

GS Test – 3 (7th February 2021)**Answer Key & Explanation****Q1. Answer: c**

Explanation: A wetland is a land area saturated with water, either permanently or seasonally, and it takes on the characteristics of a distinct ecosystem.

Beas Conservation Reserve of Punjab has been declared as a Ramsar site recently. The Beas Conservation Reserve is a 185-kilometre stretch of the Beas River located primarily in the north-west of the State of Punjab. It was declared as a conservation reserve under the Wildlife Protection Act, 1972. It is for the first time that any river has been accorded such a status. Beas River is home to the **Indus** River Dolphin which is 'Endangered' according to IUCN. **Thus, statement (1) is correct.** Beas river ecosystem faced major threats like- fragmentation due to dams, barrages and canals; sand mining; over-fishing (commercial fishing is banned at present). Because of all these pressures, Indus River Dolphin was thought to have disappeared from the river. But, it was spotted again in 2007. Today, the Beas is the only Indian habitat of the functionally blind mammal, which uses echolocation to navigate underwater and hunt for food. In 2018, **Critically Endangered gharials** were also introduced into the river.

Nawabganj Bird Sanctuary- This wetland was added to the Ramsar List in January 2020. It's a shallow marshland. It hosts endangered Egyptian vulture. It is threatened by invasive water hyacinth. **So, (2) is correct.**

Therefore, the correct answer is c.

Q2. Answer: d**Explanation:**

Khangchendzonga Biosphere Reserve –

The Khangchendzonga Biosphere Reserve has become the 11th Biosphere Reserve from India included in the UNESCO designated World Network of Biosphere Reserves (WNBR).

The decision to include Khangchendzonga Biosphere Reserve in WNBR was taken at the 30th Session of International Coordinating Council (ICC) of Man and Biosphere (MAB) Programme of UNESCO held at Palembang, Indonesia.

India has 18 Biosphere Reserves, and with the inclusion of Khangchendzonga, the number of internationally designated WNBR has become 11, with 7 Biosphere Reserves being domestic Biosphere Reserves.

Khangchendzonga Biosphere Reserve in Sikkim is one of the world's highest ecosystems, reaching elevations of 1, 222 meters above sea level. It includes a range of eco lines, varying from sub-tropic to the Arctic, and natural forests in different biomes that support a vibrant diversity of forest types and habitat. The core area of the Biosphere Reserve is a significant trans-boundary Wildlife Protected Area.

The southern and central landscape, which makes up 86% of the core area, is situated in the Greater Himalayas. The northern part of the area accounting for 14% is characterized by trans-Himalayan features. Buffer zones are being developed to promote eco-tourism activities. Plantation and soil conservation work is also being carried out.

The core zone – Khangchendzonga National Park was designated a World Heritage Site in 2016 under the 'mixed' category. Many of the mountains, peaks, lakes, caves, rocks, stupas (shrines) and hot springs function as pilgrimage sites. Over 118 species of the large number of medicinal plants found in Dzongu Valley in north Sikkim are of ethnomedical utility. The transition zone is targeted for eco-development activities, afforestation, plantation of medicinal herbs and soil conservation measures.

Therefore, the correct answer is d.

Q3. Answer: d

Explanation: India has achieved the target of doubling the tiger count four years ahead of the deadline of 2022. This is by far the biggest increase in tiger count in terms of both numbers and percentage since the four-yearly census (and not quinquennial i.e. after every five years) using camera traps and the capture-mark-recapture method begun in 2006. **So, statement (1) is not correct.**

Around 40% of India's estimated 2,226 tigers (2014 census) live outside the core areas of tiger habitats. These tigers are vulnerable to poaching and come into conflict with humans.

Top Performers: Madhya Pradesh saw the highest number of tigers (526) followed by Karnataka (524) and Uttarakhand (442). **So, statement (2) is not correct.**

There are 4 States (M.P., Karnataka, Uttarakhand and Maharashtra) with more than 300 tigers. Buxa, Dampa and Palamau Tiger Reserves do not have a single tiger now. **So, statement (3) is not correct.**

No tigers were found in Mizoram state.

Tiger Reserves:

Madhya Pradesh's Pench Sanctuary and Kerala's Periyar Sanctuary emerged as the best-managed tiger reserves in the country.

Sathyamangalam Tiger Reserve in Tamil Nadu registered the "maximum improvement" since 2014.

The Dampa and Rajaji reserves, in Mizoram and Uttarakhand respectively are at the bottom of the list in terms of Tiger count. No tiger has been found in the Buxa (West Bengal), Palamau (Jharkhand) and Dampa (Mizoram) reserves.

Therefore, the correct answer is d.

Q4. Answer: a

Explanation: As per the report analysis by Greenpeace India and the Centre for Research on Energy and Clean Air (CREA):

- India's Sulphur dioxide (SO₂) emissions have recorded a significant decline of approximately 6% in 2019 as compared to 2018 for the first time in the last four years. **So, statement (1) is correct.**
- India still occupies the top emitter's position for the fifth consecutive year followed by Russia and China. **So, statement (2) is correct.**
- India emitted 21% of global anthropogenic (human-made) SO₂ emissions — or about 5,953 kilotons a year, mostly from coal-fired power plants that lack pollution-curbing equipment. **So, statement (3) is not correct.**
- As per the report, the biggest emission hotspots in India, are thermal power stations (or clusters of power stations) at Singrauli, Neyveli, Sipat, Mundra, Korba, Bonda, Tamnar, Talcher, Jharsuguda, Kutch, Surat, Chennai, Ramagundam, Chandrapur, Visakhapatnam and Koradi.
- The data on sulphur emissions was sourced from the NASA Ozone Monitoring Instrument (OMI), a satellite-based device that has been monitoring air quality from space since 2004. The device provides the geographical location and rates of emissions for hotspots for each calendar year.

Therefore, Option a is correct.

Q5. Answer: c

Explanation: Fly ash consists primarily of oxides of silicon, aluminium, iron and calcium. Magnesium, potassium, sodium, titanium, and sulphur are also present to a lesser degree. **So, statement (1) is correct.**

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Cement can be replaced by fly ash up to 35% and not completely reducing the cost of construction. Using fly ash in concrete is environmentally beneficial because it reduces the Portland cement (a major contributor of CO₂) required in concrete. The fly ash bricks are light in weight and offer high strength and durability.

Longer Setting Times – Fly ash admixtures can lengthen the time it takes for concrete to set. Sometimes this is desirable, particularly in hot weather which speeds up concrete set times, but at other times it is an inconvenience and can cause construction delays. Other admixtures may be necessary to adjust the concrete's set time, depending on the percent fly ash in the mixture and the outside temperature. **So, statement (2) is not correct.**

Fly ash can increase the crop yield and also enhances the water-holding capacity. **So, statement (3) is correct.**

Therefore, the correct answer is c.

Q6. Answer: b

Explanation: National Ambient Air Quality Standards are the standards for ambient air quality set by the Central Pollution Control Board (CPCB) that is applicable nationwide. The CPCB has been conferred this power by the Air (Prevention and Control of Pollution) Act, 1981.

Government of India has laid down National Ambient Air Quality Standards (NAAQS) for twelve air pollutants, namely, PM₁₀, PM_{2.5}, Carbon Monoxide (CO), Sulphur dioxide (SO₂), Nitrogen Dioxide (NO₂), Ammonia (NH₃), ground-level Ozone (O₃), Lead, Arsenic, Nickel, Benzene and Benzo-Pyrene. Carbon-dioxide is not included in the list.

Therefore, the correct answer is b.

Q7. Answer: b

Explanation: Food chain represents the sequence of living organisms which feed on one other. It starts with producers and ends with top consumers.

As one moves from producer across trophic levels, there is a constant decrease in energy as only a specific portion of the energy goes to the next trophic level and rest is lost. So, the pyramid of energy is always upright as the energy available at the producer level is maximum and at top consumer it is minimum. **So, statement (1) is not correct.**

Non-biodegradable compounds aren't digested. They accumulate within the animals that ingest them and become more and more concentrated as they pass along the food chain as animals eat and are eaten in turn. This is bio-magnification, and it means that higher-level predators build up greater and more dangerous amounts of toxic materials than animals lower on the food chain.

So, statement (2) is correct.

Therefore, the correct answer is b.

Q8. Answer: b

Explanation: Schedule 5 - Vermin (Can be hunted). **So, Pair (2) is not correctly matched.**

The Wildlife Protection Act (WPA), 1972 consists of 6 schedule lists, which give varying degrees of protection. Poaching, smuggling and illegal trade of animals listed in Schedule 1 to Schedule 4 are prohibited.

Animals listed in Schedule 1 and Part II of Schedule 2 have absolute protection offences under these and are prescribed the highest penalties. **So, Pair (1) is correctly matched.**

Schedule 3 and Schedule 4 - Animals listed in Schedule 3 and Schedule 4 are also protected, but the penalties are lower compared to Schedule 1 and Part 2 of Schedule 2. **So, Pair (3) is correctly matched.**

Schedule 5 - Animals listed in Schedule 5 are called "vermin" which can be hunted. Mice, rat, common crow and flying fox (fruit-eating bats) are the list of animals in Schedule 5 (i.e. vermin).

Schedule 6 - Cultivation, Collection, extraction, trade, etc. of plants and its derivatives listed in Schedule 6 are prohibited.

Therefore, the correct answer is b.

Q9. Answer: c

Explanation: An inversion, also known as a temperature inversion, is a deviation from the normal change of an atmospheric property with altitude. Normally, air temperature decreases with an increase in altitude. During an inversion, warmer air is held above cooler air; the normal temperature profile with altitude is inverted. An inversion traps air pollution, such as smog, close to the ground. **So, statement (1) is correct.**

Photochemical Smog is formed when sunlight acts on nitrogen oxides and hydrocarbons from automobiles. When activated by sunlight, the compound undergoes a chemical reaction that produces gases called oxidants. **So, statement (2) is correct.**

Atmospheric oxidant production:



Therefore, the correct answer is c.

Q10. Answer: a

Explanation: National Park is an area, whether within a Sanctuary or not, notified by the State government to be constituted as a National Park, by reason of its ecological, faunal, floral, geomorphological, or zoological association or importance, needed to protect and propagate or developing wildlife therein or its environment. No human activity is permitted inside the National Park except for the ones permitted by the Chief Wildlife Warden of the state concerned.

Wildlife Sanctuary is any area, other than area comprised with any reserve forest or the territorial waters, notified by the State Government to constitute as a sanctuary, if such area is of adequate ecological, faunal, floral, geomorphological, natural, or zoological significance, to protect, propagate or develop wildlife or its environment.

Both National Parks (NP) and Wildlife Sanctuaries (WLS) come under the category called "Protected Areas" as declared under the Wildlife (Protection) Act, 1972. The Wildlife Protection Act 1972 defines five types of protected areas viz. National Parks, Wildlife Sanctuaries, Community Reserves, Conservation Reserves, and Tiger Reserves.

So, statement (1) is correct.

A Wildlife Sanctuary is created to protect a single species whereas National Parks are created for an area as National Parks follow an area-based approach. **So, statement (2) is not correct.**

National Parks and Wildlife Sanctuaries, both are established under The Wildlife Protection Act 1972. **So, statement (3) is not correct.**

Therefore, the correct answer is a.

Q11. Answer: b

Explanation: An ecosystem is a single unit which sustains life on Earth. **So, statement (1) is correct.**

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The tendency of an ecosystem to maintain its state of stable equilibrium is called homeostasis.

So, statement (2) is correct.

Ability to evolve as per changing environment is the characteristic feature of a specie. The process is called speciation. **So, statement (3) is not correct.**

Therefore, the correct answer is b.

Q12. Answer: c

Explanation: An important characteristic of all communities is that their composition and structure constantly change in response to changing environmental conditions. This change is orderly and parallel with changes in the physical environment. These changes lead finally to a community near equilibrium with the environment and is called the climax community. This gradual and fairly predictable change in species composition of a given area is called ecological succession. During succession, some species colonise an area and their population becomes more numerous, whereas the population of other species declines and even disappears.

Two different types of succession—primary and secondary—have been distinguished. Primary succession occurs in essentially lifeless areas—regions in which the soil is incapable of sustaining life as a result of such factors as lava flows, newly formed sand dunes, or rocks left from a retreating glacier. *Secondary succession* occurs in areas where a community that previously existed has been removed; it is typified by smaller-scale disturbances that do not eliminate all life and nutrients from the environment. **So, statement (1) is not correct.**

NPP of an ecosystem is always less than the GPP irrespective of the successional stage of the ecosystem. This is because some amount of energy will always be consumed during respiration by the autotrophs. $NPP = GPP - \text{respiration losses}$. **So, statement (2) is not correct.**

In later successional stages, the climax community is about to be reached shortly. The biodiversity is abundant as compared to earlier stages and a lot of energy is needed to maintain the biomass. So, NPP is very less than GPP and the rate of growth also slows down. **So, statement (3) is correct.**

Therefore, the correct answer is c.

Q13. Answer: c

Explanation: In India, the leopard is mentioned under the Schedule-I of Wildlife Protection Act, 1972. **So, statement (1) is correct.**

In the Himalayas, leopards and snow leopards are sympatric with each other as they co-occur within the region up to an altitude of 5,200 m (17,100 ft.). They both hunt Himalayan tahr and musk deer, but the leopard usually prefers forested habitats located at lower altitudes than the snow leopard. **So, statement (3) is correct.**

It is highly adaptable and can survive in a vast range of habitats. It can survive in a range of area from Gangetic plains to Northeastern region and from the Western Ghats to the Eastern Ghats. .

So, statement (3) is correct.

Therefore, the correct answer is c.

Q14. Answer: d

Explanation: Indian State of Forest Report (ISFR) is a biennial publication of Forest Survey of India (FSI), an organization under the Ministry of Environment Forest and Climate Change. The ISFR assesses the forest and tree cover, bamboo resources, carbon stock and forest fires. ISFR 2019 is the 16th report in the series. The 2019 report for the first time has assessed the qualitative nature of the forest cover, including listing its biodiversity and the type of plants and trees found. It also created a *national forest inventory for the first time* on produce from forests. **So, statement (1) is not correct.**

Forest Cover (Area-wise): Madhya Pradesh> Arunachal Pradesh> Chhattisgarh> Odisha> Maharashtra. **So, statement (3) is correct.**

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Forest Cover (Percentage): Mizoram (85.4%)> Arunachal Pradesh (79.63%)> Meghalaya (76.33%)> Manipur (75.46%) > Nagaland (75.31%). In the present assessment, the total forest and tree cover of the country is 80.73 million hectare which is 24.56 percent of the geographical area of the country. As compared to the assessment of 2017, there is an increase of 5,188 sq. km in the total forest and tree cover of the country. **So, statement (2) is not correct.**

Some other findings:

The Mangrove ecosystems are unique and rich in biodiversity and they provide numerous ecological services. Mangrove cover has been separately reported in the ISFR 2019 and the total mangrove cover in the country is 4,975 sq km. An increase of 54 sq Km in mangrove cover has been observed as compared to the previous assessment of 2017. Top three states showing mangrove cover increase are Gujarat (37 sq km) followed by Maharashtra (16 sq km) and Odisha (8 sq km).

Therefore, the correct answer is d.

Q15. Answer: b

Explanation: According to this, a wetland is a land area that is saturated with water, either permanently or seasonally, and it takes on the characteristics of a distinct ecosystem. **So, statement (1) is correct.**

The rules prohibit setting up new or expanding existing industries and disposal of construction and demolition waste within the wetlands. The new rules also prohibit activities like conversion of wetland for non-wetland uses, setting up industries, waste dumping, and discharge of untreated wastes and effluents. **So, statement (2) is correct.**

The new rules stipulate setting up a State Wetlands Authority in each State and union territories headed by the State's environment minister and include a range of government officials. These authorities will need to develop a comprehensive list of activities to be regulated and permitted within the notified wetlands and their zone of influence, recommend additional prohibited activities for specific wetlands, define strategies for conservation and wise use of wetlands, and undertake measures for enhancing awareness within stakeholders and local communities on values and functions of wetlands. **So, statement (3) is not correct.**

Therefore, the correct answer is b.

Q16. Answer: a

Explanation: Arsenic contamination due to geogenic sources in groundwater is a major challenge in the states of West Bengal, Bihar, Chhattisgarh, Uttar Pradesh and Assam. **So, statement (1) is correct.**

According to the latest report of the Central Ground Water Board (CGWB), 21 states across the country have pockets with arsenic levels higher than the Bureau of Indian Standards' (BIS) stipulated permissible limit of 0.01 milligram per litre (mg/l).

As per the World Health Organisation's provisional guideline value for arsenic in drinking water is 0.01 mg/l. **So, statement (2) is not correct.**

Long-term arsenic contaminated water intake leads to arsenic poisoning or arsenicosis, with cancer of skin, bladder, kidney or lung or diseases of the skin (colour changes, and hard patches on palms and soles), or blood vessels of legs and feet.

Therefore, the correct answer is a.

Q17. Answer: a

Explanation:

Speciation

- Speciation is a process within evolution that leads to the formation of new, distinct species that are reproductively isolated from one another. **So, statement (1) is correct.**

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- It involves the splitting of a single evolutionary lineage into two or more genetically independent lineages.
- New species form by two major mechanisms, namely *sympatric speciation* and *allopatric speciation*.

Allopatric Speciation

- The physical isolation of the biology population due to the extrinsic barrier is called allopatric speciation.
- Allopatric speciation occurs when a population of organisms becomes separated or isolated from their main group due to geographical barriers. **So, statement (2) is not correct.**
- Over time, the new groups of homogenous individuals become subjective to changes via natural selection due to pressure from differences in predators, climate, competitors and resources. Populations can become isolated for a variety of reasons.

Sympatric Speciation

- The evolution of new species from one ancestral species by living in the same habitat is called sympatric speciation.
- This type of speciation happens in a population without geographic isolation.
- The main mechanisms resulting in sympatric speciation involve changes in the chromosomes of the organism. One way this happens is when there is a serious error that occurs during cell division resulting in more than one copy of a chromosome(s), or the loss of a chromosome(s), in one of the daughter cells. This condition is known as aneuploidy. **So, statement (3) is not correct.**

Therefore, the correct answer is a.

Q18. Answer: b

Explanation:

	List – I		List – II
1	Biological Extinction	C	Species no longer found anywhere on earth.
2	Local Extinction	E	Species no longer found in an area it once inhabited.
3	Functional Extinction	A	A Species, so few in number that it no longer plays its normal role in the community.
4	Background Extinction	B	Continuous process of natural and low level extinction.
5	Mass Extinction	D	More than 65% of all species become extinct.

Extinction of Species

- A known species has gone extinct if no member of the species is found anywhere on Earth. This is known as biological extinction and is irreversible.
- Before a species goes biologically extinct, it goes through two other stages:
 - Local Extinction: Species is no longer found in the area it once inhabited, though it is present elsewhere in the world.
 - Ecological Extinction: So few members of the species are left that it can no longer play its normal ecological role in the community.
- Background Extinction is a process of natural and low-level extinction that goes on continuously due to changes in the environmental conditions; such changes may be small or big, gradual or sudden. When such changes occur, the local species must adapt itself, move to a more favourable area or become extinct.
- The background extinction has always been happening and biologists say that 99.9% of all species that ever lived are extinct.
- The rate of background extinction has generally been uniform over long geological periods. At some points in time, however, mass extinction have occurred on earth.
- A mass extinction is a global, catastrophic event with more than 65% of all species becoming extinct.

Therefore, the correct answer is b.

Q19. Answer: b

Explanation: Seaweeds are (thalloid plants) macroscopic algae, which mean they have no differentiation of true tissues such as roots, stems and leaves. They have leaf-like appendages.

So, statement (1) is not correct.

Seaweeds, the larger and visible marine plants are found attached to rocks, corals, and other submerged strata in the sea's intertidal and shallow sub tidal zones. **So, statement (2) is correct.** Products like agar-agar and alginates, iodine which are of commercial value, are extracted from seaweeds. **So, statement (3) is correct.**

Functions of seaweeds

- Food for the marine organisms.
- Habitat for fish breeding grounds
- Source of sediment.

Uses of seaweeds

- Seaweeds are important as food for humans, feed for animals, and fertilizer for plants
- Products like agar-agar and alginates, iodine which are of commercial value, are extracted from seaweeds.
- By the biodegradation of seaweeds, methane like economically important gases can be produced in large quantities.
- Extracts of some seaweed species show antibacterial activity.
- Seaweeds are also used as the potential indicators of pollution in the coastal ecosystem, particularly heavy metal pollution due to their strong ability to bind and accumulate metals.

Harmful effects of seaweeds: Rotting seaweed is a potent source of hydrogen sulfide, a highly toxic gas, and has been implicated in some incidents of apparent hydrogen-sulphide poisoning. It can cause vomiting and diarrhoea.

Threats to seaweeds: Eutrophication, siltation, trawling, coastal engineering constructions and over-exploitation for commercial purposes are the major threats.

Therefore, the correct answer is b.

Q20. Answer: b

Explanation: Bio rock Technology or Mineral Accretion Technology is a method that applies safe, low voltage electrical currents through seawater, causing dissolved minerals to crystallize on

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structures, growing into a white limestone similar to that which naturally makes up coral reefs and tropical white-sand beaches. **So, option b is correct.**

ADDITIONAL INFORMATION:

- This material has strength similar to concrete.
- It can be used to make robust artificial reefs on which corals grow at very rapid rates.
- The change in the environment produced by electrical currents accelerates formation and growth of both chemical limestone rock and the skeletons of corals and other shell-bearing organisms.
- Bio rock structures become rapidly colonized by a full range of coral reef organisms, including fish, crabs, clams, octopus, lobster, sea urchins.
- Species typically found in healthy reef environments are given an electrical advantage over the weedy organisms which often overgrow them in reefs stressed by humans.
- The advantages corals gain from mineral accretion are cancelled if they no longer receive current, at which point weeds will overgrow the corals. If the current is maintained, coral reefs can often be restored even in areas where water quality would prevent their recovery by any other method.
- Bio rock structures cement themselves to the hard bottom providing a physical wave barrier which over time, grows larger and stronger. Bio rock materials are to an extent, structurally self-healing. If a section is damaged, the cracks will fill, making them ideal for breakwater shore protection.
- Bio rock projects can be powered by a wide range of electrical sources including renewable energy like windmills, photovoltaic solar panels and tidal current generators. This enables their construction in areas where conventional electric power is unavailable.

Therefore, the correct answer is b.

Q21. Answer: a

Explanation: Payments for ecosystem services (PES), also known as payments for environmental services (or benefits), are incentives offered to farmers or landowners in exchange for managing their land to provide some sort of ecological service. **So, statement (1) is not correct.**

Payment for Ecosystem Services (PES) mainly focuses on Beneficiary Pays Principle (BPP). **So, statement (2) is not correct.**

Himachal Pradesh launched the first payment for ecosystem services in India. **So, statement (3) is correct.**

ADDITIONAL INFORMATION:

- Payments for Ecosystem Services (PES) are an innovative approach to nature conservation.
- Payments for Ecosystem Services is the name given to a variety of arrangements through which the beneficiaries of environmental services, from watershed protection and forest conservation to carbon sequestration and landscape beauty, reward those whose lands provide these services with subsidies or market payments.
- Arranging payments for the benefits provided by forests, fertile soils and other natural ecosystems is a way to recognize their value
- Across the world, environmental conservation is critical to secure the flow of ecosystem services that are essential for people and nature. With funding for natural resource management dwindling, various PES schemes have emerged as potential sources of sustainable financing for conservation.
- Payments for Ecosystem Services encourage the maintenance of natural ecosystems through environmentally friendly practices that avoid damage for other natural resources users. In addition to preserving natural resources, this method improves rural areas and rural lifestyles.

Therefore, the correct answer is a.

Q22. Answer: a

Explanation: The Indian Forest Act, 1927- was enacted to 'consolidate the law related to forest, the transit of forest produce, and the duty liable on timber and other forest produce'. **So, Statement (1) is correct.**

The Forest (Conservation) Act, 1980 was enacted to regulate diversion of forest lands for non-forestry purposes. **So, Statement (2) is correct.**

The Environment (Protection) Act was enacted in the year 1986. It was enacted with the main objective to provide the protection and improvement of environment and for matters connected therewith. The Act is one of the most comprehensive legislations with a pretext to protection and improvement of the environment. The first mention of 33% of forest area appears to have been mentioned in the Forest Policy of 1952. **So, Statement (3) is not correct.**

Therefore, the correct answer is a.

Q23. Answer: b

Explanation: The NGT has the power to hear all civil cases relating to environmental issues and questions that are linked to the implementation of laws listed in Schedule I of the NGT Act. These include the following:

The Water (Prevention and Control of Pollution) Act, 1974;

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The Forest (Conservation) Act, 1980;

The Air (Prevention and Control of Pollution) Act, 1981;

The Environment (Protection) Act, 1986;

The Public Liability Insurance Act, 1991;

The Biological Diversity Act, 2002.

The NGT has not been vested with powers to hear any matter relating to the Wildlife (Protection) Act, 1972, the Indian Forest Act, 1927 and various laws enacted by States relating to forests, tree preservation etc.

Therefore, the correct answer is b.

Q24. Answer: b

Explanation: The north-eastern states of Assam, Nagaland, Manipur, Meghalaya, Tripura, Arunachal Pradesh and Mizoram collectively have more than 30 national parks, wildlife sanctuaries, bird sanctuaries and tiger reserves in North East India. **So, Statement (1) is correct.** Only Punjab does not have any National Park. Hemis National Park (or Hemis High Altitude National Park) is a high-altitude national park in the eastern Ladakh Union Territory of the Republic of India. Globally famous for its snow leopards, it is believed to have the highest density of them in any protected area in the world. It is the only national park in India that is north of the Himalayas, the largest notified protected area in India (largest National park) and is the second-largest contiguous protected area, after the Nanda Devi Biosphere Reserve and surrounding protected areas. **So, Statement (2) is not correct.**

Uttar Pradesh, Bihar and Jharkhand each have one National Park only. They are Dudhwa National Park of Uttar Pradesh, Valmiki National Park of Bihar and Betla National Park of Jharkhand. **So, statement (3) is correct.**

Therefore, the correct answer is b.

Q25. Answer: d

Explanation: Gangetic Dolphin Ganges River Dolphin is a sub-species of river dolphins, found in the Ganga and Brahmaputra Rivers. **So, statement (1) is not correct.**

These species are practically blind and rely on bio-sonar waves to move around. **So, statement (3) is correct.**

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There are almost 2500 river dolphins in Ganga and their population is diminishing. River dolphins have been classified as “endangered” and not “critically endangered” by IUCN (International Union for Conservation of Nature) in 1966. **So, statement (2) is not correct.**

Gangetic Dolphins have been recognized as National aquatic animal of India. **So, statement (4) is correct.**

Therefore, the correct answer is d.

Q26. Answer: d

Explanation: Biodiversity Hotspots - Hotspots are the richest and most threatened reservoirs of plant and animal life of the earth. They have the maximum number of endemic species. They occupy 1.4% of the earth's surface and 20% of the world's human population lives in these areas. Currently, 35 biodiversity hotspots have been identified, most of which occur in tropical forests. India hosts 4 biodiversity hotspots: the Western Ghats, the Eastern Himalayas, the Indo-Burma region and the Sundaland. **So, statement (1) is correct.**

To qualify as a hot spot, a region must meet two strict criteria:

1. Species endemism: the region must contain at least 1,500 species of vascular plants (> 0.5% of the world's total) as endemics, and
2. Degree of threat: the region has to have lost at least 70% of its original habitat.

The biodiversity hotspots are mostly confined to the tropical regions of the world. One idea is that tropical regions harbour greater biodiversity because they are especially fertile grounds for forming new species i.e., “cradles of diversity.” Another idea is that biodiversity hotspots are less likely to lose the species they already have. **So, statement (2) is correct.**

Biodiversity hotspots do not make allowances for changing land-use patterns. Hotspots represent regions with considerable habitat loss, but this does not mean they are experiencing ongoing habitat loss. **So, statement (3) is correct.**

Therefore, the correct answer is d.

Q27. Answer: d

Explanation: Mangroves for the Future (MFF) is a unique partner-led initiative to promote investment in coastal ecosystem conservation for sustainable development.

It is co-chaired by the International Union for the Conservation of Nature (IUCN) and the UN Development Program (UNDP). **So, statement (1) is correct.**

It provides a platform for collaboration among different agencies, sectors and countries, addressing challenges to coastal ecosystems and livelihood issues. The MFF program's primary focus in India is on improving the scientific knowledge base to feed into national policies for enhanced management of coastal and marine ecosystems.

It comprised of a range of governmental departments, NGOs, inter-governmental organizations and academic institutions. MFF's program of work in India is overseen by a National Coordination Body (NCB). The National Strategy and Action Plan (NSAP) guide the work of the NCB. **So, Statements (2) and (3) are correct.**

Therefore, the correct answer is d.

Q28. Answer: c

Explanation: Tso Kar wetland Complex is in Ladakh. It is a high altitude wetland complex in Changthang Cold Desert Wildlife sanctuary. It is an Important Bird Area (IBA) and lies on Central Asian Highway. **So, pair (1) not correctly matched.**

Asan Conservation Reserve- 1st Ramsar site for the state of Uttarakhand. It is in Dehradun district of Uttarakhand and lies on Asan River running down to its confluence with Yamuna River. **So, pair (2) correctly matched.**

Keetham lake- is also called as Sur Sarovar Lake. It is in Uttar Pradesh and was originally created to supply water to Agra city. It is a natural habitat of sarus crane and spotted eagle. It is an

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important bird haven for resident and migratory birds migrating on Central Asian Highway. It is a bird sanctuary and an IBA. **So, pair (3) not correctly matched.**

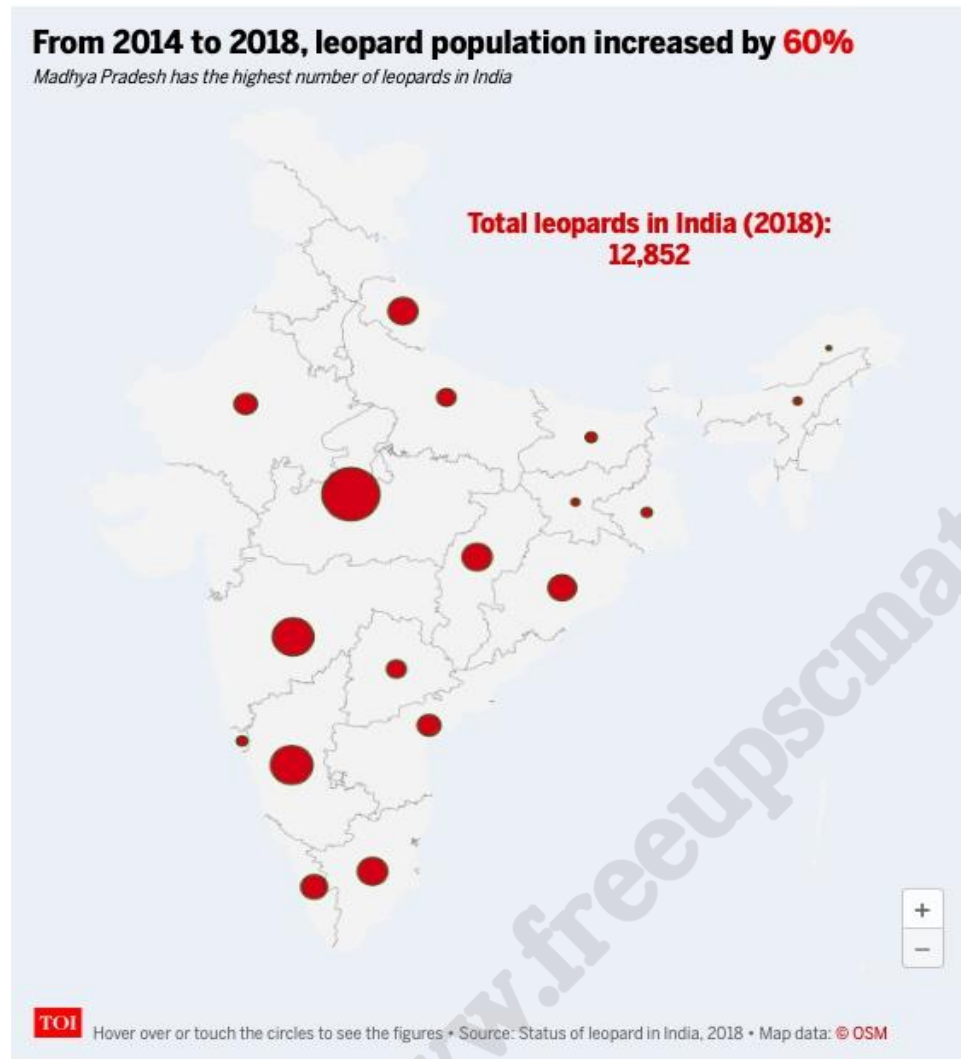
Kabartal- It is the first Ramsar site of Bihar. It is a freshwater marsh of North Bihar's Begusarai district. It lies over Indo-Gangetic plains and acts as a vital flood buffer. It is an important stopover along the Central Asian Flyway. **So, pair (4) correctly matched.**

All the 4 wetlands are recently recognised as Ramsar sites.

Therefore, the correct answer is c.

Q29. Answer: b

Explanation:



According to the Union environment ministry, there has been an over 60 per cent increase in the population of leopards in India since 2014. There were at least 12,852 leopards in the country in 2018 compared to 7,910 leopards estimated in 2014.

Madhya Pradesh has the highest number of leopards – 3,421, followed by Karnataka – 1,783. Maharashtra at 1,690 has the third-largest population of leopards in the country, according to the 'Status of leopards in India, 2018' report.

Therefore, the correct answer is b.

Q30. Answer: b

Explanation: The term anthropocene was coined by Paul Crutzen and Eugene Stoermer in 2000. Anthropogenic Epoch is an informal interval of geologic time, making up the third worldwide division of the Quaternary Period (2.6 million years ago to the present). It is characterized as the time in which the collective activities of human beings (Homo sapiens) began to substantially alter Earth's surface, atmosphere, oceans, and systems of nutrient cycling.

Therefore, the correct answer is b.

Q31. Answer: b

Explanation: 3 species of India were added to Appendix I of CMS at CoP-13 held at Gandhinagar (India) in 2020-

- Asian Elephant
- Great Indian Bustard
- Bengal Florican

Therefore, the correct answer is b.

Q32. Answer: b

Explanation: Living Planet Index is given by the World Wildlife Fund as a part of its Living Planet Report. **So, pair (1) is not correctly matched.**

Wild Bird Index is given jointly by the Birdlife International and UNEP-World Conservation Monitoring Committee (WCMC). **So, pair (2) is correctly matched.**

The Red List Index is based on the IUCN Red List of Threatened Species. It is an indicator of the changing state of global biodiversity. It defines the conservation status of major species groups, and measures trends in extinction risk over time. **So, pair (3) is correctly matched.**

Therefore, the correct answer is b.

Q33. Answer: b

Explanation: In landscape-based conservation, the landscape is defined as a large land area constituted by a mosaic of interacting land-use with people and the impact of their activities as the cornerstone of its management. **So, statement (1) is not correct.**

It allows for ecosystem-level conservation. **So, statement (2) is correct.**

It includes both protected areas of country and areas outside PAN. **So, statement (3) is correct.**

Therefore, the correct answer is b.

Q34. Answer: d

Explanation: As per National Wildlife Action Plan 2017-31- following are the causal factors for increased risks to wildlife health:

- Shared use of forests by human communities and wildlife
- Human population explosion
- Habitat fragmentation
- Climate change

Locusts swarm attacks were responsible for affecting the agricultural crops in India and had an adverse impact on agro-biodiversity of a region.

Therefore, the correct answer is d.

Q35. Answer: a

Explanation:

Diseases caused by VIRUS are:

Influenza: It is a viral infection that attacks your respiratory system — your nose, throat and lungs. **Influenza** is commonly called the flu, but it's not the same as stomach "flu" viruses that cause diarrhoea and vomiting. **Influenza viruses** belong to the family Orthomyxoviridae and have a single-stranded segmented RNA genome.

Smallpox: It is **caused by** infection with the variola virus. The virus can be transmitted: directly from person to person. Direct transmission of the virus requires fairly prolonged face-to-face contact. Most people with smallpox recover, but about 3 out of every 10 people with the disease die. Many smallpox survivors have permanent scars over large areas of their body, especially their faces. **So, (1) is correct.**

Measles: It is a highly contagious illness caused by a virus that replicates in the nose and throat of an infected child or adult. Then, when someone with **measles** coughs, sneezes or talks, infected droplets spray into the air, where other people can inhale them. **Measles is caused by** a virus in the paramyxovirus family. **Measles** is a human disease and is not known to occur in animals.

Poliomyelitis: **Polio**, or **poliomyelitis**, is a disabling and life-threatening disease **caused by** the **poliovirus**. The virus spreads from person to person and can infect a person's spinal cord; **causing** paralysis (can't move parts of the body). **So, (3) is correct.**

Diseases caused by Bacteria are-

Tuberculosis: Tuberculosis (TB) is a potentially serious infectious disease that mainly affects our lungs. The bacteria that cause tuberculosis are spread from one person to another through tiny droplets released into the air via coughs and sneezes.

Syphilis: The cause of syphilis is a bacterium called Treponema pallidum. The most common route of transmission is through contact with an infected person's sore during sexual activity. The bacteria enter your body through minor cuts or abrasions in your skin or mucous membranes. The disease starts as a painless sore. **So, (2) is not correct.**

Diseases caused by PROTOZOAN are-

Malaria: Malaria is a serious and sometimes fatal disease caused by a parasite that commonly infects a certain type of mosquito which feeds on humans. People who get malaria are typically very sick with high fevers, shaking chills, and flu-like illness.

Amoebic Dysentery: amoebic dysentery or amoebiasis, which is caused by an amoeba (single-celled parasite) called Entamoeba histolytica, which is mainly found in tropical areas. Symptoms are fever and chills, nausea and vomiting, watery **diarrhoea**, which can contain blood, mucus, or pus, painful passing of stools, fatigue. **So, (4) is not correct.**

Therefore, the correct answer is a.

Q36. Answer: b

Explanation:

Vitamins Deficiency

1. Vitamin A - Xerophthalmia
2. Vitamin B12 - Pernicious Anaemia
3. Vitamin B3 - Pellagra
4. Vitamin B1 - Beri Beri

VITAMIN A

The top food sources of vitamin A include dairy products, liver, fish, and fortified cereals; the top sources of pro-vitamin A include carrots, broccoli, cantaloupe, and squash. Its severe deficiency causes dryness of cornea resulting in corneal blindness called xerophthalmia.

VITAMIN B12

It is essential for the production and maturation of red blood cells. The intrinsic factor is essential for the absorption of vitamin B12 in the small intestine. The genetic deficiency of intrinsic factor causes a severe deficiency of vitamin B12 resulting in large scale destruction of immature RBCs called pernicious anaemia.

VITAMIN B3

Niacin is Vitamin B3. Deficiency of niacin is called Pellagra characterised by the symptoms of diarrhoea and dementia (memory disorder).

VITAMIN B1

Deficiency of Thiamine (Vitamin B1) is called Beri Beri. It causes lack of energy and lethargy, including muscle weakness.

Therefore, the correct answer is b.

Q37. Answer: d

Explanation: Thyroid is the largest endocrine gland. Prolactin hormone helps in the formation of milk while oxytocin helps in releasing or discharging milk during breastfeeding after the birth of a baby.

Therefore, the correct answer is d.

Q38. Answer: a

Explanation: Innate immunity is a non-specific type of defence, which is present from the time of birth. It provides different types of barriers to the entry of foreign agents into our body. Innate immunity consists of 3 types of barriers. These are:

- Physical barriers: Skin on our body is the main barrier which prevents entry of the microorganisms. Mucus coating of the epithelium lining the respiratory, gastrointestinal and urogenital tracts also help in dropping microbes entering our body. **So, option (3) is correct.**
- Physiological barriers: Acid in the stomach, saliva in the mouth, tears from eyes-all create physiological barriers by preventing microbial growth. **So, Options (1) and (2) are correct.**
- Cellular barriers: Certain types of leucocytes (WBC) of our body prevent microbial growth.

Therefore, the correct answer is a.

Q39. Answer: d

Explanation: It is caused by bacteria streptococcus pneumoniae. **So, statement (1) is not correct.**

It can cause ear infections and it can also lead to more serious infections of the:

- lungs (pneumonia)
- Blood (bacteraemia)
- Covering of the brain and spinal cord (meningitis). **So, statement (2) is correct.**

Streptococcus pneumoniae bacteria spread from person to person through close contact. It can affect anyone irrespective of age. **So, statement (4) is correct.**

The disease is most likely to strike in the winter and spring but there are cases year round. The most common symptoms are chills, fever, chest pain, shortness of breath and severe cough. The germ lies in many people's noses and throats and spread by coughing, sneezing or contact with respiratory secretions.

Anyone can get Pneumococcal Disease but very young children, people of 65 years and older, people of any age who have certain chronic medical problems and people with weakened immune systems are at high risk. Pneumococcal Disease is treated with antibiotics. Pneumococcal Conjugate Vaccine or PCV is a vaccine against disease caused by bacterium Streptococcus pneumoniae. **So, statement (3) is not correct.**

It protects infants, young children, and adults from pneumococcal disease. There are 3 types of PCV available on the global market which goes by the brand names Prevnar, Synflorix and Prevnar 13.

Therefore, the correct answer is d.

Q40. Answer: b

Explanation: Probiotics are live bacteria and yeasts that are good for humans, especially the digestive system. We usually tend to think of these as germs that cause diseases. But, our body is full of bacteria, both good and bad. **So, statement (1) is not correct.**

Probiotics are often called good or helpful bacteria which keep our gut healthy. **So, statement (2) is correct.**

Probiotics are the living microorganisms that are healthy for the host organism. Lactic acid bacteria, Bifido bacteria are common type of microbes used as probiotics. Certain yeast and Bacilli may also be useful. Probiotics are commonly consumed as a part of the fermented food with specially added active live culture such as yoghurt or as dietary supplements.

Therefore, the correct answer is b.

Q41. Answer: a

Explanation: In autologous transplantation, the reinfused stem cells are derived from the patient's own bone marrow and collected from the peripheral blood. These cells do not cause graft-versus-host disease (GVHD), and thus, autologous transplantation is associated with less morbidity and mortality. In Umbilical cord blood transplant, stem cells from umbilical cord blood are used. The umbilical cord connects a foetus to its mother before birth. After birth, the baby does not need it. Cancer centres around the world use cord blood. **So, statement (1) is correct.** Stem cells can be derived from both mammals and non-mammals. **So, statement (2) is not correct.**

iPSC are derived from mature and differentiated somatic cells by adding pluripotency genes or factors. iPSC enables the production of patient-specific pluripotent stem cells. **So, statement (3) is not correct.**

Therefore, the correct answer is a.

Q42. Answer: c

Explanation: There are three different types of artificial cloning: gene cloning, reproductive cloning and therapeutic cloning.

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	Types	Produces
1.	Gene cloning	Copies of genes or segments of DNA. The procedure consists of inserting a gene from one organism, often referred to as "foreign DNA," into the genetic material of a carrier called a vector. Examples of vectors include bacteria, yeast cells, viruses or plasmids. After the gene is inserted, the vector is placed in laboratory conditions that prompt it to multiply, resulting in the gene being copied many times over. So, pair (1) is not correct.
2.	Reproductive cloning	Copies of whole animals. In reproductive cloning, researchers remove a mature somatic cell, such as a skin cell, from an animal that they wish to copy. They then transfer the DNA of the donor animal's somatic cell into an egg cell, or oocyte, that has had its own DNA-containing nucleus removed. So, pair (2) is correct.
3.	Therapeutic cloning	Embryonic stem cells for experiments aimed at creating tissues to replace injured or diseased tissues. It refers to the use of SCNT to reprogram somatic cells into undifferentiated cells (embryonic stem cells) for different therapeutic purposes, such as the treatment of degenerative diseases or traumatic injuries, or to correct genetically predisposed conditions. The major advantage of using SCNT to drive the production of undifferentiated cells for therapeutic uses is that autologous cells can be generated. So, pair (3) is not correct.

Therefore, the answer is c.

Q43. Answer: a

Explanation: The DNA Technology (Use And Application) Regulation Bill, 2019 will provide for the regulation of use and application of Deoxyribonucleic Acid (DNA) technology to establish the identity of certain categories of persons including the victims, offenders, suspects, undertrials, missing persons and unknown deceased persons and for matters connected therewith. **So, statement (1) is correct.**

The Central Government shall, by notification, establish a National DNA Data Bank and such number of Regional DNA Data Banks for every State, or two or more States, as it may deem necessary. A Regional DNA Data Bank shall share all DNA data stored and maintained by it with the National DNA Data Bank. The National DNA Data Bank shall receive DNA data from Regional DNA Data Banks and shall store the DNA profiles received from the DNA laboratories in such format as may be specified by regulations. **So, statement (2) is not correct.**

Therefore, the correct answer is a.

Q44. Answer: b

Explanation: An inactivated/killed vaccine is a vaccine consisting of either whole viruses or bacteria, or fractions of either, that have been grown in culture and then killed using physical (heat, or radiation) and chemical methods (usually formalin). The pathogen particles are destroyed and cannot divide, but the pathogens maintain some of their integrity to be recognized by the immune system and evoke an adaptive immune response.

Such vaccines are more stable and safer than live vaccines because the dead microbes can't mutate back to their disease-causing state. Inactivated vaccines usually don't require refrigeration, and they can be easily stored and transported in a freeze-dried form, which makes them more accessible to people in developing countries. **So, statement (1) is not correct.**

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As compared to a whole-pathogen vaccine approach, a subunit vaccine will only include certain components that originate from disease-causing bacteria, parasites, or viruses. These components, which are otherwise known as antigens, are highly purified proteins or synthetic peptides that are considered to be significantly safer than whole-pathogen vaccine approaches.

So, statement (2) is correct.

Therefore, the correct answer is b.

Q45. Answer: c

Explanation: The mRNA vaccines function differently from traditional vaccines. Traditional vaccines stimulate an antibody response by injecting a human with antigens. mRNA vaccines inject a fragment of the RNA sequence of a virus directly into the cells, which then stimulates an adaptive immune response. mRNA fragment is a specific piece of the virus that carries instructions to build the antigen of the virus. An advantage of RNA vaccines is that they stimulate cellular immunity. **So, statement (4) is correct.**

Unlike DNA vaccines, mRNA vaccines are more fragile as the molecules degrade within minutes when exposed to the *outside environment*, hence they need to be stored in extremely low temperature. **So, statement (3) is correct.**

The risks associated with mRNA strands that did not manage to pass into a human cell are considered to be low, as the fragile mRNA molecule should be quickly broken down inside the body once its drug delivery system has eroded. **So, statement (2) is correct.**

As RNA vaccines are **not** constructed from an active pathogen (or even an inactivated pathogen), they are non-infectious. In contrast, traditional vaccines require the production of pathogens, which could increase the risks of localized outbreaks of the virus at the production facility if done at high volumes. **So, statement (1) is not correct.**

RNA vaccines can be produced faster, cheaper, and in a more standardized fashion (i.e. fewer error rates in production), which improves responsiveness to outbreaks.

Therefore, the correct answer is c.

Q46. Answer: c

Explanation: Central Drugs Standard Control Organization (CDSCO) which comes under the Ministry of Health and Family Welfare is the main body which works on development of regulatory procedures and standards for drugs, cosmetics, diagnostics and devices. It lays down regulatory guidance by amending Acts and Rules; and regulates new drug approval process. **So, statement (1) is correct.**

The Drug Controller General of India (DCGI) is responsible for giving regulatory permissions for clinical trials and is responsible for approval of marketing licenses for drugs in India. **So, statement (2) is correct.**

Therefore, the correct answer is c.

Q47. Answer: d

Explanation: The 2020 Nobel Prize in Physiology or Medicine is awarded to **Harvey J. Alter, Michael Houghton and Charles M. Rice** for the discovery of Hepatitis C virus. Hepatitis, from the Greek names for liver and inflammation, is a disease characterized by-

- Poor appetite, vomiting, fatigue and jaundice – yellow discoloration of the skin and eyes.
 - Chronic hepatitis leads to liver damage, which may progress to cirrhosis and liver cancer.
- Viral infection is the leading cause of hepatitis, with some forms persisting without symptoms for

many years before life-threatening complications develop. Until the 1960's, exposure to blood

from infected individuals was a major health hazard, with up to 30% risk of chronic hepatitis

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following surgery or multiple blood transfusions. This risk was only partially reduced by the discovery of the Hepatitis B virus (HBV) and the eventual elimination of HBV-contaminated blood through testing. A more insidious form of hepatitis, characterized by very mild symptoms in the acute phase and a high risk of progression to chronic liver damage and cancer, remained.

The work of **Alter, Houghton** and **Rice** characterized this form of hepatitis to be a distinct clinical entity, caused by an RNA virus of the *Flavivirus* family, now known as Hepatitis C virus (HCV). This pioneering work has paved the way for the development of screening methods that have dramatically reduced the risk of acquiring hepatitis from contaminated blood and has led to the development of effective antiviral drugs that have improved the lives of millions of people. Statement (2) is correct and related to the CRISPR/Cas9 and not to the Medicine Nobel Prize in 2020. **So, both statements (1) and (2) are not correct.** Therefore, the correct answer is d.

Q48. Answer: c

Explanation: Gene therapy is when DNA is introduced into a patient to treat a genetic disease. The new DNA usually contains a functioning gene to correct the effects of a disease-causing mutation.

Somatic gene therapy: Transfer of a section of DNA to any cell of the body that doesn't produce sperm or eggs. Effects of gene therapy will not be passed onto the patient's children. **So, statement (1) is correct.**

Germline gene therapy: Transfer of a section of DNA to cells that produce eggs or sperm. Effects of gene therapy will be passed onto the patient's children and subsequent generations. **So, statement (2) is correct.**

Therefore, the correct answer is c.

Q49. Answer: d

Explanation: The endocrine or insulin hormone secretion by pancreas does not require any duct (pancreatic duct) so maintenance of normal blood sugar level will not be affected on blocking the duct.

Therefore, the correct answer is d.

Q50. Answer: c

Explanation: Infectious or epidemic hepatitis" is caused by RNA viruses of the Picornaviridae (Hepatitis A virus, HAV) or Hepeviridae (Hepatitis E virus, HEV) families. The disease is mainly transmitted through contaminated food and water, has a short incubation period and manifests as an acute illness that usually resolves and is followed by life-long immunity. **So, the statement (1) is correct.**

Serum hepatitis can be caused by a DNA virus of the *Hepadna* family (hepatitis B virus, HBV), with or without an associated RNA virus of the *Deltaviridae* family (Hepatitis D virus, HDV), or an RNA virus of the *Flaviviridae* family (Hepatitis C virus, HCV). This form of hepatitis spreads through contact with blood or other bodily fluids and has a long incubation period during which apparently healthy individuals can transmit the disease. In a significant proportion of affected individuals, the infection becomes chronic, which can lead to liver failure and cancer.

Through the development of novel technologies, protective vaccines against HAV and HBV are now widely available. The discoveries of HBV and HCV, and the establishment of effective screening routines, have virtually eliminated the risk of transmission via blood products in many

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parts of the world. Thanks to the development of highly effective drugs against HCV, it is now possible, for the first time in human history, to foresee a future where the threat of this virus infection is substantially reduced and hopefully soon eliminated.

Q51. Answer: b

Explanation: The complete process of recombinant DNA technology includes a specific sequence:

Step-1	Isolation of Genetic Material.	Isolate the desired DNA in its pure form i.e. free from other macromolecules.
Step-2	Cutting the gene at the recognition sites.	The restriction enzymes play a major role in determining the location at which the desired gene is inserted into the vector genome. These reactions are called 'restriction enzyme digestions'.
Step-3	Amplifying the gene copies	It is a process to amplify a single copy of DNA into thousands to millions of copies once the proper gene of interest has been cut using the restriction enzymes.
Step-4	Ligation of DNA Molecules.	Ligation is joining of the two pieces – a cut fragment of DNA and the vector together with the help of the enzyme DNA ligase.
Step-5	Insertion of Recombinant DNA Into Host.	The recombinant DNA is introduced into a recipient host cell. It is termed as Transformation. Once after the insertion of the recombinant DNA into the host cell, it gets multiplied. The effectively transformed cells/organisms carry forward the recombinant gene to the offspring

Therefore, the correct answer is b.

Q52. Answer: b

Explanation: Zika virus disease is caused by a virus transmitted primarily by Aedes mosquitoes, which bite during the day. Symptoms are generally mild and include fever, rash, conjunctivitis, muscle and joint pain, malaise or headache. Symptoms typically last for 2–7 days. Most people with Zika virus infection do not develop symptoms.

Zika virus infection during pregnancy can cause infants to be born with microcephaly and other congenital malformations, known as congenital Zika syndrome. Infection with Zika virus is also associated with other complications of pregnancy including preterm birth and miscarriage. An increased risk of neurologic complications is associated with Zika virus infection in adults and children, including Guillain-Barre syndrome, neuropathy and myelitis.

Zika virus is also transmitted from mother to fetus during pregnancy, through sexual contact, transfusion of blood and blood products, and organ transplantation. **So, the statement (2) is correct.**

The funeral procession or burial ceremonies involving direct contact with the deceased's body may lead to transmission of Ebola virus disease. **So, the statement (1) is not correct.**

Therefore, the correct answer is b.

Q53. Answer: b

Explanation: Unlike nuclear DNA, which is passed in equal parts to a child from both parents, mitochondria are inherited solely from mothers. **So, statement (1) is not correct.** Y-linked inheritance is only from father to son. **So, statement (2) is correct.**

Therefore, the correct answer is b.

Q54. Answer: c

Explanation: The term 5G is used to describe the next-generation of mobile networks beyond Long Term Evolution (LTE) mobile networks. **So, statement (1) is correct.**

Advantages

- 5G network speeds have a peak data rate of 20 GB/s for the downlink and 10 GB/s for the uplink, much faster than 4G technologies. **So, statement (2) is not correct and statement (3) is correct.**
- Latency in a 5G network could get as low as 4 milliseconds in a mobile scenario and can be as low as 1 millisecond in ultra-reliable low latency communication scenarios. **So, statement (4) is correct.**

Therefore, the correct answer is c.

Additional Information:

Long Term Evolution (LTE): LTE is a wireless communications standard based on 4G. It is developed by the 3rd Generation Partnership Project (3GPP) that are designed to provide up to 10x the speeds of 3G networks for mobile devices such as smartphones, tablets, netbooks, notebooks and wireless hotspots.

Latency: It is a networking term to describe the total time it takes a data packet to travel from one node to another. In other contexts, when a data packet is transmitted and returned back to its source, the total time for the round trip is known as latency.

Q55. Answer: d

Explanation: Blockchain technology is a structure that stores transactional records (known as the block) of the public in several databases (known as the chain) in a network connected through peer-to-peer nodes. This storage is referred to as a digital ledger. The three key principles of blockchain technology are transparency, decentralization and accountability. Blockchain applications go far beyond cryptocurrency and bitcoin. With its ability to create more transparency and fairness while also saving businesses time and money, the technology is impacting a variety of sectors such as,

- Secure sharing of medical data
- Music royalties tracking
- Cross-border payments
- Real-time IoT operating systems, for instance Filament.
- Personal identity security
- Anti-money laundering tracking system, for instance Civic.
- Supply chain and logistics monitoring
- Voting mechanism
- Original content creation, for example MEDIACHAIN

Therefore, the correct answer is d.

Q56. Answer: b

Explanation: Metadata describes and gives information about other data. It provides information about a certain item's content. For example, an image may include metadata that describes how large the picture is, the colour depth, the image resolution, when the image was created, and other data. A text document's metadata may contain information about how long the document is, who the author is, when the document was written, and a short summary of the document. **So, statement (1) is not correct.**

The phrase "big data" is often used to describe large amounts of data. It does not refer to a specific amount of data, but rather describes a dataset that cannot be stored or processed using traditional database software. **So, statement (2) is correct.**

Therefore, the correct answer is b.

Additional Information:

Big data refers to the large, diverse sets of information that grow at ever-increasing rates. It encompasses the volume of information, the velocity or speed at which it is created and collected, and the variety or scope of the data points being covered (known as the "three v's" of big data). Big data often comes from data mining and arrives in multiple formats.

- It can be structured (often numeric, easily formatted and stored) or unstructured (more free-form, less quantifiable).
- Nearly every department in a company can utilize findings from big data analysis, but handling its clutter and noise can pose problems.
- It can be collected from publicly shared comments on social networks and websites, voluntarily gathered from personal electronics and apps, through questionnaires, product purchases, and electronic check-ins.
- It is often stored in computer databases and is analysed using software specifically designed to handle large, complex data sets.

Q57. Answer: d

Explanation: 2Africa is one of the largest subsea cable projects in the world running 37,000 km long, connecting Europe, the Middle East, and 16 countries in Africa, and will provide internet capacity and reliability across much of the Middle East and Africa supporting the growth of 4G, 5G, and fixed broadband access for hundreds of millions of people and businesses.

Working with local partners, China Mobile International, Facebook, MTN GlobalConnect, Orange, etc, Telecom Egypt, Vodafone and WIOCC will partner to build 2Africa. Telecom Egypt will provide 2Africa with brand-new Trans Egypt crossing routes, with the option to have a seamless optical path between East Africa and Europe. **So, neither statement (1) nor (2) is correct.**

Therefore, the correct answer is d.

Q58. Answer: d

Explanation: Augmented reality (AR) is an interactive experience of a real-world environment where the objects that reside in the real-world are enhanced by computer-generated perceptual information. **So, statement (1) and statement (3) are correct.**

Virtual Reality (VR) is the use of computer technology to create a simulated environment. Unlike traditional user interfaces, VR places the user inside an experience. Instead of viewing a screen in front of them, users are immersed and able to interact with 3D worlds. **So, statement (2) and statement (4) are correct.**

Therefore, the correct answer is d.

Q59. Answer: c

Explanation: A denial-of-service (DoS) attack is an intentional cyberattack carried out on networks, websites, and online resources to restrict access to its legitimate users. This is usually done by overloading the target network or site with fake system requests, preventing legitimate users from accessing it, sometimes crashing or damaging a system outright. DoS attacks may last anywhere from a few hours to many months. **So, statement (1) is correct.**

A common type of DoS attack that is prevalent on the web is called the distributed denial-of-service (DDoS) attack that relies on infected computers or devices from around the world in a coordinated effort to block access. **So, statement (2) is correct.**

Therefore, the correct answer is c.

Q60. Answer: d

Explanation:



केन्द्रीय बजट
UNION BUDGET 2020

Budget 2020 announced Rs 8,000 crore over the next 5-yrs in the National Mission on Quantum technology and its applications

- The areas of focus for the NM-QTA Mission will be in fundamental science, translation, technology development and towards addressing issues concerning national priorities
- The mission can help prepare next generation skilled manpower, boost translational research and also encourage entrepreneurship and start-up ecosystem development.
- Quantum principles will be used for engineering solutions to extremely complex problems in computing, communications, sensing, chemistry, cryptography, imaging and mechanics



- Their applications which will be boosted include those in aero-space engineering, numerical weather predictions, simulations, securing the communications & financial transactions, cyber security, advanced manufacturing, health, agriculture, education
- It can bring India in the list of few countries with an edge in this emerging field will have a greater advantage in garnering multifold economic growth and dominant leadership role

Therefore, the correct answer is d.

Q61. Answer: c

Explanation: GPAI is an international and multi-stakeholder initiative to guide the responsible development and use of AI, grounded in human rights, inclusion, diversity, innovation, and economic growth.

With this, India has joined the league of leading nations and economies including the US, the UK, EU, Australia, Canada, France, Germany, Italy, Japan, Mexico, New Zealand, Republic of Korea, and Singapore for launch of GPAI. It was launched in June 2020. **So, statement (2) is correct.**

It will be supported by a Secretariat, and hosted by the Organisation for Economic Cooperation and Development (OECD) in Paris and two Centres of Expertise - one each in Montreal and Paris.

So, statement (1) is correct.

Therefore, the correct answer is c.

Q62. Answer: d

Explanation: The last of the four indigenously built Anti-Submarine Warfare (ASW) stealth corvettes 'INS Kavaratti' under Project 28 (Kamorta class) was commissioned into the Indian Navy. **So, statement (1) is correct.**

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The potent stealth ASW corvette, Kavaratti has been indigenously designed by the Indian Navy's in-house organisation Directorate of Naval Design (DND), and built by Garden Reach Shipbuilders and Engineers (GRSE) in Kolkata. **So, statement (2) is correct.**

This initiative portrays the growing capability of the Indian Navy, GRSE and the nation in becoming self-reliant, in tune with the national objective of 'Atmanirbhar Bharat'. The ship has up to 90% indigenously built content and the use of carbon composite for the superstructure is a commendable feat achieved in Indian shipbuilding. **So, statement (3) is correct.**

The ship's weapons and sensors suite are predominantly indigenous. Kavaratti has state-of-the-art weapons and sensor suite which are capable of detecting and destroying submarines. In addition to its anti-submarine warfare capability, the ship has a credible self-defence capability and good endurance for long-range deployments.

Therefore, the correct answer is d.

Q63. Answer: b

Explanation: The Feluda test, a coronavirus detection test developed by the Council of Scientific and Industrial Research (CSIR) and commercialised by Tata Sons. **So, statement (1) is not correct.**

FELUDA, which stands for FNCAS9 Editor-Limited Uniform Detection Assay, is also unlike antigen tests in that it uses a CRISPR-cas9 based system and therefore more accurate in detecting the virus. **So, statement (2) is correct.**

The test still requires a nasal swab to be collected and sent to a lab, promises to be quicker than the gold-standard test because it doesn't need the expensive RT-PCR (Reverse transcription-quantitative polymerase chain reaction) machine that can set back a lab by at least ₹25 lakh. A smaller, cheaper more portable machine called a thermocycler, which costs around ₹25,000, is employed and once the viral RNA is extracted, it takes anywhere from 45 minutes to an hour to confirm the presence of the virus.

Therefore, the correct answer is b.

Q64. Answer: c

Explanation: DNA vaccines are third generation vaccines, made up of small, circular pieces of bacterial DNA, plasmids. These plasmids are genetically engineered to produce specific antigens from a pathogen. The DNA is injected into the cells of the body where the host cell then interprets the DNA and uses it to synthesize the pathogen's proteins. An immune response is then triggered when the pathogen's proteins are recognized as foreign to the immune system. **So, both statements (1) and (2) are correct.**

Therefore, the correct answer is c.

Q65. Answer: b

Explanation: The Green Climate Fund (GCF) is the world's largest dedicated fund helping developing countries reduce their greenhouse gas emissions and enhance their ability to respond to climate change. It was set up by the United Nations Framework Convention on Climate Change (UNFCCC) in 2010. GCF has a crucial role in serving the Paris Agreement, supporting the goal of keeping average global temperature rise well below 2 degrees C. It does this by channelling climate finance to developing countries, which have joined other nations in committing to climate action. The GCF aims for a 50:50 ratio between mitigation and adaptation investments over time. **So, statement (1) is not correct.**

The Global Environment Facility (GEF) was established on the eve of the 1992 Rio Earth Summit to help tackle our planet's most pressing environmental problems.

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The GEF provides funding to assist developing countries in meeting the objectives of international environmental conventions. The GEF serves as a "financial mechanism" to five conventions: Convention on Biological Diversity (CBD), United Nations Framework Convention on Climate Change (UNFCCC), Stockholm Convention on Persistent Organic Pollutants (POPs), UN Convention to Combat Desertification (UNCCD), and Minamata Convention on Mercury. **So, statement (2) is correct.**

Therefore, the correct answer is b.

Q66. Answer: b

Explanation: The WMO Greenhouse Gas Bulletin reports on atmospheric concentrations of greenhouse gases. Emissions represent what goes into the atmosphere. Concentrations represent what remains in the atmosphere after the complex system of interactions between the atmosphere, biosphere, lithosphere, cryosphere and the oceans. About a quarter of the total emissions are absorbed by the oceans and another quarter by the biosphere. **So, option b is correct.**

Therefore, the correct answer is b.

Q67. Answer: a

Explanation: Greater humidity means the presence of water vapour. The density of water vapour is less than dry air. The speed of sound is inversely proportional to the density of a medium so greater the humidity in the air, higher will be the speed of sound. **So, statement (1) is correct.** The speed of sound in air is directly proportional to the square root of temperature which means as the speed of sound in air will increase with the rise in temperature. **So, statement (2) is not correct.**

Therefore, the correct answer is a.

Q68. Answer: a

Explanation: Carnelian is a form of chalcedony that has been turned red by heating. It is rarely found in nature. Heating the stone causes the oxides of iron to become yellow, orange and red. It was one of the most popular and widespread semi-precious stones in the ancient Near East and India, and became one of the most valuable stones after lapis lazuli in the manufacture of jewellery and seals. Harappans made various ornaments and beads out of it. **So, option (1) is correct.**

Harappa was a Bronze Age civilization that was based primarily on the copper alloy. **So, option (2) is not correct while (4) is correct.**

Lapis lazuli artifacts have been found at various sites like Bhirrana, which is one of the oldest sites of Indus Valley Civilization. It was highly valued by the Indus Valley Civilization and apparently they set up long distance posts like Shortughai to procure it from other regions. **So, option (3) is correct.**

Therefore, the correct answer is a.

Q69. Answer: d

Explanation: The Yajur Veda contains not only hymns but also rituals to accompany their recitation, the latter reflecting the social and political milieu of the time. **So, statement (1) is correct.**

The Atharva Veda contains charms and spells to ward off evils and diseases, its contents throwing light on the beliefs and practices of the non-Aryans. **So, statement (2) is correct.**

The collections of Vedic hymns or mantras are known as the Samhitas. The Rig Veda Samhita is the oldest Vedic text, based on which we have described the early Vedic age. For the purpose of recitation, the prayers of the Rig Veda were set to tune, and this modified collection was known as the Sama Veda. The Vedic Samhitas were followed by the composition of a series of texts

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known as the Brahmanas. These are replete with ritualistic formulae and explain the social and religious meaning of rituals. All these later Vedic texts were compiled in the upper Gangetic basin in c. 1000–500 BC.

Therefore, the answer is d.

Q70. Answer: c

Explanation: Kanada, who also wrote the basic text governing the Vaisheshika philosophy, is considered the founder of this school. It believes in the physicality of the Universe and is considered to be the realistic and objective philosophy that governs the universe. They argue that everything in the universe was created by the five main elements: fire, air, water, earth and ether (sky). These material elements are also called Dravya. **So, statement (1) is correct.**

They also believe that the laws of karma guide this universe, i.e. everything is based on the actions of human beings. We are rewarded or punished according to our actions. **So, statement (2) is correct.**

Therefore, the correct answer is c.

Q71. Answer: d

Explanation: The Bodhisattvas seek to understand reality through wisdom or prajna and to actualize it through compassion or Karuna. They realize that since no individual has a “self,” there can be no real difference between themselves and others, and therefore their own liberation is not distinct from the liberation of all beings. **So, statement (1) is correct.**

Bodhisattva is central to Mahayana ideology and is one who seeks to become a Buddha. Mahayana teaches that anyone can aspire to achieve awakening Bodhicitta-pada and thereby become a Bodhisattva. **So, statement (2) is correct.**

Therefore, the answer is d.

Q72. Answer: b

Explanation: The early Vedic society was pastoral, cattle rearing being the dominant occupational activity. A pastoral society relies more on animal wealth than on agricultural activities. Hymns of Rig Veda yield extensive evidence of the importance of cattle in Early Vedic Society. Many linguistic expressions in the Rig Veda are associated with the cow (gau).

- **Gomat:** cattle were the chief measure of wealth. Someone who owned many cattle was called a Gomat.
- **Gojit:** winner of a cow was referred as a hero. **So, pair (1) is correctly matched.**
- **Gavishti, Gavesana, Gavyat:** These were terms used for conflicts and battles.
- **Gopati:** The Raja or the chief was called Gopati, meaning one who protects the cow.
- **Godhuli (dusk) and Samgava (morning):** A term used for a measure of time. **So, pair (3) is not correctly matched.**
- **Gavyuti:** A measure of distance. **So, pair (2) is not correctly matched.**
- **Duhitr:** Daughter is called Duhitr or one who milks the cows.
- **Gotra:** Kinship units are labelled as Gotra.

All these terms are derived from gau (cow) and suggest that social, religious, economic and all-important areas of Rig Vedic life centered on the rearing of cows. Literary reference to pasture lands, cow pen, dairy products and domestic animals are also found in most of the hymns and prayers.

Therefore, the answer is b.

Q73. Answer: c

Explanation: Gautama Buddha's three main disciples known as Upali, Ananda and Mahakashyap remembered his teachings and passed them on to his followers.

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It is believed that soon after the Buddha's death a Council was called at Rajagriha where Upali recited the Vinaya Pitaka (rules of the order) and Ananda recited the Sutta Pitaka (Buddha's sermons or doctrines and ethics). Sometime later the Abhidhamma Pitaka consisting of the Buddhist philosophy came into existence. **So, statement (2) is correct.**

It is the last of the three pitakas constituting the **Pali Canon**, the scriptures of **Theravada Buddhism**. **So, statements (1) and (3) are not correct.**

It is a detailed scholastic reworking of material appearing in the Suttas, according to schematic classifications. It does not contain systematic philosophical treatises, but summaries or enumerated lists.

Therefore, the correct answer is c.

Q74. Answer: c

Explanation: The Buddhist Councils-

1) First Buddhist Council

Time: According to tradition shortly after the death of Buddha the first Buddhist Council was held in 483 BCE.

Place: Satparni cave near Rajagriha.

King: Ajatshatru

Presided by: Mahakassapa

Activities

All the teachings of Buddha were divided into two Pitakas - Sutta Pitaka and Vinaya Pitaka.

Sutta Pitaka was compiled under the leadership of Ananda and Vinaya Pitaka was compiled under the leadership of Upali. **So, pair (1) is correctly matched.**

2) Second Buddhist Council

Time: 383 BCE - 100 years after the first council

Place: Vaishali

King: Kalashoka

Presided by: Subukami

Activities

The monks of Vaishali and Pataliputra had accepted certain rules which were declared as contrary to the teaching of Buddha by the monks of Kaushambi and Avanti. The council failed to bring about a compromise between the two opposing groups. Hence the council ended in a permanent split of the Buddhist order into Sthavirvadins and Mahasanghikas. The former upheld the orthodox Vinaya Pitaka while the later favoured the new rules and their further relaxation. **So, pair (2) is correctly matched.**

3) Third Buddhist Council

Time: During the reign of Ashoka

Place: Pataliputra

King: Ashoka

Presided by: Moggaliputta Tissa

Activities

Philosophical interpretation of the doctrines of Buddha were collected into the third Pitaka called Abhidhamma Pitaka.

An attempt was made in this council to free the Buddhist order from the dissidents and innovations. Heretical monks numbering sixty thousand were expelled from the order. The true canonical literature was defined and authoritatively settled to eliminate all disruptive tendencies. **So, pair (3) is correctly matched.**

4) Fourth Buddhist Council

Time: During the reign of Kanishka

Place: Kashmir

King: Kanishka

Presided by: Vasumitra

Activities

The council was a gathering of Hinayanists of North India. It compiled three commentaries (Vibhashas) of the three Pitakas. It decided certain controversial questions of differences that arose between the Sarvastivada teachers of Kashmir and Gandhara. **So, pair (4) is correctly matched.**

Therefore, the correct answer is c.

Q75. Answer: a

Explanation: Ajivika Philosophy

Around the 6th century BC, there was an explosion all across India of different schools of thought and philosophy at the time of the Buddha.

One of the most popular was the Ajivikas sect, Makkhali Goshala was its most important leader.

- The Ajivikas' central belief was that absolutely everything was predetermined by fate or niyati, and hence human action has no consequence one way or the other. **So, statement (1) is correct.**
- Like Jains, the Ajivikas wore no clothes and lived as ascetic monks in organised groups.
- They were known to practice extremely severe austerities, such as lying on nails, going through the fire, exposing themselves to extreme weather, and even spending time in large earthen pots for penance. **So, statement (2) is correct.**
- There was no caste discrimination, and people from all walks of life joined them. **So, statement (3) is not correct.**
- The Barabar Caves (ancient rock-cut caves) in Bihar dating from the Mauryan Empire were made for Ajivikas and Jains to retreat and meditate.
- Buddhist and Jain texts are very critical of the Ajivikas; they were considered fairly important rivals of both.
- The sect reached its peak during the reign of Mauryan Emperor Bindusara, who was a follower of Ajivikas.
- Asoka himself, best known for his spreading of Buddhism all over India and Southeast Asia, was an Ajivika for most of his life.

Therefore, the correct answer is a.

Q76. Answer: c

Explanation: Mahayana School

It developed after the fourth Buddhist council. In opposition to the group of Hinayana sect (or Theravada sect or "monastic Buddhism") who believed in orthodox teachings of Buddha, those who accepted the new ideas were called the Mahayana sect. They made an image of Buddha and worshipped it as god. In the first century AD, during the period of Kanishka some doctrinal changes were made. **So, statement (1) is correct.**

Features of Mahayana School

- It opens the possibility of Buddhahood to all sentient beings.
- New Sutras or texts were added to the Buddhist canons.
- Bodhisattva is one who seeks awakening (Bodhi), hence, an individual on the path of becoming a Buddha. For e.g. in the Theravada tradition, the term Bodhisattva was used to refer to Buddha Shakyamuni (as Gautama Siddhartha is known) in his former lives. The stories of his previous lives, the Jatakas, portray the efforts of the Bodhisattva to cultivate various qualities, which will define him as a Buddha.
- In this tradition, it was thought that anyone who made aspirations to awakening (Bodhicittotpada); vowing to become a Buddha; is therefore a Bodhisattva. He has the ability

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to access nirvana, but instead of doing so, he chooses to delay his nirvana to guide and teach others to achieve freedom from suffering. **So, statement (2) is correct.**

- Though it also spread to South East Asia, its greatest impact was felt on the East Asian nations of China, Korea and Japan.

The term Hinayana is a pejorative Sanskrit word which literally means "Lesser Vehicle". Mahayana literature uses this term to refer to non-Mahayanist schools, including the Theravada, Sarvastivada, Mahasanghika and some other Buddhist Schools. An increasing number of scholars now prefer to use the term "Mainstream Buddhist Schools" instead of Hinayana, which is clearly Mahayanist derogation.

Therefore, the correct answer is c.

Q77. Answer: b

Explanation: Fourth Buddhist Council was convened in Kashmir under the patronage of the King Kanishka. It resulted in the division of all the Buddhists into two major sects:

- Sarvastivadins (popular in Kashmir and Mathura regions) and Mahasanghikas together forming the Mahayanists (followers of the Greater Vehicle),
- Sthaviravadins and others forming the Hinayanists (followers of the Lesser Vehicle).

Thus, Sthaviravadins is not part of Mahayana. Mahasanghika believed in Buddha as deity, hence giving rise to Mahayana Buddhism. **So, statement (1) is not correct while (3) is correct.**

The Mahasanghikas gave rise to the following sects:

1. Ekavyaharikas
2. Lokottaravadins. **So, statement (2) is correct.**
3. Kukkutikas
4. Bahusrutiyas
5. Prajnapativadins
6. Chaitya-sailas
7. Aparasailas
8. Uttarasailas

Therefore, the correct answer is b.

Q78. Answer: c

Explanation: There are four Vedas, namely, the- Rig Veda, Yajur Veda, Sama Veda and Atharva Veda. Each Veda consists of the Brahmanas, the Upanishads and the Aranyakas. The Upanishads mark the culmination of Indian thought and are the final parts of the Vedas. As the **Upanishads** contain abstract and difficult discussions of ultimate philosophical problems, they were taught to the pupils at the end. That is why they **are called the end of Vedas**. Vedas start with the worship of the manifest, as that is obvious and then slowly transform to the knowledge of the un-manifest.

Therefore, the correct answer is c.

Q79. Answer: d

Explanation: Later Vedic Religion and Philosophy

A great change in religious beliefs and practices had taken place between the Early Vedic and the Later Vedic period. These changes were partly related to the shift from pastoralism to agriculture and reflected the socio-political and economic changes that had taken place.

The fact that Atharvan religious tradition was considered to be part of the Vedic religious system suggests assimilation of different cultures and beliefs into the Vedic religious system.

The Sacrificial Rituals

Sacrifices had become very important during this period and they assumed both a public and private character. Sacrifice is represented as the act which created the world, and the correct performance of the sacrifice was seen as necessary to regulate life and the world. While some

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sacrifices involved participation of just one priest, others involved many more, and the ritual specialists were extremely important. **So, statement (1) is correct.**

There are varieties of Vedic sacrifices

- Grander, longer, more elaborate ones which involved the participation of many different ritual specialists along with their assistants, which must have been performed by wealthy people and kings.
- Agnihotra was a simple domestic sacrifice, to be performed daily by the head of a dvija household, morning and evening. It involved pouring of oblation of milk, and sometimes vegetal substances, into the fire, to the god Agni. **So, statement (2) is correct.**

Complex Sacrifices associated with Kingship-

- **Vajapeya Sacrifice:** It was connected with the attainment of power and prosperity, and also contained a number of fertility rites. It contained a ritual chariot race in which the rajan raced against his kinsmen and defeated them.
- **Ashvamedha Sacrifice:** It was a sacrifice associated with claims of political paramountcy and incorporated several fertility rites as well.
- **Rajasuya Sacrifice:** It was the royal consecration ceremony. Apart from a number of agrarian fertility rites, it included a ritual cattle raid, in which the rajan raided the cattle of his kinsmen and a game of dice, which the king won. At a larger symbolic level, in the Rajasuya, the king was presented as standing in the centre of the universe's cyclical processes of regeneration.

Some of the rituals performed in these sacrifices show elements of a fertility cult. For instance, the Asvamedha sacrifice required the chief queen to lie next to the sacrificial horse, where the queen represented the earth, and this ritual was thought to ensure the prosperity of the king. **So, Statement (3) is correct.**

Changing Gods

- Two prominent Early Vedic gods, Indra and Agni lost their importance. Prajapati the creator became important. **So, statement (4) is correct.**
- This phenomenon represents the importance of sedentism now, since creation myths are important in the agrarian groups.
- **Rudra**, a minor deity in Rig Veda, became important now
- **Vishnu** was conceived as the creator and protector of the universe.
- **Pushan** who protected cattle in the former period now became the god of the Sudras.

The changing statuses of deities are an indication of the change in the character of tribes from pastoral groups to sedentary agriculturist groups. The Early Vedic gods who represented natural phenomena were slowly discarded and the personification of natural elements as divine beings became very complex. It was no longer easy to find the natural element which represented a particular god from the hymns of the Later Vedic period.

Therefore, the correct answer is d.

Q80. Answer: d

Explanation: Anekantavada is the Jain doctrine about metaphysical truth that emerged in ancient India. It states that the ultimate truth and reality is complex and has multiple aspects. According to Jainism, no single and specific statement can describe the nature of existence and the absolute truth. It has also been interpreted as Non-absolutism or "intellectual ahimsa". However, it doesn't deny the existence of objective truth. It only questions the limitations or capacity of a human mind to sense and comprehend it completely. It states that the ultimate truth and reality is complex and has multiple aspects. **So, statement (2) is not correct.**

However, the Shunyavada of Buddhism (given by Nagarjuna) conceived the doctrine of void meaning that everything which is around us is emptiness and whatever we perceive is mere illusion. This void is in fact the nirvana or end to the cycle of birth and rebirth. **So, statement (1) is not correct.**

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Therefore, the correct answer is d.

Q81. Answer: c

Explanation: Buddhism and Jainism are ancient religions that developed in response to the Brahmanism. Buddhism is based on the teachings of Gautama Buddha, while Jainism is based on the teachings of Mahavira. These are the following text related to each religion:

Religion	Some Important Texts
Jainism	Angas, Upangas, Parikarnas, Chhedasutras, Mulasutras, Kalpasutras and Sutra-granthas. So, (1), (3) and (6) are correct
Buddhism	Tripitakas, Milindapanho, Dipavamsha and Mahavamsha.
Vaishnavism	Vedas, Upanishads, Bhagavad Gita, Pancaratra (Agama) texts, Naalayira Divya Prabandham and the Bhagavata Purana.

Therefore, the correct answer is c.

Q82. Answer: a

Explanation: Buddhism and Jainism are ancient religions that developed in Ancient India. Buddhism is based on the teachings of Gautama Buddha, while Jainism is based on the teachings of Mahavira. Apart from this, there are many similarities between Buddhism and Jainism on the grounds of terminology and ethical principles, but the way they are applied is different.

Buddhism	Jainism
Rebirth is one of the principal beliefs in Buddhism. It is thought that the endless cycle of birth and re-birth can only be broken by attaining nirvana (enlightenment). So, statement 1 is not correct	Jainism believes that the circle of rebirths and deaths will continue due to good or bad deeds until liberation is achieved.
Sin is not a concept in Buddhism	Sin is defined as harm to others
The principal teaching of Buddhism is that life is suffering and to escape suffering (end cause of desire) one needs to dispel ignorance by realizing the Four Noble Truths and practising the Eightfold Path	Jainism lays emphasis on the respect of all living beings. Liberation from the cycle of rebirths is attained by taking the Five Vows and following the principles of the Three Jewels
According to some texts in Buddhism, there are beings in heaven but they are bound by "samsara".	Deities in Jainism are known as "Tirthankaras". But they are not worshipped in the conventional sense as they are regarded as wise teachers whose teachings must be followed
Buddhism does not believe in the existence of God; they instead focus on achieving enlightenment—a state of inner peace and wisdom.	Jainism does believe in God, not as a creator, but as a perfect being. When a person destroys all his karmas, he becomes a liberated soul. He lives in a perfect blissful state in Moksha forever. The liberated soul possesses infinite knowledge, infinite vision, infinite power, and infinite bliss. This living being is a God in Jainism. So, statement 2 is correct.

Therefore, the answer is a.

Q83. Answer: d

Explanation: The Bhakti movement was based on the doctrine that the relationship between God and man is through love and worship rather than through performing any ritual or religious ceremonies. It was in south India for the first time that bhakti movement grew from a mere religious

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doctrine to a broad-based popular movement. Following are the list of various bhakti saints and their region and time.

Bhakti Saint	Time Period	Region
Ramanuja	1017-1137	South India
Ramananda	14-15 century	North India
Kabir	1440-1510	Uttar Pradesh
Guru Nanak	1469-1538	Punjab
Vidhyapati	14-15 century	Maithili
Purandar Das	1480-1564	Karnataka
Mirabai	1498-1546	Rajasthan
Vallabhacharya	1479-1531	Nathdwara, Mewar region of Rajasthan
Surdas	1483-1563	Agra
Tulsidas	1532-1623	Uttar Pradesh
Shankara Deva	1544-1603	Assam
Dadu Dayal	1544-1603	Rajasthan
Thyagaraja	1767-1847	Tamil Nadu

Therefore, the correct answer is d.

Q84. Answer: b

Explanation: Akbar, the eldest son of Humayun, ascended the throne in 1556 and ruled till 1605. He was a patron of art, and in his court, many people flourished, called the nine jewels of Akbar. The following table shows the chronology of various bhakti saints:

500-800 CE	Appar, Sambandar, Sundaramurti in Tamil Nadu
800-900	Nammalvar, Manikkavachakar, Andal, Tondaradippodi in Tamil Nadu
1000-1100	Al Hujwiri, Data Ganj Bakhsh in Punjab; Ramanujacharya in Tamil Nadu
1100-1200	Basavanna in Karnataka
1200-1300	Jnanadeva, Muktabai in Maharashtra; Khwaja Muinuddin Chishti in Rajasthan; Bahauddin Zakariya and Fariduddin Ganj-i-Shakar in Punjab; Qutbuddin Bakhtiyar Kaki in Delhi
1300-1400	Lal Ded in Kashmir; Lal Shahbaz Qalandar in Sind; Nizamuddin Auliya in Delhi; Ramananda in Uttar Pradesh; Chokhamela in Maharashtra; Sharafuddin Yahya Maneri in Bihar
1400-1500	Kabir, Raidas, Surdas in Uttar Pradesh; Baba Guru Nanak in Punjab; Vallabhacharya in Gujarat; Abdullah Shattari in Gwalior; Muhammad Shah Alam in Gujarat; Mir Sayyid Muhammad Gesu Daraz in Gulbarga, Shankaradeva in Assam; Tukaram in Maharashtra
1500-1600	Sri Chaitanya in Bengal; Mirabai in Rajasthan; Shaikh Abdul Quddus Gangohi, Malik Muhammad Jaisi, Tulsidas in Uttar Pradesh, Samarth Ramdas . So, options 2 and 3 are correct.
1600-1700	Shaikh Ahmad Sirhindi in Haryana; Miyan Mir in Punjab

Therefore, the correct answer is b

Q85. Answer: c

Explanation: Bhakti movement in Maharashtra began in the late 13th century. Its proponents were known as the Varkaris. Among its most popular figures were Jnanadev (1275-96), Namdev (1270-50) and Tukaram (1608-50), who have left behind many verses that embody the essence of Bhakti. The following table shows the chronology of bhakti saints in Maharashtra with their work of importance:

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Time Period	Bhakti Saint	Work of Importance
1271-1296	Jnanadeva	Wrote a long commentary on the Bhagavad Gita called Bhavartha Deepika
1270-1350	Namdev	Founded the Varkari cult
1533-1599	Eknath	Wrote a commentary on Ramayana called Bhavvratha Ramayana
1598-1650	Tukaram	Wrote devotional poems known as Abhangas. So, option c is correct.
1608-1681	Ramdas	Dasabodha is the compilation of his writings and sermons.

Therefore, the correct answer is c.

Q86. Answer: d

Explanation: The 10th century CE marks important changes in the realm of ideas and beliefs in the Islamic religion with the rise of the Sufi mystic orders. The core concept of Sufi Movement is Wahdat-ul-wujud, meaning "Unity of being". It outwardly rejected the religion and emphasized love and devotion to God and compassion towards all fellow human beings.

The Sufi orders are broadly divided into two: Ba-Shara – Those who followed the Islamic Law and Be-Shara – Those who were not bound by the Islamic Law.

The four main Sufi orders in India – Chisti, Qadiriyya, Suhrawardiyya and Naqshbandi order were practised in India; the following table shows the founder of important Sufi orders in India.

Sufi Sisilahs Practised in India	Founders
Chishti Order	Khwaja Muinuddin Chishti
Suhrawardi Order	Bahauddin Zakariya
Naqshbandi Order	Baqi Billah

Therefore, the answer is d.

Q87. Answer: d

Explanation: Sufism or tasawuf is the name for various mystical movements in Islam. It aims to establish direct communion between God and man through personal experience of the mystery that lies within Islam. Every religion gives rise to mystical tendencies in its fold at a particular stage of its evolution. In this sense, Sufism was a natural development within Islam based on the spirit of Quranic Piety.

The Sufis, while accepting the Sharia, did not confine their religious practice to formal adherence and stressed cultivation of religious experience aimed at a direct perception of God. Sufism stressed the elements of love and devotion as an effective means of the realization of God. Love of God meant love of humanity, and so the Sufis believed service to humanity was tantamount to service to God. In Sufism, self-discipline was considered an essential condition to gain knowledge of God with a sense of perception. **So, statement (1) is correct.**

While orthodox Muslims emphasise external conduct, the Sufis lay stress on inner purity and consider love and devotion as the only means of attaining salvation. According to Sufis, one must have the guidance of a Pir or Guru, without which spiritual development is impossible. **So, statement (2) is correct.**

Other ideas emphasised by Sufism are meditation, good actions, repentance for sins, the performance of prayers and pilgrimages, fasting, charity and suppression of passions by ascetic practices.

Therefore, the answer is d.

Q88. Answer: b

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Explanation: The history of Asoka is reconstructed on the basis of his inscriptions. These inscriptions numbering 39 are classified into Major Rock edicts, Minor Rock edicts, Separate Rocks, Major Pillar Edicts and Minor Pillar Edicts. These were composed in Prakrit and written in Brahmi script in the greater part of the subcontinent. But in its western part they appeared in Arabic language and Kharosthi script and in Afghanistan they were written in both Arabic and Greek scripts and languages. **So, statement (1) is not correct.**

James Prinsep was the first person who deciphered the script in 1837 and identified Asoka as the king referenced as Devanampiya Piyadassi ("Beloved of the Gods") in the edicts. **So, statement (2) is correct.**

Therefore, the correct answer is b.

Q89. Answer: a

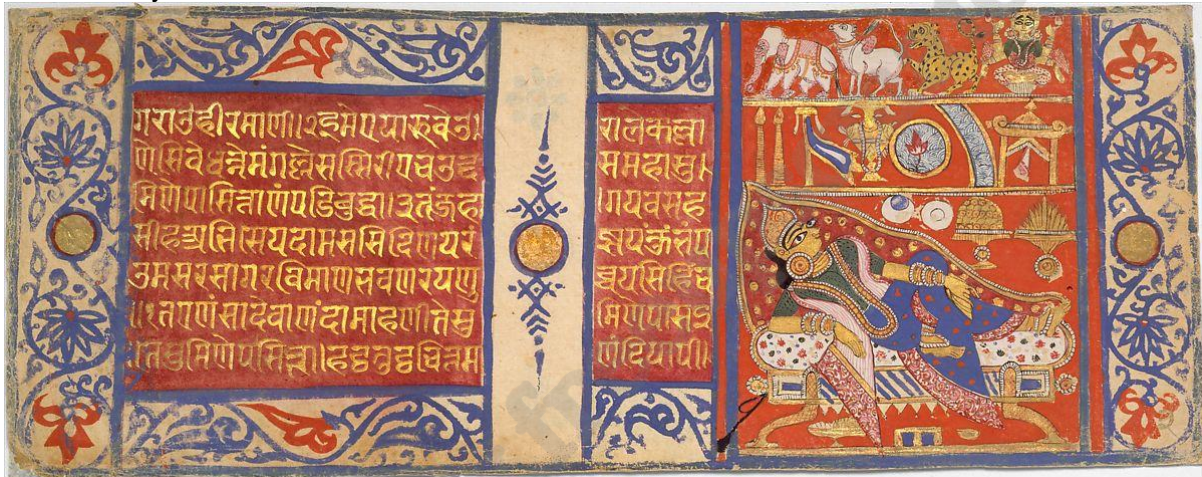
Explanation: The Bhattiprolu script is a variant of the Brahmi script which has been found in old inscriptions at Bhattiprolu, a small village in Guntur district, Andhra Pradesh, South India. The inscriptions date to between the 3rd and 1st centuries BCE, putting them among the earliest evidence of Brahmi writing in South India. The script was written on the urn containing Buddha's relics. It differs from the Ashokan Brahmi script.

Therefore, the correct answer is a.

Q90. Answer: d

Explanation: The Kalpsutra is a Jain text containing the biographies of the Jain Tirthankaras, notably Parshvanatha and Mahavira. Traditionally ascribed to Bhadrabahu, it was probably put in writing 980 or 993 years after the Nirvana of Mahavira.

This Sutra contains detailed life histories and, from the mid-15th century, was frequently illustrated with miniature painting. The oldest surviving copies are written on paper in western India in the 14th century.



Therefore, the correct answer is d.

Q91. Answer: b

Explanation: Buddhacharita, a poetic narrative of the life of the Buddha was written by the Sanskrit poet Ashvaghosha, one of the finest examples of Buddhist literature. The author, who lived in northern India in the 1st–2nd century CE, created a loving account of the Buddha's life and teachings. He adorned the court of Kanishka. **So, pair (1) is correctly matched.**

The Harshacharita (The deeds of Harsha), is the biography of Indian Emperor Harsha by Banabhatta, also known as Bana, who was a Sanskrit writer of seventh-century CE India. **So, pair 2 is not correctly matched.**

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Mahaviracharita is a play by the 8th-century Sanskrit playwright of Bhavabhuti based on the early life of Rama, the hero of the Ramayana and venerated as a Hindu deity. **So, pair 3 is correctly matched. Therefore, the correct answer is b.**

Q92. Answer: d

Explanation: Harisena was the court poet of Samudragupta, who mentioned his achievements in the Prayag-Prasasti inscription (or Allahabad Pillar inscription). **So, pair (1) is correctly matched.**

The achievements of Gutamiputra Satkarni were mentioned in Nasik Inscription that was composed by his mother Gautami Balasri. The Nasik Prasasti describes Gautamiputra as the ruler of the Aparanta, Anupa, Saurashtra, Kukura, Akara and Avanti; who defeated the Saka King Nahapana and restored the prestige of his dynasty by reconquering a large part of the former dominions of the Satavahanas. **So, pair (2) is not correctly matched.**

The Junagadh rock inscription of Rudradaman, also known as the Girnar Rock inscription of Rudradaman, is a Sanskrit prose inscribed on a rock by the Western Satraps ruler Rudradaman I. It is located near Girnar hill near Junagadh, Gujarat, India. The inscription is dated shortly after 150 CE. **So, pair (3) is not correctly matched.**

The Mandsaur Pillar Inscriptions of Yasodharman are a set of Sanskrit inscriptions from early 6th-century discovered at an archaeological site at the village of Sondani, south of Mandsaur (Mandasor) in northwestern Madhya Pradesh, India. These record the victory of Aulikara king Yasodharman over the Hun king Mihirakula. **So, pair (4) is correctly matched. Therefore, the correct answer is d.**

Q93. Answer: a

Explanation: Kalidas was the court poet of Chandragupta Vikramaditya II. He was a great poet and dramatist, also considered as Shakespeare of the East.

Raghuvamsham is a Sanskrit mahakavya by Kalidasa. It narrates the stories related to the Raghu dynasty, namely the family of Dilipa and his descendants up to Agnivarna, who include Raghu, Dasharatha and Rama. **So, the statement (1) is correct.**

Ritusamhara, a long poem in Sanskrit is attributed to Kalidasa. The poem has six cantos (major divisions in an epic/poem) for the six Indian seasons- grishma (summer), varsha (monsoon/rains), sharat (autumn), hemanta (cool), shishira (winter), and vasanta (spring). It is considered to be Kalidasa's earliest work. **So, the statement (2) is not correct.**

Therefore, the correct answer is a.

Q94. Answer: d

Explanation: The Arthashastra is an Indian treatise on politics, economics, military strategy, the function of the state, and social organization attributed to the philosopher and Prime Minister Kautilya (also known as Chanakya, Vishnugupta, I. c. 350-275 BCE) who was instrumental in establishing the reign of the great king Chandragupta Maurya (r. c. 321-c.297 BCE), founder of the Mauryan Empire (322-185 BCE). It was written in 3rd century BCE. Mahabhasya (great commentary), attributed to Patanjali, is a commentary on selected rules of Sanskrit grammar from Panini's Ashtadhyayi. It is dated to the 2nd century BCE. Kiratarjuniya is an epic poem by Bharavi, considered to be the most powerful poem in Sanskrit. Believed to have been composed in the 6th century CE or earlier, it consists of eighteen cantos describing the combat between Arjuna and Lord Shiva at Indrakeeladri Hills in present-day Vijayawada.

Kadambari is a romantic novel in Sanskrit. It was substantially composed by Banabhatta in the first half of the 7th century CE, who did not survive to see it through completion. The novel was completed by Banabhatta's son Bhushanabhatta, according to the plan laid out by his late father. **Therefore, the correct answer is d.**

Q95. Answer: c

Explanation: Sangam assemblies were organised under the kingdom of Pandya where poets, bards and writers flocked from various parts of South India. The literature produced in the duration of these assemblies was called Sangam literature.

There were three major Sangam organised:

1. The first Sangam assembly took place in Madurai under the chairmanship of Agastya. No literary work has survived from this.
2. The second assembly took place in Kapatapuram initially under Agastya and then by his disciple Tolkappiyar. Tolkappiyam is the only literature that survived.
3. The third Sangam assembly took place in Madurai under the chairmanship of Nakkirar when most of the existing corpus of Sangam literature was written. **So, statements (1) and (2) are not correct.**

Pathinenkilkanakku contains eighteen works about ethics and morals. The most important among these works is Tirukkural authored by Thiruvalluvar, the great Tamil poet and philosopher. **So, statement (2) is correct. Therefore, the correct answer is c.**

Q96. Answer: d

Explanation: Silappathikaram, ("The Jeweled Anklet") the earliest epic poem in Tamil, written in the 5th–6th century AD by Prince Ilango Adikal. Its plot is derived from a well-known story. It tells of the young merchant Kovalan's marriage to the virtuous Kannaki (Kannagi), his love for the courtesan Matavi, and his consequent ruin and exile in Madurai.

Therefore, the correct answer is d.

Q97. Answer: c

Explanation: Hala was the 17th king in the line in the Satvahana dynasty. He was also a great poet who authored the Gathasattasai. It is a collection of 700 poems on love and its various themes in the Maharashtri Prakrit dialect. **So, both statements (1) and (2) are correct.**

Therefore, the correct answer is c.

Q98. Answer: c

Explanation: Kannada language has many great scholars, among them Ratnatraya or the three gems remains unparalleled. The Ratnatraya consisted of three poets called

- Pampa
- Ponna
- Ranna

Pampa was better known as the father of Kannada and wrote two great poetic work Aadi Purana and Vikramjeev Vijaya. **So, statement (1) is correct.**

Ponna wrote a very famous treaty titled Shanti Purana. **So, statement (2) is correct.**

Therefore, the correct answer is c.

Q99. Answer: d

Explanation: Classical Sanskrit –

The term 'classical Sanskrit' refers to the language whose rules were codified by the 5th/4th century BCE grammarian Panini in his Ashtadhyayi. Another important Sanskrit grammar is Patanjali's Mahabhashya (2nd century BCE). Mahabharata and Ramayana are written in classical Sanskrit. **So, all the statements are correct.**

Sanskrit is the only language that transcended the barriers of region and boundaries from north to south, and from east to west, no part in India has not contributed to or been affected by the Sanskrit language.

Therefore, the correct answer is d.

Q100. Answer: c

Explanation: In Jainism, Samavasarana is the divine preaching hall of the Tirthankara. The word samavasarana is derived from two words, 'sama', meaning general and 'avasara', meaning opportunity.

Sittanavasal Cave is a 2nd-century Jain complex of caves in Sittanavasal village in Pudukottai district of Tamil Nadu, India. They are an example of rock-cut architecture based on Jain thought and ideologies. Its name is a distorted form of Sit-tan-na-va-yil, a Tamil word which means "the abode of great saints" (Tamil). This scene shows Samava-sarana – a unique, chosen and elegant audience hall where Tirthankaras gave sermons after they reached realisation (kevala-gnana). Bulls, elephants, apsaras (angels) and other Gods gathered in this audience hall to witness this grand scene. Top columns have paintings of dancing women with lotuses whereas the southern pillars have the paintings of the king and queen with an umbrella.

Therefore, the correct answer is c.