping sides. They are known as Shield volcanoes. **Hence, statement 3 is not correct.**

Q.2) Solution (a)

Explanation:

- Bergschrund is a very wide and deep crevasse (a deep open crack) present near the head of the glacier. It is formed due to the pulling of the thick ice downwards. **Hence, pair 1 is correctly matched.**
- Aretes are two adjacent cirques filled with glacial ice that carve a sharp ridge line. Arete is narrow, serrated ridges and forms in two ways. In many cases, cirques form on opposite sides of a ridge and headward erosion reduces the ridge until only a thin partition of rock remains. **Hence, pair 2 is not correctly matched.**
- Horn is a pyramid-like sharp peak formed when three or more cirques meet. The most majestic of all mountain peaks are horns, steep-walled, pyramidal peaks formed by headward erosion of cirques. For a horn to form, a mountain peak must have at least three cirques on its flanks, all of which erode headward. **Hence, pair 3 is not correctly matched.**

Q.3) Solution (c)

Explanation:

- The Indian plate includes Peninsular India and the Australian continental portions. The subduction zone along the Himalayas forms the northern plate boundary in the form of continent—continent convergence. In the east, it extends through the Rakinyoma

Mountains of Myanmar towards the island arc along the Java Trench. **Hence, statements 1 and 2 are correct.**

- The Western margin follows the Kirthar Mountain of Pakistan. It further extends along the Makrana coast and joins the spreading site from the Red Sea rift southeastward along the Chagos Archipelago. The boundary between India and the Antarctic plate is also marked by an oceanic ridge (divergent boundary) running in roughly W-E direction and merging into the spreading site, a little south of New Zealand. **Hence, statement 3 is correct.**

Q.4) Solution (c)

Explanation:

- Yardangs are a stream-lined hill, carved from bedrock or any consolidated or semi consolidated material by the dual action of wind abrasion, dust and sand and deflation. These become elongated features typically three or more times longer than wide and when viewed from above, resemble the hull of a boat. They are commonly (i) asymmetrical in shape perhaps because of slight inconsistency in wind direction and (ii) show elongated leeward tails. **Hence, statement 1 is correct.**
- Zeugen are tabular masses which have a layer of soft rocks lying beneath a surface layer of more resistant rocks. The sculpting effects of wind abrasion wear them into a weird-looking ridge and furrow landscape. Mechanical weathering initiates their formation by opening up joints of the surface rocks. Wind abrasion further 'eats' into the underlying softer layer so that deep furrows are developed. The hard rocks then stand above the furrows as ridges or zeugen. **Hence, statement 2 is correct.**
- Inselbergs are isolated residual hills rising abruptly from the level ground. They are characterised by their very steep slopes and rather rounded tops. They are often composed of granite or gneiss and are probably the relics of an original plateau which has been almost entirely eroded away. These are typical of many desert and semi-arid landscapes in old age e.g. those of northern Nigeria, Western Australia and the Kalahari Desert. **Hence, statement 3 is correct.**

Q.5) Solution (b)

Explanation:

- Arthur Holmes in the 1930s discussed the possibility of convection currents operating in the mantle portion. These currents are generated due to radioactive elements causing thermal differences in the mantle portion. Holmes argued that there exists a system of such currents in the entire mantle portion. The mobile rock beneath the rigid plates is believed to be moving in a circular manner. The heated material rises to the surface, spreads and begins to cool and then sinks back into deeper depths. This cycle

is repeated over and over to generate what scientists call a convection cell or convective flow. Heat within the earth comes from two main sources: radioactive decay and residual heat. **Hence, option b is the correct answer.**

Q.6) Solution (c)

Explanation:

- Eluviation is the process by which material is leached out and transported from one soil layer to another soil layer by percolating fluid. Thus, eluviation tends to create porous layers. The rate of eluviation is influenced by rainfall, high temperatures and the removal of protective vegetation. Eluviation can result in the elimination of all but the most insoluble materials, such as quartz, hydroxides of iron and aluminum and iron oxides. Thus, eluviation is easier to detect from lag deposits made up of residual insoluble minerals. It also plays an important role in ecosystems such as in forests, by recycling soil nutrients. **Hence, option c is the correct answer.**

Q.7) Solution (c)

Explanation:

- Ubiquitous industries are industries that are inseparable from the immediate markets that they serve and are widely distributed/found everywhere. For example, telecommunications (Telkom). Ubiquitous industries" are the types of businesses that are found all over the place and have a big impact on our lives. They are really important and are part of many different parts of our society, economy, and the way we use technology. These industries are everywhere, they affect a lot of things, and we depend on them in many ways. **Hence, option c is the correct answer.**

Q.8) Solution (d)

Explanation:

- Water vapor present in the air is known as humidity. The amount of water vapor in the atmosphere is added or withdrawn due to evaporation, condensation and deposition processes. Frost is a thin, white, ice-like deposit that forms on cold surfaces when water vapor undergoes deposition at temperatures below freezing point (0° C). The ideal conditions for the formation of white frost are the same as those for the formation of dew, except that the air temperature must be at or below the freezing point. **Hence, option d is the correct answer.**

Q.9) Solution (d)

Explanation:

- An air mass is a large body of air with generally uniform temperature and humidity. It has similar characteristics to the region over which it originates and stays over its source region, the more likely it will acquire the properties of the source region which are large surfaces with uniform temperatures and humidity. Air masses can extend thousands of kilometers in any direction and can reach from ground level to the Stratosphere which is 16 kilometers (10 miles) into the atmosphere. Unlike the lower atmosphere, where air masses are primarily determined by horizontal temperature and moisture gradients, the stratosphere exhibits more uniform conditions across vast regions. **Hence, statement 1 is not correct.**
- Air masses are also identified based on whether they form over land or over water. Maritime air masses form over the water and are humid. Continental air masses form over land and are dry. **Hence, statement 2 is not correct.**
- Air masses are classified based on their region of origin as follows:
    - Arctic air masses: Originate over the Arctic or Antarctic regions and therefore are very cold.
    - Polar air masses: Originate over the higher latitudes of both land and sea and are therefore not as cold as Arctic air masses.
    - Tropical air masses: Originate over the lower latitudes of both land and sea and therefore are warm/hot. **Hence, statement 3 is not correct.**

Q.10) Solution (c)

Explanation:

- Water vapor is a variable gas whose concentration differs from region to region in the troposphere and decreases with increasing altitude. In the warm and wet tropics, it may account for four percent of the air by volume, while in the dry and cold areas of desert and polar regions, it may be less than one percent of the air. Water vapour also decreases from the equator towards the poles. It also absorbs parts of the insolation from the sun and preserves the earth's radiated heat. **Hence, statements 1 and 3 are correct.**
- The atmospheric dust particles originate from different sources and include sea salts, fine soil, smoke soot, ash, pollen, dust and disintegrated particles of meteors. These particles are generally concentrated in the lower layers of the atmosphere due to gravity. Higher concentrations of these particles are found in subtropical and temperate regions due to drier winds compared to equatorial and polar regions. **Hence, statement 2 is correct.**

Q.11) Solution (a)

Explanation:

- Humus is dark, organic material that is formed by the decay of organic matter such as dead leaves, plants and animals when decomposed by microorganisms. The accumulation of humus in the soil and its quality depends on many factors, such as climatic conditions, terrain, the quantity and quality of decomposed plant biomass, the chemical composition of the soil, its water-physical properties and its thermal regime. Humus accumulates in cold climates as bacterial growth is slow. With undecomposed organic matter because of low bacterial activity, layers of peat develop in sub-arctic and tundra climates. In humid tropical and equatorial climates, bacterial growth and action is intense and dead vegetation is rapidly oxidised leaving very low humus content in the soil. **Hence, both Statement-I and Statement-II are correct and Statement-II is the correct Explanation for Statement-I.**

Q.12) Solution (a)

Explanation:

- Temperature inversion refers to a meteorological phenomenon in which the atmospheric temperature in the Troposphere increases with increasing altitude in contrast with the usual decrease in temperature with an increasing altitude. A number of factors are responsible for the temperature inversion giving rise to its various types such as:
    - Radiation Inversion: It occurs during clear and calm nights when the Earth's surface rapidly cools by radiating heat into space. The cool surface layer in contact with the ground becomes colder than the air above it, creating a stable layer of warm air aloft. **Hence, both Statement-I and Statement-II are correct and Statement-II is the correct Explanation for Statement-I.**
    - Advection Inversion: It happens when warm air moves horizontally over a cooler surface. For example, warm air flowing over a cold ocean or snow-covered ground can create a temperature inversion.
    - Frontal Inversion: It occurs along the boundaries of air masses with different temperatures. When a warm front of an air mass approaches the cold front of another air mass, then warm air is lifted over the colder air, leading to an inversion layer, etc.
    - A nocturnal temperature inversion, marked by an increase in temperature with increasing height above the earth's surface, often forms on clear, nights with light winds. The inversion forms because air in contact with the cooling ground cools through conduction.

Q.13) Solution (c)

Explanation:

- Net Ecosystem Production (NEP) denotes the net accumulation of organic matter or carbon by an ecosystem. NEP is the difference between the rate of production of living organic matter (NPP) and the decomposition rate of dead organic matter (heterotrophic respiration). **Hence, option c is the correct answer.**
- Gross Primary Production (GPP) denotes the total amount of carbon fixed in the process of photosynthesis by plants in an ecosystem, such as a stand of trees. GPP is measured on photosynthetic tissues, principally leaves.
- Net Primary Production (NPP) denotes the net production of organic matter by plants in an ecosystem that is, GPP reduced by losses resulting from the respiration of the plants (autotrophic respiration).
- Net Biome Production denotes the net production of organic matter in a region containing a range of ecosystems (a biome) and includes, in addition to heterotrophic respiration, other processes leading to loss of living and dead organic matter (harvest, forest clearance and fire, etc.).

Q.14) Solution (c)

Explanation:

- Dugong is currently the only herbivorous marine mammal in the world and it feeds exclusively on seagrass. It is listed as vulnerable in the International Union for Conservation of Nature (IUCN) Red List of Threatened Species. In India, dugongs are found in the Gulf of Mannar, the Gulf of Kutch and the Andaman & Nicobar Islands. **Hence, option 1 is correct.**
- Hangul or Kashmiri stag is a subspecies of Central Asian red deer endemic to Kashmir and surrounding areas. In Kashmir, it is found primarily in the Dachigam National Park where it receives protection. Like other deer, hangul is herbivores, feeding on leaves, flowers and shoots. **Hence, option 2 is correct.**
- Nilgiri tahr is an endangered species and the sole Caprinae species found in the tropical mountains of southern India. They are herbivores. They feed on various grasses, shrubs, leaves and forbs. It is an endangered species listed in Schedule I of the Wildlife (Protection) Act, 1972 and assessed as endangered by the IUCN. **Hence, option 3 is correct.**

Q.15) Solution (d)

Explanation:

- The elements cycle in either a gas cycle or a sedimentary cycle. In a gaseous cycle, elements move through the atmosphere. In a sedimentary cycle, elements move from land to water to sediment. A perfect nutrient cycle is one in which the nutrients are replaced as fast as they are used up. Most gaseous cycles are generally considered perfect. In contrast, sedimentary cycles are considered relatively imperfect, as some nutrients are lost from the cycle into the soil and sediments and become unavailable for immediate cycling i.e., there are more stages in which short-term or long-term stagnation occurs. Carbon cycle, nitrogen cycle and oxygen cycle are examples of the Gaseous cycle whereas the phosphorus cycle, calcium cycle and sulphur cycle are examples of the Sedimentary cycle. **Hence, option d is the correct answer.**

Q.16) Solution (d)

Explanation:

- The six main indicators of water quality are dissolved oxygen, turbidity, bioindicators, nitrates, pH scale and water temperature.
- Water Temperature:
    - Aquatic organisms depend upon specific temperatures and water conditions for their optimal health. The water temperature will also affect other parameters of water quality, such as the dissolved oxygen and vulnerability of organisms to parasites, pollution and disease. **Hence, option 1 is correct.**
- pH scale:
    - It measures the acidic nature of an object. Living organisms can survive only in a narrow range of pH change. Human body works within the pH range of 7.0 to 7.8. When pH of rain water is less than 5.6, it is called acid rain. When acid rain flows into the rivers, it lowers the pH of the river water. The survival of aquatic life in such rivers becomes difficult. **Hence, option 2 is correct.**
- Dissolved Oxygen (DO):
    - The quantity of dissolved oxygen is a key indicator of water quality in streams and lakes. Taking fish as an example, analysis has shown all species and sizes of fish can live if the amount of dissolved oxygen in the water is in the range of 9.5 mg/L to 12 mg/L. Below that level, fewer fish survive; and if it is below 4.0 mg/L, no types of fish can do so. **Hence, option 3 is correct.**
- Turbidity and Total Suspended Solids (TSS):

- It is a measure of how clean water is or its clarity. The measurement of turbidity levels depends upon the concentration of Total Suspended Solids (TSS). TSS are particles larger than 2 microns found in the water, such as gravel, sand, silt, clay and algae. **Hence, option 4 is correct.**

Q.17) Solution (b)

Explanation:

- The gymnosperms are the plants in which ovules are not enclosed by any ovary wall. After fertilisation the seeds remain exposed and therefore these plants are called naked-seeded plants. The gymnosperms produce microspores and megaspores which are produced in microsporangia and megasporangia borne on the sporophylls. The sporophylls – microsporophylls and megasporophylls – are arranged spirally on the axis to form male and female cones, respectively. **Hence, statement 1 is correct.**
- The pollen grain in gymnosperms germinates and pollen tube releases the male gamete into the ovule, where it fuses with the egg cell in archegonia. Following fertilisation, the zygote develops into embryo and the ovules into seeds. Unlike the gymnosperms where the ovules are naked, in the angiosperms or flowering plants, the pollen grains and ovules are developed in specialised structures called flowers. **Hence, statement 2 is correct.**
- In angiosperms, the seeds are enclosed in fruits. The angiosperms are an exceptionally large group of plants occurring in a wide range of habitats. The Angiosperms are divided into two classes: the dicotyledons and the monocotyledons. **Hence, statement 3 is not correct.**

Q.18) Solution (b)

Explanation:

- Mangroves are salt-tolerant plant communities found in tropical and sub-tropical intertidal regions of the world. India has a mangrove forest cover occupying only 3.2% of global mangrove forest. Sundarbans in West Bengal has the largest mangrove cover, occupying 43% and Gujarat has the second largest cover with 23% of the total cover in India. **Hence, statement 1 is not correct and statement 3 is correct.**
- South 24 Parganas district of West Bengal alone accounts for 41.85% mangrove cover of the country. South 24 Parganas holds the Sundarbans National Park, home to one of the largest mangrove forests in the world. **Hence, statement 2 is correct.**

Q.19) Solution (d)

Explanation:

- The Pleistocene epoch is a geologic epoch which began around 2.6 Mya (Million years ago) and came to an end around 11,700 BP (Before Present). It is characterized by lower sea levels than the present epoch and colder temperatures. During much of the Pleistocene, Europe, North America and Siberia were covered by extensive ice sheets and glaciers. The Pleistocene was an important time because it was when the human genus first evolved. **Hence, option d is the correct answer.**

Q.20) Solution (d)

Explanation:

- Fire is a natural phenomenon and nature has evolved with its presence. Many ecosystems benefit from periodic fires, because they clear out dead organic material—and some plant and animal populations require the benefits fire brings to survive and reproduce. **Hence, statement 1 is correct.**
- Moreover, nutrients released from the burned material, which includes dead plants and animals, return more quickly into the soil than if they had slowly decayed over time. In this way, fire increases soil fertility. **Hence, statement 2 is correct.**
- Conversely, fires can help rid an ecosystem of invasive species that have not adapted to regular wildland fires. While animals and plants within fire-prone ecosystems have adapted to thrive within a cycle of wildfires, invasive plants and animals are less likely to recover and could thus be controlled or even eradicated from the ecosystem they invaded. **Hence, statement 3 is correct.**
- Several plants actually require fire to move along their life cycles. For example, seeds from many pine tree species are enclosed in pine cones that are covered in pitch, which must be melted by fire for the seeds to be released. Other trees, plants and flowers, like certain types of lilies, also require fire for seed germination. **Hence, statement 4 is correct.**

Q.21) Solution (a)

Explanation:

- Repo rate is the rate at which the Central Bank of a country (Reserve Bank of India in case of India) lends money to Commercial Banks against government securities in the event of any shortfall of funds. Repo rate is used by monetary authorities to control inflation as this acts as a disincentive for banks to borrow from the Central Bank. **Hence, Statement-I is correct.**

- Increase in repo rate makes borrowing from RBI more expensive for Commercial Banks. This leads to decline in lendable resources of the banks, which then charge high interests for loan borrowings. Since, the borrowing cost has increased, fewer loans are applied for disbursement. This ultimately reduces the money supply in the economy and thus helps in arresting inflation. **Hence, Statement-II is correct and Statement-II is the correct Explanation for Statement-I.**

Q.22) Solution (c)

Explanation:

- The Central Bank fixes the margin requirements and under deflationary conditions the Central Bank reduces the margin requirements to increase the money supply and fuel the growth engines of the economy. **Hence, statement-I is correct.**
- Marginal requirement refers to the difference between market value of the security offered for loans and the amount of loans offered by the commercial banks. When there is excess demand for loans in the market, the Central Bank increases the margin requirement to reduce the credit capacity creation of the Commercial banks. Thus, in times of inflation, the margin requirements are increased and demand for loans are decreased and in deflation, margin requirements are decreased and demand for loans are increased. **Hence, statement-II is incorrect.**

Q.23) Solution (d)

Explanation:

- Capital Output Ratio explains the relationship between the level of investment made in the economy and the consequent increase in GDP. It expresses the relationship between the value of capital invested and the value of output. It is the amount of capital needed to produce one unit of output.
- It is agreed that the capital-output ratio in underdeveloped countries is generally higher, i.e., the capital is less productive in them than in developed countries. This is so because there is a relative inefficiency of the industries which produce capital goods. These industries also lack the new technological advancements that are available with the developed nations. These economies need to achieve a lower capital-output ratio to make efficient use of capital and increase total output in the economy. Thus, underdeveloped and developing economies require lower capital-output ratio for achieving higher growth. **Hence, statement-I is incorrect and statement-II is correct.**

Q.24) Solution (c)

Explanation:

- A liquidity trap is an adverse economic situation that can occur when consumers and investors hoard cash rather than spending or investing, thus rendering the expansionary monetary policy ineffective. It is a situation when expansionary monetary policy (increase in the money supply) does not increase the interest rate or income and hence does not stimulate economic growth. It is the extreme effect of monetary policy. It is a situation in which the general public is prepared to hold on to whatever amount of money is supplied at a given rate of interest. They do so because of the fear of adverse events like deflation and war. **Hence, option c is the correct answer.**

Q.25) Solution (d)

Explanation:

- The money market refers to trading in very short-term debt investments. At the wholesale level, it involves large-volume trades between institutions and traders. It involves overnight swaps of vast amounts of money between banks and the government.
- Banker's Acceptance (BA) is a negotiable piece of paper that functions like a post-dated cheque. A bank, rather than an account holder, guarantees the payment. Also known as bills of exchange, they are used by companies as a relatively safe form of payment for large transactions. **Hence, point 1 is correct.**
- A Certificate of Deposits (CD) is a savings product that earns interest on a lump sum for a fixed period of time. CDs differ from savings accounts because the money must remain untouched for the entirety of their term or risk penalty fees or lost interest. CDs usually have higher interest rates than savings accounts as an incentive for lost liquidity. **Hence, point 2 is correct.**
- A Treasury bill (T-Bill) is a short-term government debt obligation backed by the Treasury Department with a maturity of one year or less. **Hence, point 3 is correct.**
- Commercial Paper is an unsecured, short-term debt instrument issued by corporations. It's typically used to finance short-term liabilities such as payroll, accounts payable and inventories. CP is usually issued at a discount from face value. It reflects prevailing market interest rates. **Hence, point 4 is correct.**

Q.26) Solution (c)

Explanation:

- Marginal Cost of Funds based Lending Rate (MCLR) is the minimum lending rate below which a bank is not permitted to lend. MCLR is a dynamic rate that allows banks to adjust their lending rates based on changes in their cost of funds. When the cost of funds for the bank increases or decreases, the MCLR can be revised accordingly, which impacts the interest rates charged to borrowers. This mechanism ensures that the changes in the borrowing costs are passed on to the borrowers in a more transparent and timely manner. **Hence, option c is the correct answer.**

Q.27) Solution (a)

Explanation:

- Inventory includes finished products and all the assets a business owns or uses to complete production. It refers to the raw materials used in production as well as the goods produced that are available for sale. **Hence, statement 1 is correct.**
- A company's inventory represents one of the most important assets it has because the turnover of inventory represents one of the primary sources of revenue generation and subsequent earnings for the company's shareholders. There are three types of inventory, including raw materials, work-in-progress and finished goods.
- Inventory turnover ratios are only useful for comparing similar companies and are particularly important for retailers. A relatively low inventory turnover ratio may be a sign of weak sales or excess inventory, while a higher ratio signals strong sales but may also indicate inadequate inventory stocking. Inventory is categorised as a current asset on a company's balance sheet. **Hence, statements 2 and 3 are not correct.**

Q.28) Solution (d)

Explanation:

- Non-Banking Financial Companies (NBFCs): These are financial institutions that offer various banking services but do not have a banking licence. Generally, these institutions are not allowed to take traditional demand deposits—readily available funds, such as those in checking or savings accounts— from the public. This limitation keeps them outside the scope of conventional oversight from federal and state financial regulators.
- A Nidhi Company is an NBFC engaged in the business of lending and borrowing with its members or shareholders. It is recognized under section 406 of the Companies Act, 2013 and are regulated by the Ministry of Corporate Affairs. **Hence, point 1 is correct.**

- Chit fund companies operate chit fund schemes with registration under the relevant Chit Fund Act. Operating a chit fund usually involves floating of a chit fund scheme, finding potential members, enrolling members into a chit, collecting contributions, conducting chit auctions, distributing funds and maintaining books. Chit fund companies earn a fixed amount of the members' contribution to operating the chit fund scheme. It is a part of NBFC architecture. **Hence, point 2 is correct.**
- MUDRA Bank was registered as a Company in 2015 under the Companies Act 2013 and as a NBFC with the RBI. Housing Finance Company such as National Housing Bank (NHB) is an NBFC that is principally indulged in the business of constructing houses and financing acquisition that includes the improving of plots from the building of new houses. **Hence, points 3 and 4 are correct.**

Q.29) Solution (a)

Explanation:

- Statutory Liquidity Ratio (SLR): It is the minimum percentage of deposits that the commercial bank maintains through gold, cash and Government securities. However, these deposits are maintained by the banks themselves and not with the Reserve Bank of India (RBI). **Hence, points 1 and 2 are correct.**
- Corporate bonds are debt instruments issued by corporations to raise funds and are not typically included under SLR. While they may have their own level of liquidity, they are not part of the specified liquid assets mandated for SLR purposes. **Hence, point 3 is not correct.**
- Loans and advances made by banks to borrowers are not considered as liquid assets under SLR. They represent the bank's exposure to credit risk and are not easily convertible into cash. **Hence, point 4 is not correct.**
- Equity shares representing ownership in a company are not included under SLR. They are considered as long-term investments and are subject to market fluctuations. **Hence, point 5 is not correct.**

Q.30) Solution (c)

Explanation:

- Stock variable refers to a quantity of a commodity measured at a point of time. In macroeconomics, money supply, unemployment level, foreign exchange reserves, capital etc. are examples of stock variables. **Hence, points 1, 2 and 4 are correct.**
- Flow variable: It is measured over a period of time. National Income, imports, exports, consumption, production, Investment, expenditure etc. are examples of flow variables. **Hence, point 3 is not correct.**

Q.31) Solution (d)

Explanation:

- Under the Rules of Rajya Sabha, the Chairman of Rajya Sabha nominates from amongst the members a panel of Vice-Chairpersons. Any one of them can preside over the House in the absence of the Chairman or the Deputy Chairman. He has the same powers as the Chairman when so presiding. He holds office until a new panel of vice chairpersons is nominated. When a member of the panel of vice-chairpersons is also not present, any other person as determined by the House acts as the Chairman. **Hence, option d is the correct answer.**

Q.32) Solution (a)

Explanation:

- Article 74 provides for a Council of Ministers with the Prime Minister at the head to aid and advise the President in the exercise of his functions. The 42nd and 44th Constitutional Amendment Acts have made the advice binding on the President. Further, the nature of advice tendered by Ministers to the President cannot be enquired by any court. This provision emphasizes the intimate and the confidential relationship between the President and the Ministers.
- In 1971, the Supreme Court held that 'even after the dissolution of the Lok Sabha, the Council of Ministers does not cease to hold office. Article 74 is mandatory and, therefore, the President cannot exercise the executive power without the aid and advice of the Council of Ministers. Any exercise of executive power without the aid and advice will be unconstitutional as being violative of Article 74'. Again in 1974, the court held that 'wherever the Constitution requires the satisfaction of the President, the satisfaction is not the personal satisfaction of the President but it is the satisfaction of the Council of Ministers with whose aid and on whose advice the President exercises his powers and functions'. **Hence, both Statement-I and Statement-II are correct and Statement-II is the correct Explanation for Statement-I.**

Q.33) Solution (d)

Explanation:

- The Indian Parliament is not a sovereign body in the sense in which the British Parliament is. Unlike the British Parliament, the authority and jurisdiction of the Indian Parliament are defined, limited and restrained. The sovereignty of the Parliament is legally restricted by the written character of the Constitution, the federal system of government, the system of judicial review and the Fundamental Rights. **Hence, option d is the correct answer.**

Q.34) Solution (b)

Explanation:

- Before entering upon his office, the President of India has to make and subscribe to an oath or affirmation. In his oath, the President swears:
    - to faithfully execute the office;
    - to preserve, protect and defend the Constitution and the law;
    - to devote himself to the service and well-being of the people of India.
- The oath of office to the President is administered by the Chief Justice of India and in his absence, the senior most judge of the Supreme Court available. **Hence, option b is the correct answer.**

Q.35) Solution (c)

Explanation:

- The Public Accounts Committee was set up first in 1921 under the provisions of the Government of India Act of 1919 and has since been in existence. At present, it consists of 22 members (15 from the Lok Sabha and 7 from the Rajya Sabha). **Hence, statement 1 is correct.**
- The members are elected by the Parliament every year from amongst its members. The members are elected according to the principle of proportional representation by means of the single transferable vote. Thus, all parties get due representation in it. **Hence, statement 2 is not correct.**
- The term of office of the members is one year. A minister cannot be elected as a member of the committee. The chairman of the committee is appointed from amongst its members by the Speaker. Until 1966 - '67, the chairman of the committee belonged to the ruling party. However, since 1967 a convention has developed whereby the chairman of the committee is selected invariably from the Opposition. **Hence, statement 3 is correct.**
- The committee is not vested with the power of disallowance of expenditures by the departments. The committee is not an executive body and hence, cannot issue an order. Only the Parliament can take a final decision on its findings. Its recommendations are advisory and not binding on the ministries. **Hence, statement 4 is correct.**

Q.36) Solution (b)

Explanation:

- As per Article 105 (2) of the Constitution of India, no Member of Parliament (MP) shall be liable to any proceedings in any court in respect of anything said or any vote given by him in Parliament or any committee thereof. **Hence, statement 1 is correct.**
- MPs cannot be arrested during the session of Parliament and 40 days before the beginning and 40 days after the end of a session. This privilege is available only in civil cases and not in criminal cases or preventive detention cases. **Hence, statement 2 is not correct.**
- The Committees of Privileges consist of 15 members in Lok Sabha (10 in the case of Rajya Sabha) nominated by the Speaker (Chairman in the case of Rajya Sabha). In the Rajya Sabha, the deputy chairperson heads the committee of privileges. The committee examines every question involving a breach of privilege of the House or of the members or of any Committee thereof referred to it by the House or by the Speaker/Chairman. **Hence, statement 3 is correct.**

Q.37) Solution (a)

Explanation:

- Each standing committee consists of 31 members (21 from Lok Sabha and 10 from Rajya Sabha). The members of the Lok Sabha are nominated by the Speaker from amongst its own members, just as the members of the Rajya Sabha are nominated by the Chairman from amongst its members. **Hence, statement 1 is not correct.**
- The term of office of each standing committee is one year from the date of its constitution. A minister is not eligible to be nominated as a member of any of the standing committees. In case a member, after his nomination to any of the standing committees, is appointed a minister, he then ceases to be a member of the committee. **Hence, statement 2 is correct.**
- One of the functions of each of the standing committees is to consider the demands for grants of the concerned ministries/departments before they are discussed and voted in the Lok Sabha. But its report should not suggest anything of the nature of cut motions. **Hence, statement 3 is not correct.**

Q.38) Solution (c)

Explanation:

- Nitrogen exists as two nitrogen atoms joined by a very strong triple covalent bond. The process of conversion of nitrogen (N2) to ammonia is termed as nitrogen fixation. The nitrogen-fixing microbes could be free-living or symbiotic. Examples of free-living nitrogen-fixing aerobic microbes are Azotobacter and Beijernickia while Rhodospirillum is anaerobic and Bacillus free living. In addition, a number of cyanobacteria such as Anabaena and Nostoc are also free-living nitrogen fixers.
- Lightning can also fix nitrogen. The high temperature of a lightning bolt can break the bonds of atmospheric nitrogen molecules. Free nitrogen atoms in the air bond with oxygen in the air to create nitrogen oxides, which dissolve in moisture to form nitrates that are carried to Earth's surface by precipitation. **Hence, statement 1 is correct.**
- Eukaryotes do not possess the enzyme nitrogenase which is required for nitrogen fixation. Hence, nitrogen fixation is carried out by prokaryotes and not by eukaryotes. **Hence, statement 2 is correct.**
- Molybdenum (Mo) is involved in nitrogen fixation and nitrate assimilation. It is an essential trace element in plants; in legumes as a catalyst it assists bacteria in fixing nitrogen. **Hence, statement 3 is correct.**
- Nitrate present in the soil is also reduced to nitrogen by the process of denitrification. Denitrification is carried by the bacteria Pseudomonas and Thiobacillus. **Hence, statement 4 is not correct.**

Q.39) Solution (b)

Explanation:

- The Prime Minister is the leader of the Lower House. In this capacity, he enjoys the following powers:
    - He advises the President with regard to summoning and proroguing of the sessions of the Parliament.
    - He can recommend dissolution of the Lok Sabha to the President at any time. **Hence, statement 1 is correct.**
    - He announces government policies on the floor of the House.
- The Prime Minister of India enjoys the following powers as head of the Union Council of Ministers:
    - He recommends persons who can be appointed as Ministers by the President.

- He allocates and reshuffles various portfolios among the Ministers. **Hence, statement 2 is correct.**
- He can ask a minister to resign or advise the President to dismiss him in case of a difference of opinion.
- He presides over the meeting of the Council of Ministers and influences its decisions.
- He guides, directs, controls and coordinates the activities of all the Ministers.
- He can bring about the collapse of the Council of Ministers by resigning from office.

- The Cabinet Secretariat functions directly under the Prime Minister. The administrative head of the Secretariat is the Cabinet Secretary who is also the ex-officio Chairman of the Civil Services Board. The business allocated to the Cabinet Secretariat under the Government of India (Allocation of Business) Rules, 1961 includes:
  - Secretarial assistance to the Cabinet and Cabinet Committees; and
  - Rules of Business. **Hence, statement 3 is not correct.**

Q.40) Solution (c)

Explanation:

- The constitutional position of the Governor differs from that of the President in the following two respects:
  - While the Constitution envisages the possibility of the Governor acting at times in her/his discretion, no such possibility has been envisaged for the President. The President has no constitutional discretion but has some situational discretion in case of appointment of the Prime Minister in case of no clear majority in the Lok Sabha. **Hence, statement-I is correct.**
  - After the 42nd Constitutional Amendment Act (1976), ministerial advice has been made binding on the President, but no such provision has been made with respect to the Governor. **Hence, statement-II is incorrect.**

Q.41) Solution (a)

Explanation:

- Gautama Buddha, who founded Buddhist philosophy, was born in 563 BC at Lumbini, a village near Kapilavastu in the foothills of Nepal. At the age of 35 on the same day of his birth, he attained enlightenment (Nirvana) under that pipal tree and became Buddha, the Enlightened One. According to Buddha, the Middle Path (Madhyam Marg)

or Middle Way describes the character of the Noble Eightfold Path that leads to liberation. The Eightfold Path consists of the right view, right resolve, right speech, right conduct, right livelihood, right effort, right mindfulness. **Hence, option a is the correct answer.**

Q.42) Solution (c)

Explanation:

- The Mahajanapadas were ancient kingdoms and republics that emerged from the Janapadas in the sixth century BC in the Indian subcontinent. There existed 16 Mahajanapadas, which had capital cities and were heavily fortified. E.g. Avanti, Ujjain, Gandhara, Magadha, Kuru, etc. As the rulers of the Mahajanapadas built huge forts and maintained big armies, they needed more resources. So, they started collecting the following taxes regularly:
    - The most people on whom the tax was imposed were farmers. Farmers paid taxes called Bali and Bhaga. Bali was a tax imposed on the size of the land, while Bhaga was the tax imposed on agricultural produce, which was fixed at 1/6th of the total agricultural production. **Hence, statement 1 is correct.**
    - Craftspersons paid taxes in the form of labour and hunters-gatherers had to provide forest produce to the king as a kind of tax. **Hence, statement 2 is correct.**
    - The Kshatriyas and Brahmanas were exempted from paying taxes in most of the Mahajanapadas. **Hence, statement 3 is correct.**

Q.43) Solution (d)

Explanation:

- In ancient Indian society, the caste system played a significant role, dividing society into various social classes. The term 'hinajah means outcastes' during the Mauryan Empire referred to those individuals who were considered outside the four-fold varna system or who belonged to the lowest castes. The social and economic position of outcastes was worse than that of slaves as well as hired labourers. These outcastes or hinajah were considered impure because of the nature of their occupations such as hide- cleaning, tanning, etc. This was the main reason for their ostracism. **Hence, option d is the correct answer.**

Q.44) Solution (d)

Explanation:

- Konark Sun Temple: It was constructed in the 13th century CE under the patronage of King Narasimhadeva I of the Eastern Ganga dynasty. It is located on the eastern coast of India in Puri, Odisha. It was declared a UNESCO World Heritage Site in 1984. The temple is dedicated to the Sun God, also known as Surya. The temple is in the shape of a colossal chariot, with carved wheels and galloping horses. The temple's architecture is an excellent example of the Kalinga style of architecture. It is also known as the 'Black Pagoda' because of its dark colour and was used as a navigational landmark by ancient sailors to Odisha. **Hence, option d is the correct answer.**

Q.45) Solution (b)

Explanation:

- The Rashtrakuta Dynasty ruled parts of South India from the eighth to the tenth centuries CE. In the Rashtrakuta kingdom, the directly administered areas were divided into: Rashtra (province), Visaya and Bhukti. The head of a Rashtra was called Rashtrapati (governor), who sometimes enjoyed the status and title of a vassal king. The Visaya was like a modern district under Visayapati, and the Bhukti was a smaller unit than it. **Hence, statement 1 is not correct.**
- An interesting way of proclaiming the subordination of feudatory and defeated rulers was to install their portrait images as dvarapalakas in temples in the capital city. For example, Govinda III introduced two statues of the lord of Lanka like pillars of victory in adorning the portals of a Shiva temple in Manyakheta. **Hence, statement 2 is correct.**
- The dominant castes followed their traditional duties such as Brahmanas were devoted to religious rituals and teaching and Kshatriyas were engaged in administration and war. The Vaishyas had degenerated to the status of Shudras due to the decline in commerce and engagement in agricultural activities. Simultaneously, the position of the Shudras improved considerably due to the expansion of agriculture and enlistment in the army. **Hence, statement 3 is correct.**

Q.46) Solution (b)

Explanation:

- The Doctrine of Trimurti is mentioned in the Maitrayaniya Upanishad, which is incorporated into the Yajurveda. In the Muktika canon, it is also referred to as the Maitri Upanishad. **Hence, pair 1 is correctly matched.**

- "Vasudhaiva Kutumbakam" is drawn from the ancient Sanskrit text of the Maha Upanishad. It emphasizes the interconnectedness and unity of all people and nations, promoting a sense of global harmony, cooperation, and shared responsibility for the well-being of the planet and its inhabitants. **Hence, pair 2 is not correctly matched.**
- "Atithi Devo Bhava" is a Sanskrit phrase which means "The guest is God". The mantras are from the Taittiriya Upanishad. **Hence, pair 3 is correctly matched.**

Q.47) Solution (b)

Explanation:

- The Khilji dynasty, which ruled from 1290 - 1320, marked the end of Turkish nobility from positions of power in the Delhi Sultanate. The Khilji dynasty was of Afghan origin, not Turkish, and their rise to power marked a significant shift in the ruling elite of the Delhi Sultanate. Under the Khiljis, power was no longer concentrated in the hands of the Turkish nobility, but rather in the hands of the Afghan Khilji rulers. It was known for its military expansion and administrative reforms. They pursued an aggressive foreign policy, conquering territories in northern and central India, and also attempted expeditions into southern India. Therefore, it was the Khilji dynasty that brought an end to the dominance of the Turkish nobility and ushered in a period of Afghan rule in the Delhi Sultanate. **Hence, option b is the correct answer.**

Q.48) Solution (c)

Explanation:

- During the medieval period, many Sanskrit works were translated into Persian. The integration process continued in the music field under Feroze Shah Tughlaq. During his reign, the Indian classical work 'Ragadarpan' was translated into Persian. **Hence, option c is the correct answer.**

Q.49) Solution (b)

Explanation:

- The 'Chehra' and 'Dagh' systems were introduced by Alauddin Khilji. He established a huge permanent, standing army to satisfy his ambition of conquest and to protect the territory from Mongol invasion. For this, he introduced many reforms in the military department. The cash payment to the soldiers was made from the royal treasury in order to strengthen his control over the army. In order to ensure maximum efficiency, a strict review of the army from time to time was carried out by regular muster of the armed forces. The system of dagh (branding of horses) was introduced so that soldiers won't bring horses of poor quality to the muster. A descriptive roll of each soldier

similar to an identity card called huliya and chehra was also maintained such that one soldier won't replace another and enemy soldiers won't infiltrate into the army. **Hence, option b is the correct answer.**

Q.50) Solution (a)

Explanation:

- During Swadeshi Movement, the leadership was provided by men like Surendranath Banerjea, K.K. Mitra and Prithwishchandra Ray. The methods adopted were petitions to the government, public meetings, memoranda and propaganda through pamphlets and newspapers such as Hitabadi, Sanjibani and Bengalee. Their objective was to exert sufficient pressure on the government through an educated public opinion in India and England to prevent the unjust partition of Bengal (1905) from being implemented. **Hence, option a is the correct answer.**

Q.51) Solution (a)

Explanation:

- Har Ghar Lakhpati Scheme is a pre-calculated recurring deposit scheme designed to help customers to accumulate Rs 1 lakh or multiples thereof. The new scheme simplifies the process of achieving financial goals, allowing customers to plan and save effectively. **Hence, statement 1 is correct.**
- This product is also available to minors, encouraging early financial planning and savings habits. The minimum tenure of recurring deposits is 12 months (one year), and the maximum is 120 months (10 years). **Hence, statements 2 and 3 are not correct.**

Q.52) Solution (d)

Explanation:

- Ayushman Bharat PM-JAY is the largest health assurance scheme in the world which aims at providing a health cover of Rs. 5 lakhs per family per year for secondary and tertiary care hospitalization to over 12 crores poor and vulnerable families (approximately 55 crore beneficiaries) that form the bottom 40% of the Indian population. **Hence, statement 1 is not correct**
- The households included are based on the deprivation and occupational criteria of Socio-Economic Caste Census 2011 (SECC 2011) for rural and urban areas respectively. PM-JAY was earlier known as the National Health Protection Scheme (NHPS) before being rechristened. **Hence, statement 2 is not correct.**

- The funding for the scheme is shared- 60:40 for all states and UTs with their own legislature, 90:10 in Northeast states and Jammu and Kashmir, Himachal and Uttarakhand and 100% Central funding for UTs without legislature. **Hence, statement 3 is not correct.**

Q.53) Solution (a)

Explanation:

- Xenotransplantation is any procedure that involves the transplantation, implantation or infusion into a human recipient of either live cells, tissues, or organs from a non-human animal source, or human body fluids, cells, tissues or organs that have had ex-vivo contact with live nonhuman animal cells, tissues or organs. **Hence, statement 1 is correct.**
- Xenotransplantation involving the heart was first tried in humans in the 1980s. A well known case was that of an American baby, Stephanie Fae Beauclair, better known as Baby Fae. He was born with a congenital heart defect. He received a baboon heart in 1984. **Hence, statement 2 is not correct.**

Q.54) Solution (b)

Explanation:

- Liquid nano urea is a revolutionary agri-input that provides nitrogen to plants. It is sprayed directly on the leaves and gets absorbed by the plant. Fertilisers in nano form provide a targeted supply of nutrients to crops, as they are absorbed by the stomata. It is recommended for application only as a foliar spray at critical growth stages of crops. **Hence, statement 1 is not correct.**
- Liquid nano urea has a shelf life of a year. It is not likely to undergo 'caking' when it comes in contact with moisture. While conventional urea has an efficiency of about 25 per cent, the efficiency of liquid nano urea can be as high as 85-90 per cent. Conventional urea fails to have the desired impact on crops as it is often applied incorrectly and the nitrogen in it is vaporised or lost as gas. A lot of nitrogen is also washed away during irrigation. **Hence, statement 2 is correct.**
- Urea is a chemical nitrogen fertiliser, white in colour, which artificially provides nitrogen, a major nutrient required by plants. Liquid Nano Urea is a patented and indigenously made liquid that contains nanoparticles of urea. The Indian Farmers Fertiliser Cooperative Limited (IFFCO) has developed and patented nano urea liquid technology. **Hence, statement 3 is correct.**

Q.55) Solution (a)

Explanation:

- Thorium (chemical symbol Th) is a naturally occurring radioactive metal found at trace levels in soil, rocks, water, plants and animals. There are natural and man-made forms of thorium, all of which are radioactive. In general, naturally occurring thorium exists as Th-232, Th-230 or Th-228. It does not mutate into uranium-233 straightaway; it first turns into an isotope of an element known as protactinium. The isotope, protactinium-233, turns into uranium-233. **Hence, statement 1 is not correct.**
- Unlike uranium, thorium alone cannot be directly used as nuclear fuel in a reactor. It is fertile rather than fissile, and can only be used as a fuel in conjunction with a fissile material such as recycled plutonium. **Hence, statement 2 is correct.**
- Till 2014, the Atomic Minerals Directorate for Exploration and Research (AMD), a constituent unit of the Department of Atomic Energy (DAE), had established 11.93 million tonnes of in situ resources of Monazite (Thorium bearing mineral) in the country, which contains about 1.07 million tonnes of thorium. **Hence, statement 3 is not correct.**

Q.56) Solution (c)

Explanation:

- Robotic Process Automation (RPA) is a software technology that makes it easy to build, deploy, and manage software robots that emulate human actions interacting with digital systems and software. RPA is divided into three different sections - chatbots, knowbots, and probots.
    - Probots – process the data by following simple, repeatable rules. **Hence, pair 1 is correctly matched.**
    - Knowbots – the bots that search for information on the internet and store the user-specified needs. **Hence, pair 2 is correctly matched.**
    - Chatbots – the virtual support system that responds to the users or customers queries when asked. **Hence, pair 3 is correctly matched.**

Q.57) Solution (c)

Explanation:

- Harimau Shakti is a joint military exercise involving troops of India and Malaysia. It aims to enhance interoperability in the planning and execution of various operations in the jungle terrain. The exercise is an annual training event between the Indian Army and

the Malaysian Army that has been held since 2012. **Hence, option c is the correct answer.**

Q.58) Solution (c)

Explanation:

- Internet of Things refers to the collective network of connected devices and the technology that facilitates communication between devices and the cloud, as well as between the devices themselves. **Hence, statement 1 is correct.**
- Edge computing is a distributed computing framework that brings enterprise applications closer to data sources such as IoT devices or local edge servers. This proximity to data at its source can deliver strong business benefits, including faster insights, improved response times and better bandwidth availability. **Hence, statement 2 is correct.**

Q.59) Solution (a)

Explanation:

- Defence Research and Development Organisation (DRDO) successfully flight-tested Solid Fuel Ducted Ramjet (SFDR) booster at the Integrated Test Range (ITR), Chandipur off the coast of Odisha. The SFDR-based propulsion enables the missile to intercept aerial threats at very long range at supersonic speeds. **Hence, Statement 3 is not correct.**
- Complimenting the teams involved in design, development and testing, Secretary, Department of Defence R&D and Chairman DRDO Dr G Satheesh Reddy said, with the successful trial of SFDR, the range of air-to-air missiles can be enhanced. It was developed with the aim of developing the critical technologies which are required in the propulsion systems of future long-range air-to-air missiles of India. **Hence, Statement 1 is not correct.**
- It is a form of air-breathing jet engine that uses the engine's forward motion to compress incoming air without an axial compressor or a centrifugal compressor. A ramjet-powered vehicle requires an assisted take-off like a rocket assist to accelerate it to a speed where it begins to produce thrust. Ramjets work most efficiently at supersonic speeds around Mach 3 (three times the speed of sound) and can operate up to speeds of Mach 6. **Hence, Statement 2 is correct.**

Q.60) Solution (b)

Explanation:

- ISpA aspires to be the collective voice of the Indian Space industry. ISpA will be represented by leading domestic and global corporations that have advanced capabilities in space and satellite technologies. ISpA aims to foster growth in India's space missions and industry by facilitating collaborations between the public and private sectors. Comprising leading Indian and international corporations with advanced space technology capabilities, ISpA's membership enhances its expertise and reach. **Hence, statement 2 is correct.**
- The association will actively engage with stakeholders to develop policies conducive to the Government's vision, promoting an enabling environment for the space sector. One of the main goals of the organisation is to supplement the government's efforts towards making India a global leader in commercial space-based excursions. **Hence, statement 1 is correct.**
- ISpA seeks to forge global partnerships to attract investments and technologies, fostering innovation, job creation, and advancing India's space industry. It is a voluntary association of leading space industries in India. It does not come under the Department of Space headed by the Prime Minister of India. **Hence, statement 3 is not correct.**

Q.61) Solution (d)

Explanation:

- Caspian Sea is the world's largest inland body of water. It lies to the east of the Caucasus Mountains and to the west of the vast steppe of Central Asia. The sea's name derives from the ancient Kaspi peoples, who once lived in Transcaucasia to the west. It is bordered by five countries: Kazakhstan, Turkmenistan, Iran, Azerbaijan, and Russia. **Hence, option d is the correct answer.**

Q.62) Solution (d)

Explanation:

- Tillite (also called diamictite and mixtite) is made up of sediment that was carried or deposited by a glacier and later cemented to form rock. It consists of a fairly fine-grained matrix that contains pebble to larger size pieces of distinctive rock types. Most tillite erratics have a dark green, gray, or grayish brown matrix that contains lighter-colored, fairly angular granite pebbles. **Hence, option d is the correct answer.**

Q.63) Solution (a)

Explanation:

- The inner planets (Mercury, Venus, Earth and Mars) are primarily composed of rocky materials, while the outer planets (Jupiter, Saturn, Uranus and Neptune) are predominantly composed of gases. **Hence, statement-I is correct.**
- The temperature of the early solar system explains why the inner planets are rocky and the outer ones are gaseous. In the inner solar system, only substances with very high melting points would have remained solid from the heat of the Sun. All the rest would have vaoprized. So, the inner solar system objects are made of iron, silicon, magnesium, sulphur, aluminium, calcium and nickel. Many of these were present in compounds with oxygen. There were relatively few elements of any other kind in a solid state to form the inner planets. **Hence, statement-II is correct and Statement-II is the correct Explanation for Statement-I.**

Q.64) Solution (d)

Explanation:

- The gravitational force (g) on our planet refers to the acceleration due to gravity experienced by objects on or near the Earth's surface. The standard value of gravitational acceleration is approximately 9.8 m/s^2. However, the gravitational force is not constant everywhere on Earth and varies from equator to pole. The gravitational force (g) on our planet is greater near the poles and less at the equator. Therefore, objects weigh slightly less at the equator than at the poles. **Hence, statement-I is incorrect.**
- This variation in gravitational force is due to the Earth's rotation and its oblate shape. The Earth is not a perfect sphere but is slightly flattened at the poles and bulging at the equator due to its rotation. Thus, the distance from the earth's center to the equator is greater than that at the poles. This shape, known as an oblate spheroid, leads to a centrifugal force at the equator, which counteracts the gravitational force to some extent. **Hence, statement-II is correct.**

Q.65) Solution (a)

Explanation:

- The massive mid-ocean ridge system is a continuous range of underwater volcanoes that wraps around the globe like seams on a baseball, stretching nearly 65,000 kilometers (40,390 miles) and with more than 90 percent of the mountain range lying underwater, in the deep ocean with an average water depth to the top of the ridge of 2,500 meters (8,200 feet). **Hence, statement 1 is correct.**

- Mid-ocean ridges occur along divergent plate boundaries, where a new ocean floor is created as the Earth's tectonic plates spread apart. As the plates separate, the molten rock rises to the seafloor, producing enormous volcanic eruptions of basalt. The speed of spreading affects the shape of a ridge – slower spreading rates result in steep, irregular topography while faster-spreading rates produce much wider profiles and more gentle slopes. **Hence, statement 2 is not correct.**

Q.66) Solution (b)

Explanation:

- Block mountains are formed by the process of faulting, where large blocks of rock are uplifted or displaced along faults in the Earth's crust. When the earth's crust bends, folding occurs, but when it cracks, faulting takes place. Faulting may be caused by tension or compression, forces that lengthen or shorten the earth's crust, causing a section of it to subside or to rise above the surrounding level. **Hence, statement 1 is correct.**
- Fold mountains often have long, linear shapes with parallel ridges and valleys. They exhibit folded rock layers and are usually found in chains or ranges. Block mountains are characterized by sharp, rugged terrain with steep cliffs and scarps. **Hence, statement 2 is not correct.**
- The Himalayas, the Alps and the Andes are examples of prominent fold mountain ranges. Hunsruck Mountains, the Vosges and the Black Forest of the Rhineland are examples of prominent block mountain ranges. **Hence, statement 3 is correct.**

Q.67) Solution (b)

Explanation:

- As per Biological Diversity Act, 2002, every local body shall constitute a Biodiversity Management Committee (BMC) within its area for the purpose of promoting conservation, sustainable use and documentation of biological diversity including preservation of habitats, conservation of land races, folk varieties and cultivars, domesticated stocks and breeds of animals and microorganisms and chronicling of knowledge relating to biological diversity. The main function of the BMC is to prepare the People's Biodiversity Register in consultation with local people. **Hence, option b is the correct answer.**

Q.68) Solution (b)

Explanation:

- The key difference between igneous rocks and metamorphic rocks is that igneous rocks are the oldest rocks on Earth, while metamorphic rocks are derivatives of igneous rocks and sedimentary rocks. **Hence, statement 1 is correct.**
- When a rock is exposed to extreme heat and pressure within the Earth but does not melt, the rock becomes metamorphosed. Metamorphism can change the mineral composition and the texture of the rock. Thus, a metamorphic rock can be a new mineral composition and/or texture. **Hence, statement 2 is not correct.**
- Metamorphic rocks are harder than the igneous rocks. Resistance to weathering and erosion is less in metamorphic rocks compared to igneous rocks. Also, the tendency to react with acids is higher in metamorphic rocks when compared to igneous rocks. **Hence, statement 3 is correct.**

Q.69) Solution (d)

Explanation:

- Quasars are a subclass of Active Galactic Nuclei (AGNs), extremely luminous galactic cores where gas and dust falling into a supermassive black hole emit electromagnetic radiation across the entire electromagnetic spectrum. Simply put, quasars are the blazing centers of active galaxies and are powered by a supermassive black hole feeding on humongous quantities of gas. Quasars are amongst the most luminous objects in the known Universe, typically emitting thousands of times more light than the entire Milky Way. **Hence, option d is the correct answer.**

Q.70) Solution (c)

Explanation:

- A "stationary limit" is a surface around the outside of a rotating black hole. Any object which passes through this surface is always in motion, it is pulled by the distortion of space caused by the rotating black hole. **Hence, option c is the correct answer.**

Q.71) Solution (a)

Explanation:

- Buying and selling of Government Securities (G-Secs) by the Reserve Bank of India (RBI), on behalf of the Government, through Commercial Banks is known as Open

Market Operations (OMO). Under this, RBI does not directly deal with the public. **Hence, statement 1 is correct.**

- RBI conducts open market operations to regulate the supply of money that is on reserve in Indian banks. The RBI purchases Government securities to increase the money supply and sells them to reduce it. **Hence, statement 2 is not correct.**

Q.72) Solution (b)

Explanation:

- Tax elasticity refers to changes in tax revenue in response to changes in tax rate. For example, how tax revenue changes if the government reduces corporate income tax from 30 per cent to 25 per cent indicates tax elasticity. **Hence, statement 1 is not correct.**
- Tax buoyancy explains this relationship between the changes in government's tax revenue growth and the changes in Gross Domestic Product (GDP). It refers to the responsiveness of tax revenue growth to changes in GDP. When a tax is buoyant, its revenue increases without increasing the tax rate. **Hence, statement 2 is correct.**

Q.73) Solution (b)

Explanation:

- The Global Financial Stability Report is released by the International Monetary Fund (IMF). It provides an assessment of the global financial system and markets and addresses emerging market financing in a global context. It focuses on current market conditions, highlighting systemic issues that could pose a risk to financial stability and sustained market access by emerging market borrowers. **Hence, option b is the correct answer.**

Q.74) Solution (b)

Explanation:

- The Ways and Means Advances (WMA) is a facility for both the Centre and States to borrow from the Reserve Bank of India (RBI). These borrowings are meant purely to help them to tide over temporary mismatches in cash flows of their receipts and expenditures. The Government can avail of immediate cash from the RBI, if required. But it has to return the amount within 90 days. Interest is charged at the existing repo rate. **Hence, statements 1 and 3 are correct.**
- The interest rate on WMA is the RBI's repo rate, which is basically the rate at which it lends short-term money to banks. The Governments are, however, allowed to draw

amounts in excess of their WMA limits. The interest on such overdraft is 2 percentage points above the repo rate. Further, no State can run an overdraft with the RBI for more than a certain period. **Hence, statement 2 is not correct.**

Q.75) Solution (a)

Explanation:

- The Gini index measures the area between the Lorenz curve and a hypothetical line of absolute equality, expressed as a percentage of the maximum area under the line. A Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality.
- It is an important tool for analysing income or wealth distribution within a country or region. Furthermore, it is possible for the Gini coefficient of a developing country to rise (due to increasing inequality of income) while the number of people in absolute poverty decreases. This is because the Gini coefficient measures relative, not absolute, wealth. **Hence, both Statement-I and Statement-II are correct and Statement-II is the correct Explanation for Statement-I.**

Q.76) Solution (c)

Explanation:

- A typical lake has three distinct zones of biological communities linked to its physical structure. The littoral zone is the near shore area where sunlight penetrates all the way to the sediment and allows aquatic plants (macrophytes) to grow. The limnetic (pelagic) zone is the open water area where light does not penetrate to the bottom. **Hence, statement-II is incorrect.**
- The third component of the lake habitat is the benthic zone (the bottom of the lake), covered by fine layers of mud in which animals live. In the littoral zone, there is enough light for rooted plants to grow, but beyond this zone, there are no rooted plants as the water is too deep for light to reach them. **Hence, statement-I is correct.**

Q.77) Solution (c)

Explanation:

- The Constitution of India requires the previous sanction or recommendation of the President for introducing legislation on some matters. These matters are:
    - A Bill for the formation of new States or the alteration of boundaries, etc., of existing States [Article 3]. **Hence, option 1 is correct.**

- A Money Bill [Article 110]. **Hence, option 2 is correct.**
- A Bill which would involve expenditure from the Consolidated Fund of India even though it may not, strictly speaking, be a Money Bill [Art. 117 (3)].
- State Bills imposing restrictions upon the freedom of trade (Art. 304).

- As per Article 274 of the Constitution of India, no Bill or amendment which imposes or varies any tax or duty in which States are interested, or which varies the meaning of the expression agricultural income as defined for the purposes of the enactments relating to Indian income tax, or which affects the principles on which under any of the foregoing distributable to State, or which imposes any surcharge for the purposes of the Union as is mentioned in the foregoing provisions of this Chapter, shall be introduced or moved in either House or Parliament except on the recommendation of the President. **Hence, option 3 is correct.**

Q.78) Solution (d)

Explanation:

- The Djibouti Code of Conduct (DCOC)/ Jeddah Amendment (JA) was established in January 2009 and is aimed at the repression of piracy and armed robbery against ships in the Western Indian Ocean Region, the Gulf of Aden and the Red Sea. It was established under the International Maritime Organization (IMO). **Hence, option d is the correct answer.**

Q.79) Solution (a)

Explanation:

- Multi-cropping or mixed cropping is the simultaneous cultivation of two or more crops in a year. It is used, wherein two or more crops are grown simultaneously without a definite row pattern. **Hence, statement 1 is correct.**
- Mixed farming is a kind of cultivating that includes both the harvesting of crops and raising animals. It carried across Asia and nations like India, Afghanistan, South Africa, Malaysia, Indonesia, China, Canada, Central Europe and Russia. **Hence, statement 2 is not correct.**

Q.80) Solution (c)

Explanation:

- The manner of election of the President and the Vice-President is the same. Thus, the Vice-President's election, like that of the President's election, is held in accordance

with the system of proportional representation by means of the single transferable vote and the voting is by secret ballot. **Hence, statement 1 is correct.**

- All doubts and disputes in connection with election of the Vice- President are inquired into and decided by the Supreme Court whose decision is final. **Hence, statement 2 is not correct.**
- The election of a person as Vice-President cannot be challenged on the ground that the electoral college was incomplete (i.e., existence of any vacancy among the members of the electoral college). **Hence, statement 3 is correct.**
- If the election of a person as Vice-President is declared void by the Supreme Court, acts done by him before the date of such declaration of the Supreme Court are not invalidated (i.e., they continue to remain in force). **Hence, statement 4 is correct.**

Q.81) Solution (a)

Explanation:

- Varada Mudra indicates charity, compassion or granting wishes. The right arm is extended in a natural position all the way down, with the palm of the open hand facing outwards towards onlookers. If standing, the arm is held slightly extended to the front. It can be a left-hand gesture as well. Through the five extended fingers, this Mudra signifies five perfections: Generosity, Morality, Patience, Effort and Meditative Concentration. **Hence, option a is the correct answer.**

Q.82) Solution (a)

Explanation:

- Tawang Monastery is located in the Tawang district in Arunachal Pradesh, it is the largest monastery in India. It is also the second biggest and oldest in Asia and is known as the Tawang Ganden Namgyal Lhatse. **Hence, pair 1 is not correctly matched.**
- Nagapattinam served as an important Buddhist centre during the Pallava and Medieval Chola period. Many Chinese Buddhists came to Nagapattinam for trading and they needed a place to pray. As a result of this they constructed a Buddhist temple which later came to be called "China Pagoda". This temple was built during the reign of Pallava king Narasimha-Varma II. **Hence, pair 2 is not correctly matched.**
- Bharhut is located in Madhya Pradesh and it is famous for its 22 centuries old ruins of a Buddhist stupa. Discovered in the late 19th century, Bharhut Stupa ruins carry many signs of the great Mauryan and Shunga empire. The ruins represent the aniconic phase of Buddhist art. Buddha had been represented in the form of symbols. The Buddhist stupa had four gates (Torana). But, only one gate survived and was found from the

excavation. The stone gate is still in good condition, preserved and exhibited at the Indian Museum of Kolkata. **Hence, pair 3 is correctly matched.**

Q.83) Solution (c)

Explanation:

- The Kuka Movement marked the first major reaction of the people in the Punjab to the new political order initiated by the British after 1849. This movement was founded in 1840 by Bhagat Jawahar Mal (also called Sian Saheb) in western Punjab. It was a religio-political movement that emerged among the Sikhs in Punjab in the mid-nineteenth century. It aimed at restoring the purity and socio-religious originality of Sikhism, which had been corrupted by the influence of Hinduism, Islam and British rule.
- A major leader of the movement after Bhagat Jawahar Mal was Baba Ram Singh. (He founded the Namdhari Sikh sect.) After the British took Punjab, the movement got transformed from a religious purification campaign to a political campaign. Its basic tenets were the abolition of caste and similar discriminations among Sikhs, discouraging the consumption of meat and alcohol and drugs, permission for intermarriages, widow remarriage and encouraging women to step out of seclusion. The movement was also inspired by anti-colonial sentiments and the desire to overthrow the British and revive Sikh sovereignty. **Hence, statements 1 and 2 are correct.**

Q.84) Solution (a)

Explanation:

- Alipore conspiracy case: It was a trial in British India which charged the revolutionaries associated with the Anushilan Samiti for the bomb attack on Kingsford (the District Judge of Muzaffarpur) in 1908, in Muzaffarpur, Bihar. **Hence, statement 1 is correct.**
- In 1908, Prafulla Chaki and Khudiram Bose threw a bomb at a carriage supposed to be carrying an English judge, Kingsford, in Muzaffarpur. Kingsford was not in the carriage and unfortunately, two British ladies, instead, got killed. Prafulla Chaki shot himself dead while Khudiram Bose was tried and hanged. Sachin Sanyal and Jogesh Chandra were not associated with it. **Hence, statement 2 is not correct.**

Q.85) Solution (d)

Explanation:

- In 2006, the Supreme Court pronounced the Prakash Singh judgment on police reforms, which among other things, spoke about the selection and minimum tenure of the Director Generals of Police (DGPs). It said that the DGP of a State shall be selected by the State Government from the three senior-most officers empanelled by the Union Public Service Commission (UPSC) for the post. **Hence, statement-I is incorrect.**
- However, after this judgment, several States passed laws or executive orders to circumvent the empanelment process of the UPSC. The State laws appointed in-house committees to form a panel of senior IPS officers of the State cadre and allowed the State Government to pick a DGP from this panel, instead of involving the UPSC. According to the States, since 'police' and 'public order' are State subjects, the DGP appointment should exclusively be in the State's domain. **Hence, statement-II is correct.**

Q.86) Solution (d)

Explanation:

- Sterilization refers to the actions taken by the Central Bank to neutralise the impact of its foreign exchange operations on the domestic money supply. The purpose of sterilization is to maintain monetary stability and prevent excessive liquidity or inflationary pressures resulting from foreign exchange operations. **Hence, statement 1 is incorrect.**
- The Central Bank sells Government Securities (G-Secs) to Commercial Banks or other market participants as part of its sterilization operations. By selling these securities, the Central Bank absorbs funds from the market, reducing the money supply. Thus, the purpose of selling G-Secs in sterilization is not to boost liquidity in the economy but rather to absorb excess liquidity from the market. **Hence, statement 2 is correct.**

Q.87) Solution (a)

Explanation:

- The GDP price deflator is an economic indicator that measures the average price changes of all goods and services produced within an economy over a specific period. It is used to calculate the Real GDP (Gross Domestic Product), which is GDP adjusted for inflation.
- The GDP Price deflator and the Consumer Price Index (CPI) are both inflation measures, but they have different scopes. The GDP price deflator includes all goods

and services produced in an economy, not just those in a fixed basket. In contrast, the CPI measures the price changes of a fixed basket of goods and services typically consumed by households. In contrast, Therefore, the GDP price deflator provides a broader measure of overall price changes in the economy. **Hence, both Statement-I and Statement-II are correct and Statement-II is the correct Explanation for Statement-I.**

Q.88) Solution (a)

Explanation:

- A proportional tax is a type of income tax system that levies the same percentage tax to everyone regardless of income. The proportional income tax, thus, acts as an automatic stabiliser, a shock absorber because it makes disposable income and thus consumer spending, less sensitive to fluctuations in GDP.
    - When GDP rises, the disposable income also rises but by less than the rise in GDP because a part of it is siphoned off as taxes. This helps limit the upward fluctuation in consumption spending.
    - During a recession when GDP falls, disposable income falls less sharply and consumption does not drop as much as it otherwise would have fallen had the tax liability been fixed. This reduces the fall in aggregate demand and stabilises the economy. **Hence, both Statement-I and Statement-II are correct and Statement-II is the correct Explanation for Statement-I.**

Q.89) Solution (d)

Explanation:

- The highest level of decision-making elements like Chief Executive Officer (CEOs) of firms are a part of the Tertiary sector. The tertiary sector comprises companies that provide services, such as retailers, entertainment firms and financial organisations. The tertiary sector provides services to businesses and consumers by selling the goods that are manufactured by companies in the secondary sector. The types of services provided by the tertiary sector include: Retail sales, transportation and distribution, restaurants, tourism, insurance and banking, healthcare services, legal services. **Hence, statement 1 is not correct.**
- The formal sector consists of jobs that have specific working hours and fixed wages; whereas, the informal sector is where the workers or employees don't have fixed working hours and wages. The formal sector comprises businesses and economic activities that are under the supervision of the government. The informal sector consists of workers and enterprises that do not come under the direct regulation of the government. **Hence, statement 2 is not correct.**

Q.90) Solution (c)

Context:

- India is committed to the Sendai Framework for disaster risk reduction, the Prime Minister's Principal Secretary said recently, while calling for increased international collaboration to enhance disaster resilience. In this context, a question can be asked by UPSC about the framework.

Explanation:

- The Sendai Framework for Disaster Risk Reduction 2015-2030 was the first major agreement of the post-2015 development agenda and provides member states with concrete actions to protect development gains from the risk of disaster. **Hence, statement 1 is correct.**
- It was adopted by the UN member states at the Third UN World Conference on Disaster Risk Reduction in Sendai, Japan, on March 18, 2015. It is the successor instrument to the Hyogo Framework for Action (HFA) 2005-2015. **Hence, statement 2 is correct.**
- It recognizes that the State has the primary role to reduce disaster risk, but that responsibility should be shared with other stakeholders, including local government, the private sector, and other stakeholders. **Hence, statement 3 is correct.**

Q.91) Solution (b)

Context:

- Recently, the organisers of the Thadou Convention held in Assam's Guwahati event released a 10-point declaration to protect the Thadou tribe's distinct identity and heritage amid the ethnic crisis in Manipur. In this context, the tribe becomes important from the perspective of UPSC.

Explanation:

- The people belonging to Thadou tribe live in the hill country adjacent to the Imphal Valley in the northeastern Indian state of Manipur. They speak Chin and Thado which belong to the Tibeto-Burman family of the Sino-Tibetan languages. They are also known by other names such as Chillya, Kuki, Kukihin, Teizang and Theruvan. **Hence, statement 1 is not correct.**
- They practice subsistence activities include animal domestication, cultivation, hunting, and fishing. Jhum (slash-and-burn) agriculture is predominant. The village chief's house is usually the largest dwelling within the village. Outside it there is a platform upon which men gather to discuss matters of importance and to mediate disputes. **Hence, statement 2 is correct.**

- The god Pathen is believed by the Thadou to have created everything. He is also believed to be the ruler of the universe. Sacrifice is offered to Pathen for health or assistance in time of trouble. The Hun-Thadou cultural festival is an annual celebration of this community which is celebrated at the arrival of the New Year. **Hence, statement 3 is correct.**

Q.92) Solution (a)

Explanation:

- PUShP portal: A High Price Day Ahead Market (HP-DAM) and Surplus Power Portal (PUShP) was launched by the Ministry of Power. It aims to ensure greater availability of power during the peak demand season at a price higher than the ceiling of Rs 12 per unit by a certain category of sellers. The power distribution companies (DISCOMs) will be able to indicate their surplus power in block times / days / months on the portal. **Hence, pair 1 is not correctly matched.**
- MASI Portal: Monitoring App for Seamless Inspection (MASI) was developed for synchronous monitoring of the Child Care Institutions (CCIs) and their inspection mechanism across the country. The National Commission for Protection of Child Rights (NCPCR) has developed this application. It serves as a single platform for inspections of all the CCIs across the country by any of the above stated authorities. Regular follow-up is done before and after the completion of the cycle of inspection. The complete reports are automatically generated on the Portal as soon as the questionnaire is filled and submitted by the authority. **Hence, pair 2 is not correctly matched.**
- PM-DAKSH Portal: Ministry of Social Justice & Empowerment launched 'PM-DAKSH' Portal and 'PM DAKSH' Mobile App to make the skill development schemes accessible to the target groups - SC (Scheduled Caste), OBC (Other Backward Classes), Economically Backward Classes (EBC), Denotified tribes, Sanitation workers. **Hence, pair 3 is correctly matched.**

Q.93) Solution (a)

Explanation:

- Transnistria, the tiny breakaway region of Moldova, was in the news during the Russia Ukraine war because of reports of a series of explosions in its territory. The de facto state lies between Moldova to its west and Ukraine towards its east. **Hence, pair 1 is not correctly matched.**
- Ziguinchor is a river-port town in southwestern Senegal, lying along the Casamance River. Recently, in Senegal, there were clashes between police and Sonko supporters. The violence occurred mainly in the capital, Dakar, and the city of Ziguinchor in the south. **Hence, pair 2 is not correctly matched.**

- Khartoum, is the capital of Sudan, just south of the confluence of the Blue and White Nile rivers. It has bridge connections with its sister towns, Khartoum North and Omdurman, with which it forms Sudan's largest conurbation. The Sudanese army conducted air strikes in the capital city of Khartoum, targeting paramilitary forces from the Rapid Support Forces (RSF). **Hence, pair 3 is correctly matched.**

Q.94) Solution (b)

Context:

- According to a statement by the US Department of State, it will partner with the India Semiconductor Mission, Ministry of Electronics and IT, Government of India to explore opportunities to grow and diversify the global semiconductor ecosystem under the International Technology Security and Innovation (ITSI) Fund, created by the CHIPS Act of 2022. In this context, India Semiconductor Mission becomes important for UPSC.

Explanation:

- The India Semiconductor Mission is a comprehensive program for the development of sustainable semiconductor and display ecosystem in the country. It aims to provide financial support to companies investing in semiconductors, display manufacturing and design ecosystem. **Hence, statement 1 is correct.**
- The India Semiconductor Mission was launched in 2021 with a total financial outlay of Rs. 76,000 crores under the aegis of the Ministry of Electronics and IT (MeitY). It has been setup as an Independent Business Division within Digital India Corporation having administrative and financial autonomy to formulate and drive India's long-term strategies for developing semiconductors and display manufacturing facilities and semiconductor design ecosystem. **Hence, statement 2 is not correct.**
- Semiconductors are materials which have a conductivity between conductors (generally metals) and non-conductors or insulators (such as ceramics). These are employed in the manufacture of various kinds of electronic devices, including diodes, transistors, and integrated circuits. Germanium and silicon are the most common examples of semiconductors. **Hence, statement 3 is correct.**

Q.95) Solution (b)

Explanation:

- Port of Vukovar, in the eastern Croatian town of Vukovar, is the only Croatian river port on the Danube. It was developed during the twentieth century. It is one of the largest ports in Central Europe and the largest river port of the former Socialist Federal Republic of Yugoslavia. **Hence, pair 1 is correctly matched.**

- Izmail Port is a multidisciplinary port located in the waters of the Kiliia River estuary of the Danube. It is an important transport hub of Ukraine. **Hence, pair 2 is correctly matched.**
- Reni Port is a port located on the left bank of the Danube River. It is an important transport hub of Ukraine, where the work of river, sea, road, and rail transport is closely intertwined. **Hence, pair 3 is not correctly matched.**
- Port of Constanta is located in Constanta, Romania, on the western coast of the Black Sea, 332 km from the Bosphorus Strait and 157 km from the Sulina Branch, through which the Danube River flows into the sea. **Hence, pair 4 is not correctly matched.**

Q.96) Solution (d)

Context:

- People belonging to the Birhor tribe, a PVTG in Jharkhand, have joined a movement against child marriage in Giridih for the first time, according to an organisation working in the field of protection of children's rights. In this context, criteria for identifying PVTGs can be asked by UPSC.

Explanation:

- PVTGs are a more vulnerable group among tribal groups in India. Moreover, they are largely dependent on hunting for food and a pre-agriculture level of technology. Currently, there are 2.8 million PVTGs belonging to 75 tribes across 22,544 villages in 220 districts across 18 states and Union Territories in India. The criteria for identifying Particularly Vulnerable Tribal Groups include :-
    - Pre-agricultural level of technology
    - Low level of literacy
    - Economic backwardness
    - A declining or stagnant population. **Hence, option d is the correct answer.**

Q.97) Solution (b)

Explanation:

- Kemer region is situated in Turkey's Antalya province. It was in the news recently due to wildfires. The fires spread fast through woodland in the area as a result of strong winds and low humidity. **Hence, pair 1 is correctly matched.**
- Maui Island is located in Hawaii, United States of America (USA). Recently, it was in the news for wildfires. As per initial reports, the changing land-use patterns in Hawaii, which has seen farm and forest lands being replaced by flammable non-native species

of grasses like Guinea grass, were a likely cause for the easy spread of the fire. **Hence, pair 2 is correctly matched.**

- Canary Island is an archipelago located in the Atlantic Ocean. It is located towards the south of mainland Spain and west of Morocco on the African coast. Recently, more than 30 migrants were feared dead after a small boat headed for Spain's Canary Islands sank. **Hence, pair 3 is not correctly matched.**

Q.98) Solution (c)

Context:

- Sammy Basso, who was the longest living survivor of the rare genetic disease progeria, recently died at the age of 28. So, the basic details about the disease becomes important for UPSC.

Explanation:

- Progeria, also known as Hutchinson-Gilford progeria syndrome, is an extremely rare, progressive genetic disorder. It causes children to age rapidly. It is reported to occur in 1 in 4 million newborns worldwide. Newborns with the disorder appear to be healthy at birth but usually start to show signs of premature aging during their first one to two years of life. **Hence, option c is the correct answer.**

Q.99) Solution (c)

Context:

- Recently, the BharatGen initiative was launched by the Union Ministry of Science & Technology. In this context, details about the initiative becomes important from the perspective of UPSC.

Explanation:

- BharatGen is an initiative which will create generative AI systems that can generate high-quality text and multimodal content in various Indian languages. It aims to make generative AI available to citizens in different Indian languages. **Hence, statement 1 is correct.**

- It is the world's first State-funded project of its kind. It is designed to process and generate multiple modalities, including text, images, and sometimes audio and video. These models are trained on large datasets containing text and image data, allowing them to learn the relationships between different modalities. **Hence, statement 2 is correct.**

- Spearheaded by IIT Bombay under the National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS), the initiative will create generative AI systems that can

generate high-quality text and multimodal content in various Indian languages. **Hence, statement 3 is correct.**

Q.100) Solution (c)

Context:

- The increased focus of Global Digital Compact (GDC) on digital trust and security is referred as the key to the future of internet. In the context of its recently held meeting, the GDC becomes an important topic for UPSC.

Explanation:

- The Global Digital Compact is part of the Pact for the Future, which will be discussed and adopted at the UN Summit of the Future in September 2024. The objective of this compact is to ensure that digital technologies are used responsibly and for the benefit of all, while addressing the digital divide and fostering a safe and inclusive digital environment. **Hence, statement 1 is correct.**
- The GDC aims to build a collaborative multi-stakeholder framework that strives to address the digital divide, advance the Sustainable Development Goals (SDGs), and create a secure and inclusive digital environment. It also seeks to strengthen the international governance of emerging technologies, including AI, to ensure that they align with fundamental rights and values. **Hence, statement 2 is correct.**