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60 DAYS PLAN

PRELIMS 2021

COMPILATIONS

ENVIRONMENT - PART 1

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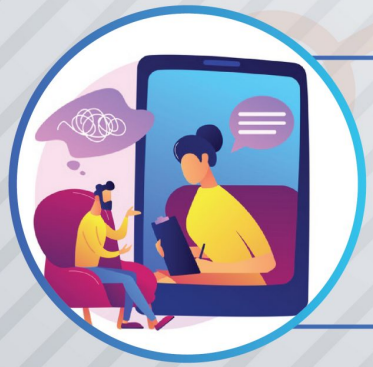

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Q.1) Consider the following statements with respect to organic farming:

1. Participatory Guarantee System (PGS) is the system of certification of organic products in India.
2. Organic farming denotes no use of fertilizers at all.
3. India has largest number of organic farmers in the world which accounts for 30 percent of all farmers in the world.

Which of the statements given above is/are correct?

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

Q.1) Solution (b)

Statements explanation

Statement 1	Statement 2	Statement 3
Correct	**Incorrect**	**Correct**
PGS-India (Participatory Guarantee System of India) is a quality assurance initiative that is locally relevant, emphasize the participation of stakeholders, including producers and consumers and operate outside the frame of third party certification.	Organic farming means avoiding all unnatural chemicals. In this process of farming, all the fertilizer and pesticide are obtained from natural sources such as bone meal or blood meal. **So, organic farming does not avoid the chemocal fertilizers at all but it uses natural fertilisers** **So statement is not correct.** According to FSSAI, 'organic farming' is a system of farm design and management to	India is home to 30 per cent of the total organic producers in the world, but accounts for just 2.59 per cent (1.5 million hectares) of the total organic cultivation area of 57.8 million hectares, according to the World of Organic Agriculture 2018 report.

	create an ecosystem of agriculture production without the use of synthetic external inputs such as chemical fertilisers, pesticides and synthetic hormones or genetically modified organisms	

Q.2) What are the mechanisms of adaptations of Halophytic (plants which grow on soils with high concentration of salts?)

1. Vivipary mode of seed germination is found in halophytes.
2. In halophytic plants, leaves are usually thin or without leaves.
3. Roots called pneumatophores with pneumathodes to get sufficient aeration are present.

Which of the statements given above is/are correct?

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

Q.2) Solution (d)

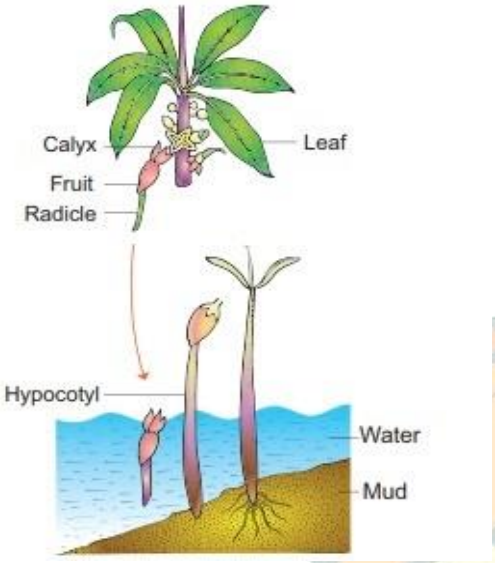
Explanation:

What are halophytes?

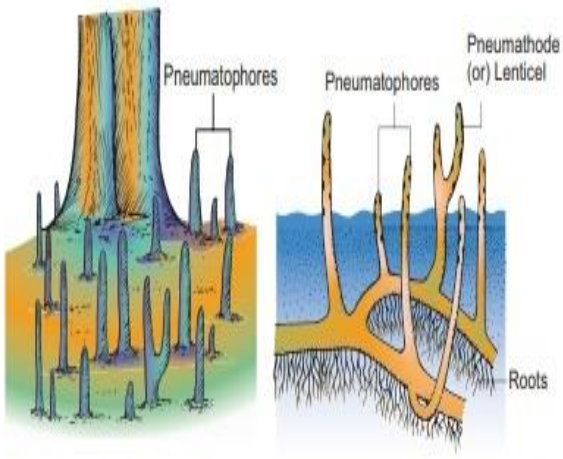
There are special type of Halophytic plants which grow on soils with high concentration of salts. Examples: Rhizophora, Sonneratia and Avicennia.

Halophytes are usually found near the sea-shores and Estuaries. The soils are physically wet but physiologically dry. As plants cannot use salt water directly they require filtration of salt using physiological processes. This vegetation is also known as mangrove forest and the plants are called mangroves.

Adaptation methods



Vivipary mode of germination



Pneumatophores of halophytes

Statement 1	Statement 2	Statement 3
Correct	**Incorrect**	**Correct**
Seeds germinate in the fruits of mother plant itself (Vivipary). Vivipary mode of seed germination is found in halophytes.	Leaves are usually thick, entire, succulent and glossy. Some species are aphyllous (without leaves). So statement 2 is Incorrect. The leaves may be dorsiventral or isobilateral with salt secreting glands.	A special type of negatively geotropic roots called pneumatophores with pneumathodes to get sufficient aeration are present. They are called breathing roots. Example: Avicennia

Q.3) Consider the following pairs:

Terms	Meaning
1. Population	Includes all the populations occupying a given area.
2. Community	Organisms of the same species that are in proximity to one another.
3. Biome	Large regional or sub continental ecosystem characterized by similarity in climate and vegetation.

Which of the pairs given above is/are correct?

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

Q.3) Solution (b)

Explanation

Pair 1	Pair 2	Pair 3
Incorrect	**Incorrect**	**Correct**
Population	**Community**	**Biome**
It refers to the organisms of the same species that are in proximity to one another. For example a group of rabbits.	It includes all the populations occupying a given area. The size of a community depends on our scale of reference.	It refers to large regional or sub continental ecosystem characterized by similarity in climate and vegetation. It is made of many similar ecosystem.

	We might use Community to refer to all of the living things in a particular area like a pond or we might restrict our interest to the fish community or the plant	

Q.4) Consider the following pairs:

Terms	Meaning
1. Amensalism	One species benefits, while the other species (the host) is neither harmed nor inhibited.
2. Commensalism	Interaction is favourable to both species.
3. Competition	Beneficial to one species and harmful to the other species.

Which of the pairs given above is/are correct?

a) 2 and 3 only
b) 1 and 3 only
c) 1,2 and 3
d) None of the above

Q.4) Solution (d)

Explanation

Different biological interactions

Mutualism: both species benefit.

- Example: in pollination mutualism is seen, the pollinator gets food (pollen, nectar), and

the plant has its pollen transferred to other flowers for cross-fertilization (reproduction).
Commensalism: one species benefits, the other is unaffected. • Example: Cow dung provides food and shelter to dung beetles. The beetles have no effect on the cows.
Competition: both species are harmed by the interaction. • Example: If two species eat the same food, and there isn't enough for both, both may have access to less food . They both suffer a shortage of food
Predation and parasitism: one species benefits, the other is harmed. • Example: Parasitism: tick gains benefit by sucking blood; host is harmed by losing blood.
Amensalism: One species is harmed, the other is unaffected. • Example: A large tree shades a small plant, retarding the growth of the small plant. The small plant has no effect on the large tree.
Neutralism: There is no net benefit or harm to either species.

Q.5) Which of the following statements are correct about the invasive species?

1. An invasive species is a non-native organism that causes ecological harm after being introduced to a new environment.
2. Invasive species can cause extinction of endogenic species.
3. Invasive species are always a predator which reduces population of local species.

Select the code from below:

a) 1 and 2
b) 2 and 3
c) 1 and 3
d) All of the above

Q.5) Solution (a)

Invasive Species

- An invasive species is a non-native organism that causes ecological harm after being introduced to a new environment.
- Once they enter a new ecosystem, they can outcompete native organisms for resources like food, especially if they lack natural predators.
- Some invasive species also carry diseases that kill native organisms and many will consume native plants and animals. Invasive species can ultimately cause the decline or extinction of native species, decreasing biodiversity in an ecosystem.
- Humans are responsible for the spread of a majority of earth's invasive species, often carrying them to different parts of the world on ships.
- Invasive species are not necessarily predating.

Q.6) Nitrogen fixation on the earth is facilitated by various processes like –

1. By microorganisms
2. Artificially using industrial processes
3. By Atmospheric processes like thunder and lighting

Which of the statements given above is/are correct?

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

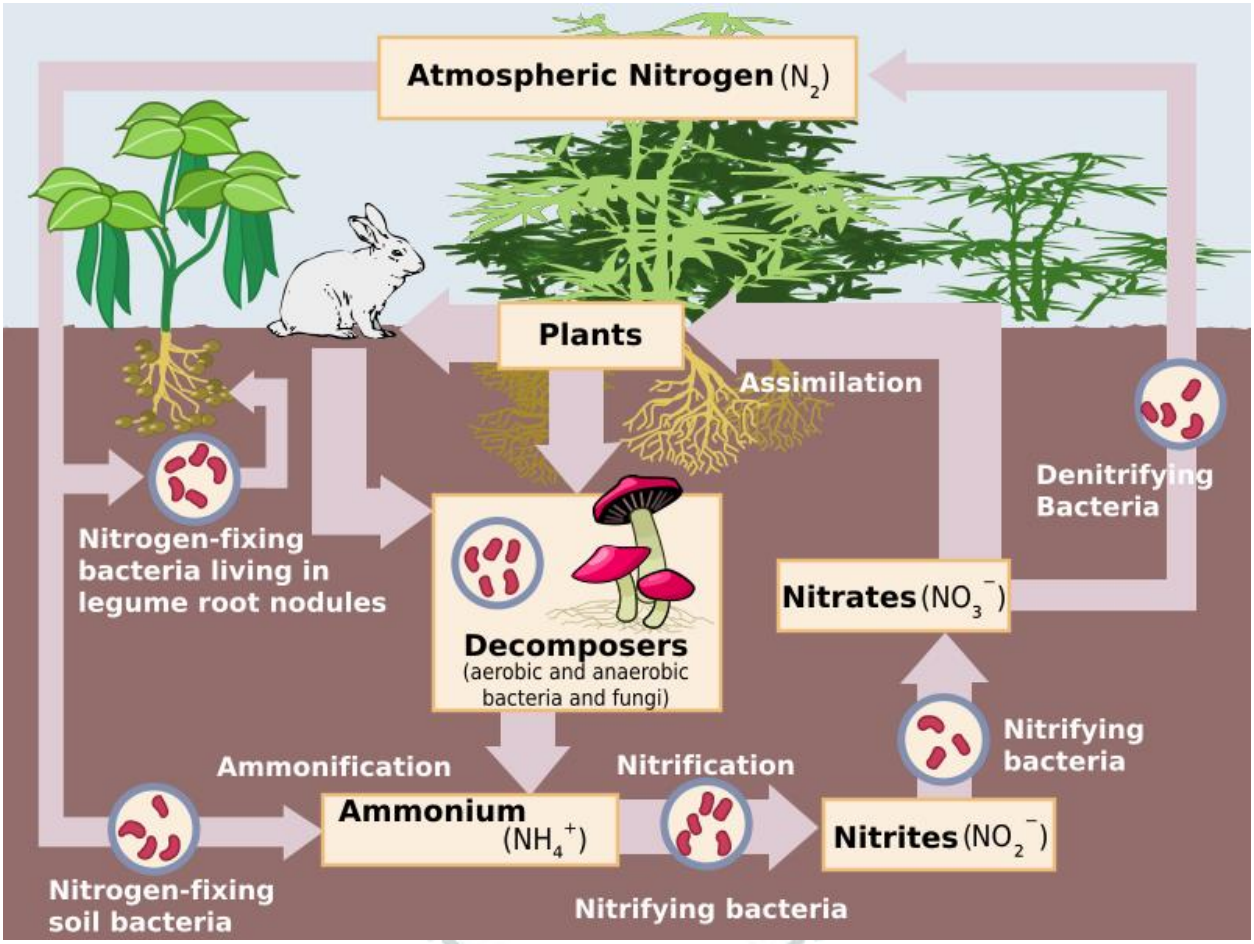
Q.6) Solution (d)

Explanation

Statement 1	Statement 2	Statement 3
Correct	Correct	Correct
Biological Fixation	Industrial Fixation	Atmospheric Fixation

The ability to fix nitrogen is found only in certain bacteria and archaea. Some live in a symbiotic relationship with plants of the legume family (e.g., soybeans, alfalfa). Some establish symbiotic relationships with plants other than legumes (e.g., alders). Some establish symbiotic relationships with animals, e.g., termites and "shipworms" (wood-eating bivalves). Some nitrogen-fixing bacteria live free in the soil. Nitrogen-fixing cyanobacteria are essential to maintaining the fertility of semi-aquatic environments like rice paddies. Biological nitrogen fixation requires a complex set of enzymes and a huge expenditure of ATP. Although the first stable product of the process is ammonia, this is quickly incorporated into protein and other organic nitrogen compounds.	Under great pressure, at a temperature of 600°C, and with the use of a catalyst, atmospheric nitrogen and hydrogen (usually derived from natural gas or petroleum) can be combined to form ammonia (NH_3). Ammonia can be used directly as fertilizer, but most of it is further processed to urea and ammonium nitrate (NH_4NO_3).	The enormous energy of lightning breaks nitrogen molecules and enables their atoms to combine with oxygen in the air forming nitrogen oxides. These dissolve in rain, forming nitrates that are carried to the earth. Atmospheric nitrogen fixation probably contributes some 5–8% of the total nitrogen fixed.

Diagram explaining nitrogen fixation



Q.7) Consider the following statements with respect to Ecological Succession?

1. Primary succession is relatively faster as compared to secondary succession.
2. Succession would occur faster in area existing on the bank of the large continent because of existence of more humidity in the soil.
3. Ecological succession leads to the establishment of a relatively stable climax community.

Which of the statements given above is/are correct?

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

Q.7) Solution (c)

Statements explanation

Statement 1	Statement 2	Statement 3
Incorrect	**Incorrect**	**Correct**
As secondary succession starts on a well-developed soil already formed at the site. Thus secondary succession is relatively faster as compared to primary succession which may often require hundreds of years. **So statement 1 is wrong**.	**Succession would occur faster in area existing in the middle of the large continent.** **So statement 2 is incorrect**. This is because, here all propagules or seeds of plants belonging to the different seres would reach much faster, establish and ultimately result in climax community	Succession is a universal process of directional change in vegetation, on an ecological time scale. Succession is a progressive series of changes which leads to the establishment of a relatively stable climax community. **So statement 3 is correct.** Succession occurs when a series of communities replace one another due to large scale destruction either natural or manmade. This process continues - one community replacing another community, until a stable, mature community develops.

Q.8) Consider the following statements about the ecotone:

1. It defines a unique functional role or place of a species in an ecosystem.
2. Mangrove forests can be considered as an example of ecotone.
3. Ecotone will have larger population densities than the communities on either side.

Which of the statements given above is/are correct?

a) 1 and 2 only

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

Q.8) Solution (b)

Explanation

Statement 1	Statement 2	Statement 3
Incorrect	**Correct**	**Correct**
A niche is the unique functional role or place of a species in an ecosystem not Ecotone. **So, statement 1 is incorrect.**	Mangrove forests are the best example for represent an Ecotone between marine and terrestrial ecosystem. Other Examples are – grassland, estuary and river bank.	Ecotone often has a large number of species and larger population densities than the communities on either side.

Q.9) Consider the following statements with respect to Adaptations:

1. Aestivation takes place during times of heat and dryness only by terrestrial animals.
2. Hibernation is the type of winter sleep characterized by lower body temperature, slower breathing, and lower metabolic rate.

Which of the following statement given above is/are correct?

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

Q.9) solution (b)

Explanation

Aestivation

Aestivation is a state of animal dormancy, characterized by inactivity and a lowered metabolic rate that is entered in response to high temperatures and arid conditions. It takes place during times of heat and dryness, the hot dry season, which is often but not necessarily the summer months. Invertebrate and vertebrate animals are known to enter this state to avoid damage from high temperatures and the risk of desiccation. Both terrestrial and aquatic animals undergo aestivation.

Hibernation

Hibernation is a state of inactivity and metabolic depression in animals, characterized by lower body temperature, slower breathing, and lower metabolic rate. Hibernating animals conserve food, especially during winter when food supplies are limited, tapping energy reserves, body fat, at a slow rate. It is the animal's slowed metabolic rate which leads to a reduction in body temperature and not the other way around.

Q.10) Consider the following statements about Phytoplankton

1. They contribute more than half of the oxygen in the environment.
2. They reduce global warming by absorbing human-induced carbon dioxide
3. They are not found in freshwater systems.

Which of the following statements given above is/are correct?

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

Q.10) solution (a)

Explanation

Phytoplanktons are tiny microscopic floating plants found in water bodies.

Significance of Phytoplanktons:

- They contribute more than half of the oxygen in the environment.
- They reduce global warming by absorbing human-induced carbon dioxide.
- They also serve as the base of the ocean food chain.

- They are important bio indicators regulating life in oceans. Their abundance determines the overall health of the ocean ecosystem.
- They are found in all such water systems, including marine or brackish or fresh. About 1% of the global biomass is due to phytoplankton.

Q.11) Consider the following statements and identify the incorrect statement with respect to the food chain:

a) Detritus food chain releases energy into the ecosystem whereas grazing food chain utilizes energy from the ecosystem.
b) Detritus food chain helps in fixing inorganic nutrients.
c) Detritus food chain is usually smaller compared to the grazing food chain.
d) Energy for the grazing food chain is obtained directly from the sunlight.

Q.11) Solution (a)

Explanation

Grazing food chain	Detritus food chain
In this food chain, producers serves as the primary source of energy and constitute the first trophic level.	In this food chain, dead and decaying matter serves as the primary source of energy. Detritivores or decomposers feed on this matter and releases the nutrients back into the atmosphere.
Energy for the grazing food chain is obtained directly from the sunlight.	Energy for the detritus food chain is obtained from the organic debris
Grazing food chain releases energy into the ecosystem.	Detritus food chain utilizes energy from the ecosystem.
Grazing food chain helps in adding energy.	Detritus food chain helps in fixing inorganic nutrients.

Grazing food chain involves all macroscopic organisms.	Detritus food chain involves subsoil organisms, which can be macroscopic or microscopic.

Q.12) Consider the following statements with respect to mangrove ecosystem in India:

1. Gujarat has the highest percentage of area under total mangrove cover among the state and UTs.
2. The mangrove cover in India is 5% of the country's total geographical area.
3. India State of Forest Report, 2019 reports a decrease of 54 sq. km in mangrove cover from the previous assessment.

Which of the statements given above is/are incorrect?

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

Q.12) solution (b)

Statements Explanation

Statement 1	Statement 2	Statement 3
Incorrect	**Incorrect**	**Incorrect**
Among the states and UTs, West Bengal has the highest percentage of area under total Mangrove cover followed by Gujarat and Andaman Nicobar Islands.	The mangrove cover in India is 4,975 sq. km, which is 0.15% of the country's total geographical area.	It reports Increase in the mangrove cover as compared to 2017 assessment of 54 sq. km.

Q.13) Which of the following statement best reflects the meaning of ecology?

a) Structural and functional unit of biosphere interacting and exchanging materials between them.
b) The sum total of living, non-living components; influences and events, surrounding an organism
c) Large areas of the Earth's surface within which organisms have been evolving over long periods of time.
d) Study of the relationship of the living organisms with each other and with their environment.

Q.13) Solution (d)

Explanation

Statement 1	Statement 2	Statement 3	Statement 4
Ecosystem	**Environment**	**Ecozones**	**Ecology**
An ecosystem is defined as a structural and functional unit of biosphere consisting of community of living beings and the physical environment, both interacting and exchanging materials between them. It includes plants, trees, animals, fish, birds, micro-organisms, water, soil, and people.	Everything that surrounds or affects an organism during its life time is collectively known as its environment. The environment is defined as 'the sum total of living, non-living components; influences and events, surrounding an organism.	Ecozones delineate large areas of the Earth's surface within which organisms have been evolving in relative isolation over long periods of time, separated from one another by geographic features, such as oceans, broad deserts, or high mountain ranges, that constitute barriers to migration.	Ecology is defined "as a scientific study of the relationship of the living organisms with each other and with their Environment." It deals with the ways in which organisms are molded by their environment, how they make use of environmental resources including energy flow and mineral cycling.

Q.14) With reference to the marine organisms, consider the following statements:

1. Kelp forests are underwater forests that thrive well in cold, nutrient rich waters.
2. Kelp forests are always coastal and require shallow, relatively clear water.
3. They represent the highest rates of primary production of any natural ecosystem on Earth.

Which of the statements given above is/are correct?

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

Q.14) solution (d)

Basic Information

About Kelp Forests

- Kelp forests are underwater forests that thrive well in cold, nutrient rich waters.
- Kelps are large brown algae seaweeds attached to the seafloor and eventually grow to the water's surface and rely on sunlight to generate food and energy.
- These forests are always coastal and require shallow, relatively clear water.
- These forests harbor a greater variety and higher diversity of plants and animals than almost any other ocean community.
- In regions with cold, nutrient-rich water, they can attain some of the highest rates of primary production of any natural ecosystem on Earth.
- Kelp forests have been observed throughout the Arctic by Inuit, researchers and polar explorers. The Canadian Arctic alone represents 10 per cent of the world's coastlines.

Q.15) Consider the following statements about the energy pyramid:

1. Energy pyramid can be both upward and downward.
2. Under pyramid of biomass individuals in each trophic level are counted instead of being weighted.
3. Pyramid of number will always be upright.

Which of the statements given above is/are incorrect?

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

Q.15) Solution (c)

Explanation

Statement 1 **(Incorrect)**	**Statement 2** **(Incorrect)**	**Statement 3** **(Incorrect)**
Pyramid of energy	**Pyramid of Biomass**	**Pyramid of number**
To compare the functional roles of the trophic levels in an ecosystem, an energy pyramid is most suitable. An energy pyramid reflects the laws of thermodynamics, with conversion of solar energy to chemical energy and heat energy at each trophic level and with loss of energy being depicted at each transfer to another trophic level. Hence the pyramid is always upward, with a large energy base at the bottom. **So, statement 1 is wrong.**	In Pyramid of Biomass individuals in each trophic level are weighed instead of being counted. This gives us a pyramid of biomass, i.e., the total dry weight of all organisms at each trophic level at a particular time. **So, statement 2 is also wrong.**	It is a graphic representation of the total number of individuals of different species, belonging to each trophic level in an ecosystem. Depending upon the size and biomass, the pyramid of numbers may not always be upright, and may even be completely inverted. So statement 3 is also wrong.

Q.16) Which of the following can be possible cause of the coral bleaching?

1. Increased sedimentation in the ocean water

2. Increased level of carbon dioxide in the ocean water
3. Overfishing

Choose correct code:

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

Q. 16) Solution (c)

Explanation

When corals are stressed by changes in conditions such as temperature, light, or nutrients, they expel the symbiotic algae living in their tissues, causing them to turn completely white. There are various reasons for the coral bleaching like:

- Increased (most commonly due to global warming), or reduced water temperature.
- Oxygen starvation caused by an increase in zooplankton levels as a result of overfishing.
- Increased solar irradiance (photosynthetically active radiation and ultraviolet light.
- Changes in water chemistry (in particular acidification caused by CO_2 pollution)
- Increased sedimentation (due to silt runoff)
- Bacterial infections; Changes in salinity; Herbicides; Low tide and exposure; Cyanide fishing.
- Overfishing resulting in the disturbance of optimal condition for the growth of corals.

Q.17) Consider the following statements with respect to Phosphorus cycle in an ecosystem:

1. Phosphorus cycle is part of the gaseous cycle.
2. The largest reservoir of the phosphorus in the biosphere is the atmosphere.

Which of the statements given above is/are correct?

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

Q.17) solution (d)

Explanation

Phosphorus cycle

Phosphorus plays a central role in aquatic ecosystems and water quality. Unlike carbon and nitrogen, which come primarily from the atmosphere, phosphorus occurs in large amounts as a mineral in phosphate rocks and enters the cycle from erosion and mining activities. The largest reservoir of the Phosphorus in the biosphere is the mineral rocks.

By the process of weathering and erosion phosphates enter rivers and streams that transport them to the ocean. In the ocean once the phosphorus accumulates on continental shelves in the form of insoluble deposits. After millions of years, the crustal plates rise from the sea floor and expose the phosphates on land. After more time, weathering will release them from rock and the cycle's geochemical phase begins again.

Q.18) Which of the following are the effects of Eutrophication?

1. Shifting in various species component as well as habitat of an ecosystem.
2. The decrease in water transparency and turbidity.
3. Decreased biomass of algae.
4. Growth of coral reefs.

Choose correct answer:

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

Q.18) solution (a)

Explanation

Statement 1	Statement 2	Statement 3	Statement 4
Correct	Correct	Incorrect	Incorrect

Eutrophication results in other effect known as the bottom-water hypoxia, which enhances water acidification and altering biogeochemical processes. The hypoxia conditions in bottom waters cause escape of sensitive demersal and other benthic fishes, mortality of bivalves, echinoderms and crustaceans, and extreme loss of benthic diversity.	One of the main environmental effects of eutrophication is increase of suspended particles and decrease of water clarity.	Eutrophication results in the large scale algal bloom rather than decrease in the biomass of Algae. It results into extensive macro algal blooms.	Eutrophication disturbs the optimal condition required for the growth of coral reefs like clear water little pollution nutrient poor water etc.

Q.19) In an Aquatic ecosystem arrange the following in terms of decreasing productivity (Highest first to lowest last)

1. Estuaries
2. Open ocean
3. Continental shelf
4. Lakes and streams

Which of the following option is correctly arranged?

a) 1, 3, 2, 4
b) 2, 1, 3, 4
c) 1, 4, 3, 2
d) 4, 1, 2, 3

Q.19) solution (c)

Explanation

The correct order of decreasing productivity in an aquatic ecosystem is :

1. Estuaries (Most productive)
2. Lakes and streams
3. Continental shelf
4. Open ocean (Least productive)

Q.20) consider the following statements with respect to the movements of pollutants in the organisms.

1. In Bio-magnification there is a decrease in concentration of a pollutant from one link in a food chain to another.
2. Bio-magnification refers to an increase in concentration of a pollutant from the environment to the first organism in a food chain.

Which of the statements given above is/are correct?

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

Q.20) solution (d)

Basic Information

Biomagnification

- Biomagnification refers to the tendency of pollutants to concentrate as they move from one trophic level to the next.
- In order for Biomagnification to occur, the pollutant must be: long-lived, mobile, soluble in fats, biologically active

Statements analysis:

Statement 1	Statement 2

Incorrect	Incorrect
An increase in concentration of a pollutant from the environment to the first organism in a food chain is called Bioaccumulation not Biomagnification.	In Biomagnification there is an increase in concentration of a pollutant from one link in a food chain to another.

Q.21) Consider the following statements with respect to comparison between Ecosystem and Biome:

1. Biome has large geographical area while Ecosystem has small area.
2. Ecosystem contains large number of biome within it.
3. All the animals and organism in ecosystem may interact with each other while this is not the case with biome.

Which of the statements given above is/are correct?

a) 1 and 2 only
b) 1 and 3 only
c) 2 and 3 only
d) All of the above

Q.21) Solution (b)

Statements explanation

Statement 1: A biome is a region of vegetation and the associated animal community that has developed in response to climatic and other abiotic factors such as temperature, precipitation such as rainfall, and latitude. An ecosystem is the group of plants, animals and environmental factors that all interact with each other in a specific area. Geographically Biome covers larger area while ecosystem cover small area. Example of an ecosystem can be a single pond or coral reef while example for biome is tropical rain forest, Tundra biome etc. **So statement 1 is correct.**

Statement 2: **Biome is a larger category of ecological units. It contains multiple ecosystems within it**, while ecosystem is a part of biome and made of biotic and abiotic factors. **So statement 2 is incorrect.**

Statement 3: Animal species that are found in a biome do not all necessarily have to interact, while in an ecosystem, animal species do all interact in trophic interactions of food chains and food webs. **So statement 3 is correct**

Q.22) Consider the following statements about Biome

1. Biomes are greatly influenced by latitudes.
2. Two biomes can be alike and can have same type of animals and vegetation.
3. Climate determines the boundaries between biomes and plant and species found in each of them.

Which of the following are correct statements?

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

Q.22) solution (c)

Explanation

Statement 1: **Biomes are heavily influenced by latitudes,** generally biomes at higher latitudes (further away from the equator) are cooler and drier. Closer to the equator, biomes are generally warmer and wetter, as warmer air holds more moisture than colder air. **(So, statement 1 is correct)**

Statement 2: **No two biomes are alike**. They are characterized, by distinct climate (precipitation and temperature mainly), vegetation, animal life and general soil type. **(Hence, statement 2 is incorrect)**

Statement 3: The climate determines the boundaries of a biome and abundance of plants and animals found in each one of them. **(So, statement 3 is correct)**

Q.23) Which one of the following is the correct sequence of levels of organisation in ecology?

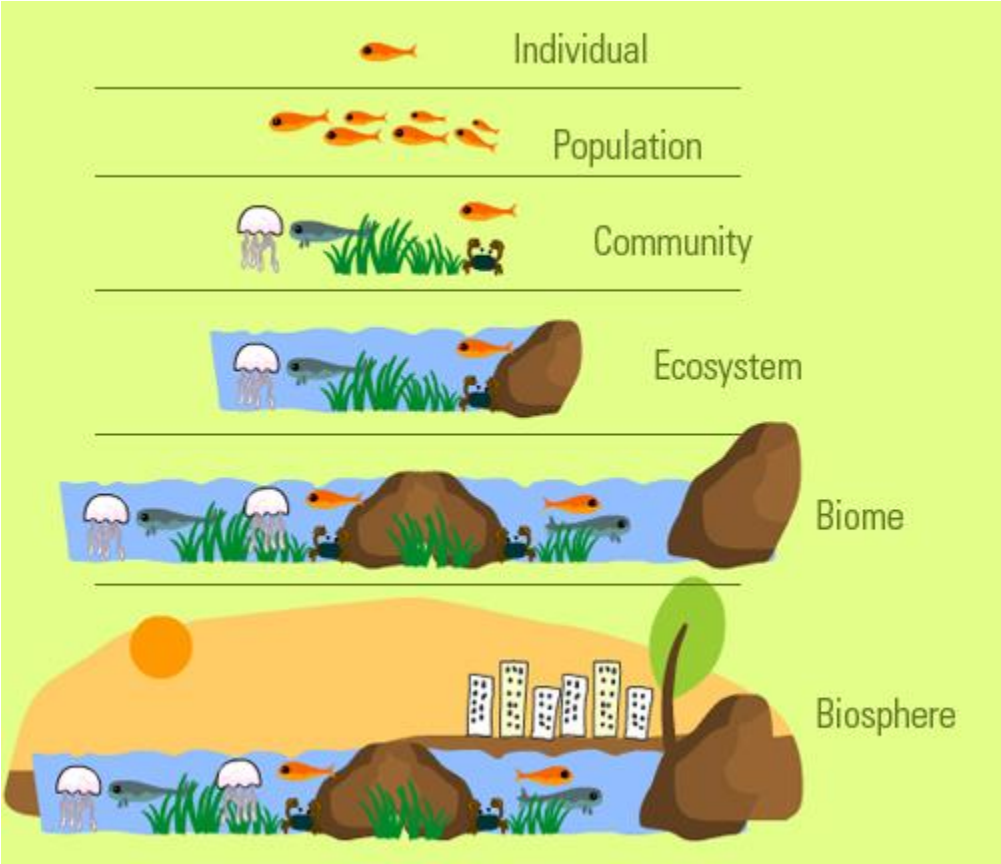
a) Ecosystem – Biome- Biosphere - Community
b) Community – Biome – Ecosystem - Biosphere
c) Community – Ecosystem – Biome - Biosphere
d) Biosphere – Community – Biome - Ecosystem

Q.23) Solution (c)

Explanation:

Levels of Ecological organisation is the study of how organisms interact with each other and with their environment.

Scientists study ecology at various levels of organisations. The correct sequence is shown in the figure given below.



Q.24) Consider the following statements regarding Tundra Biome

1. There are no trees in Tundra biome.
2. Reptiles and amphibians are almost absent there.
3. It is considered as world's largest land biome since it extends across North America and Eurasia.

Which of the above statement is/are correct?

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

d) All of the above

Q.24) Solution (a)

Explanation:

Tundra Biome

- Tundra means a "barren land" since they are found where environmental conditions are very severe. There are two types of tundra – arctic and alpine.
- Distribution: Alpine tundra occurs at high mountains above the tree line. E.g. High ranges of the Himalayas, Andes, Alps etc. while Arctic tundra extends as a continuous belt below the polar ice cap and above the tree line in the northern hemisphere. On the south pole, tundra is very small since most of it is covered by ocean
- **A defining feature of the tundra is the distinct lack of trees.** There are a variety of reasons trees don't grow in this region. First, the permafrost prevents them from taking root, then those that do manage it have shallow root systems that are not an ideal anchor to withstand the high winds. Finally, low precipitation means there is not enough water to support trees. **Hence statement 1 is correct.**
- Instead, the tundra has patchy, low-to-ground vegetation consisting of small shrubs, grasses, mosses, sedges, and lichens, all of which are better adapted to withstand tundra conditions.
- Animals like the reindeer, arctic fox, wolves, musk-ox, polar bear, lemming, arctic hare, arctic willow live in tundra region. **Reptiles and amphibians are almost absent. So, Statement 2 is correct.**

Statement 3: **Taiga or Boreal biome is considered as the world's largest biome**, since it extends across North America and Eurasia on the Southern margins of Tundra zone. **Hence, Statement 3 is incorrect.**

Q.25) Consider the following biomes and dominant flora and fauna found there.

	(Biomes)		**(Flora and Fauna)**
1.	Savanah	:	Cheetah, hyena and Grasses
2.	Tundra	:	Lichens and amphibians
3.	Desert	:	Reptiles and cacti
4.	Taiga	:	Spruce, Fir and Siberian Tiger

Which of the above pair are correctly matched?

a) 1 and 2 only
b) 2, 3 and 4 only
c) 1, 3 and 4 only
d) All of the above

Q.25) Solution (c)

Explanation:

Statement 1: Savanah is also known as tropical wet or dry biome its landscape is typified by tall grass and short trees. The fauna include a great diversity of grazers and browsers such as antelopes, buffaloes, zebras, elephants and rhinoceros; the carnivores include lion, cheetah, hyena; and mongoose, and many rodents. **Hence, statement 1 is correct**

Statement 2: In tundra biome there is trees, **amphibians or reptiles are almost absent** due to harsh conditions prevalent there. Main vegetation there is **mosses and lichens** that are sparsely found on rocks. **So, statement 2 is an incorrect match.**

Statement 3: The flora and fauna of desert are drought resistant. Animals that have adapted to a desert environment are called xerocoles. Xerocoles include species of insects, reptiles, birds, and mammals Snakes and lizards are familiar **desert reptiles**. While main plants found there are **cactus**, sagebrush etc.

Statement 4: Taiga biome is the largest among terrestrial biome on the earth. The predominant vegetation found here is an evergreen coniferous forest with species such as **spruce, fir** and pine. Fauna found in this region include **Siberian tiger**, wolverine, lynx, wolf, bear, red fox, squirrel, and amphibians like Hyla, Rana, etc.

Q.26) Consider the following statements about Desert Biome:

1. Desert humidity is usually so high that not enough water vapour exists to form clouds.
2. Animals and birds usually have long legs to keep the body away from the hot ground.
3. Atacama desert of South America is a coastal desert.

Which of the above statements is/are correct?

a) 1 and 2 only
b) 1 and 3 only
c) 2 and 3 only
d) All of the above

Q.26) Solution (c)

Explanation:

Statement 1: **Desert humidity is usually so low that not enough water vapour exists to form clouds.** Humidity is the amount of water vapour in the air. If humidity is high then it can contain lot of water vapour which will eventually lead to formation of clouds and precipitation (normally hurricanes if humidity is high) thereafter. **So, statement 1 is incorrect.**

Statement 2: Flora and fauna found in desert biome specially adapted to this biome, for example **Animals and birds found here usually have long legs** to keep the body away from the hot ground. **Hence, Statement 2 is correct.**

Statement 3: Cold ocean currents contribute to the formation of coastal deserts. Air blowing toward shore, chilled by contact with cold water, produces a layer of fog. This heavy fog drifts onto land. Although humidity is high, the atmospheric changes that normally cause rainfall are not present. A coastal desert may be almost totally rainless, yet damp with fog. **The Atacama Desert, on the Pacific shores of Chile, is a coastal desert.**

Hence, statement 3 is correct.

Q.27) With reference to Podzols, consider the following statements:

1. They are typical soil of coniferous or boreal biome.
2. They are mostly used for grazing purposes.

Choose correct option from below:

a) 1 only
b) 2 only
c) Both 1and 2
d) None of the above

Q.27) Solution (c)

Explanation:

Podzols are the typical soils of a coniferous or boreal biome. The top layer of the soil is very thin and is overlain over sandy or loamy subsurface which has no organic matter (lost due to leaching of nutrients to the bottom layers).Hence**, most Podzols are poor soils for agriculture and they are mostly used for grazing.**

Hence, both statements are correct.

Q.28) With reference to ecology, the term 'Nekton' means

a) Group of animals which are swimmers
b) Unattached organism which live at air water interface.
c) Organism found living in the bottom of water mass.
d) Organisms which remain attached to stems and leaves of rooted plants

Q.28) Solution (a)

Explanation:

Nektons are group that contains animals which are swimmers. The nektons are relatively large and powerful as they have to overcome the water currents. The animals range in size from the swimming insects (about 2 mm long) to the largest animals, the blue whale.

Oceanic nekton comprises animals largely from three clades:

- Vertebrates form the largest contribution; these animals are supported by either bones or cartilage.
- Mollusks are animals such as squids and scallops.
- Crustaceans are animals such as lobsters and crabs.

Q.29) Which of the following statements with reference to Aquatic ecosystem is incorrect?

1. Presence of large amounts of nutrients increases the water quality and increases the population of living organism in water.
2. Fresh water ecosystem has salt content higher than 20 ppt and less than 35 ppt.
3. Aquatic biomes are typically classified by vegetation types.

Choose the correct code from the given options:

a) 1 and 2 only
b) 2 and 3 only
c) 3 only
d) All of the above

Q.29) Solution (d)

Explanation:

Note: Incorrect statements are asked.

Statement 1: Presence of large amounts of nutrients in waters also causes excessive growth of planktonic (free-floating) algae, called an algal bloom which imparts a distinct colour to the water bodies. Algal blooms cause **deterioration of the water quality** and fish mortality. Some bloom-forming algae are extremely toxic to human beings and animals.

Statement 2: The **salt content of fresh water bodies is very low, always less than 5 ppt (parts per thousand).** E.g lakes, ponds, pools, springs, streams, and river.

- Marine ecosystem are water bodies containing salt concentration equal to or above that of sea water (i.e., 35 ppt or above).
- Brackish water ecosystem has salt content in between 5 to 35 ppt. e.g. estuaries, salt marshes, mangrove swamps and forests.

Statement 3: There are numerous ways to classify aquatic biomes, and often freshwater and saltwater biomes are defined separately; factors used for classification include water depth, temperature, and salinity. **The terrestrial biomes are typically classified by vegetation types,** but this method can be difficult to apply to aquatic environments, which do not have as much visible plant life. **Hence, statement 3 is correct.**

Q.30) It is the maximum numbers of individuals of a given species that an area resource can sustain indefinitely without significantly degrading those resources. It is

a) Biotic Potential
b) Carrying capacity
c) Logistics growth
d) Optimum population

Q.30) Solution (b)

Explanation:

The carrying capacity of an environment is the maximum population size of a biological species that can be sustained by that specific environment, given the food, habitat, water, and other resources available. In population ecology, carrying capacity is defined as the environment's maximal load, which is different from the concept of population equilibrium, which may be far below an environment's carrying capacity. The carrying capacity of an environment may vary for different species

Q.31) With reference to Ocean Acidification, consider the below statements:

1. As the uptake of atmospheric carbon dioxide by the ocean increases, the concentration of hydrogen ions in the ocean decreases.
2. As the uptake of atmospheric carbon dioxide by the ocean increases, the concentration of carbonate ions decreases and the pH of the oceans decreases.

Which of the statements given above is/are correct?

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

Q.31) Solution (b)

Ocean acidification is the change in ocean chemistry lowering of ocean pH (i.e. increase in concentration of hydrogen ions) driven by the uptake of carbon compounds by the ocean from the atmosphere.

As the uptake of atmospheric carbon dioxide by the ocean increases, the concentration of hydrogen ions in the ocean increases, the concentration of carbonate ions decreases, the pH of the oceans decreases and the oceans become less alkaline this process is known as ocean acidification.

Statement Analysis:

Statement 1	**Statement 2**
Incorrect	**Correct**
As the uptake of atmospheric carbon dioxide by the ocean increases, the concentration of hydrogen ions in the ocean increases.	As the uptake of atmospheric carbon dioxide by the ocean increases, the concentration of carbonate ions decreases, the pH of the oceans decreases and the oceans become less alkaline.

Q.32) Mammals of the Tundra are generally equipped with special characteristic to be protected from chilliness. Which of the following are such characteristics?

1. Large body size
2. Small tail
3. Large ear

Choose appropriate answer:

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

Q.32) solution (a)

Explanation

These animals are rather large, considering the severe environments in which they live. Greater body size confers an adaptive advantage: there is less surface area relative to volume and, therefore, less opportunity for heat to dissipate to the outside.

Other features such as Small tail and Small ear are in Mammals to avoid the loss of heat from the surface. (Hence, statement 3 is incorrect)

The body is covered with fur for insulation. Insects have short life cycles which have completed during favorable part of the year.

Q.33) Consider the below statements with reference to Eutrophication:

1. Eutrophication decreases the amount of dissolved oxygen in the water bodies.
2. The pH level of ocean increases due to Euthrophication and Acid Rain.

Which of the statements given above is/are incorrect?

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

Q.33) Solution (b)

Eutrophication is characterized by excessive plant and algal growth due to the increased availability of one or more limiting growth factors needed for photosynthesis, such as sunlight, carbon dioxide, and nutrient fertilizers.

All water bodies are subject to a natural and slow eutrophication process, human activities have accelerated the rate and extent of eutrophication through both point source discharges and non point loadings of limiting nutrients, such as nitrogen and phosphorus, into aquatic ecosystems (i.e., cultural eutrophication), with dramatic consequences for drinking water sources, fisheries,

and recreational water bodies.

Statement Analysis:

Statement 1	Statement 2
Correct	**Incorrect**
Eutrophication leads to large plankton blooms, and when these blooms collapse and sink to the sea bed the subsequent respiration of bacteria decomposing the algae leads to a decrease in sea water oxygen and an increase in CO2 (a decline in pH). In simple words, Eutrophication decreases the amount of dissolved oxygen in the water bodies.	The pH level of ocean decreases due to Euthrophication and Acid Rain. The pH level of ocean is reduced (made acidic) by following: • Increased uptake of CO2 • Eutrophication • Acid Rain **Do you know?** Addition of Calcium Oxide (CaO) increases pH level, and makes it more alkaline.

Q.34) Consider the following statements about the "Ocean Deoxygenation":

1. It means that ocean is increasingly experiencing low level of Oxygen.
2. Cooler water is one of the reasons to increase the phenomenon of Ocean Deoxygenation, as it lowers demands of Oxygen.
3. Anoxic waters increase the process of Climate change.

Which of the statements given above is/are correct?

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

Q.34) solution (b)

Explanation

Ocean Deoxygenation is the expansion of oxygen minimum zones in the world's oceans as a consequence of anthropogenic emissions of carbon dioxide. (So, Statement 1 is correct)

Causes of Deoxygenation:

- **Nutrient pollution (Eutrophication) –** Flow of waste as fertilizer, sewage, animal and aquaculture waste into sea cause excessive growth of algae, which in turn deplete oxygen as they decompose.

- **Ocean warming-driven Deoxygenation**: Warmer ocean water holds less oxygen and is more buoyant than cooler water. This leads to reduced mixing of oxygenated water near the surface with deeper waters. Warmer water also raises oxygen demand from living organisms. As a result, less oxygen is available for marine life**.(So, statement 2 is incorrect)**

Impacts:

- Decline in oxygen will affect marine ecosystems and the dependent human population.
- Consequences of ocean oxygen decline include decreased biodiversity, shifts in species distributions, displacement or reduction in fishery resources and expanding algal blooms
- Impact on Climate Change- decreasing oxygen concentrations will increase greenhouse gas emission with increased release of methane and N2O. **(So, Statement 3 is correct)**

Q.35) Wetlands (Conservation and Management) Rules, 2017 defines wetlands which will be regulated. Which of the following wetland will not be regulated under given rule?

1. River channels
2. Paddy fields
3. Some categories of Human-made water bodies
4. Protected Areas
5. Areas falling within the purview of Coastal Zone Regulation

Choose the correct option:

a) 1, 2 and 3 only
b) 2 and 3 only
c) 2, 3, 4 and 5 only
d) All of the above

Q.35) solution (d)

Explanation

According to Guidelines of MoEF&CC for implementing Wetlands (Conservation and Management) Rules, 2017 Wetlands to be regulated are:

- Wetlands designated to the List of Wetlands of International Importance under the Ramsar Convention.

- Wetlands notified under the rules by the Central Government, State Government and UT Administration.
- All wetlands, irrespective of their location, size, ownership, biodiversity, or ecosystem services values, can be notified under the Wetlands Rules, **except**
    - River channels;
    - Paddy fields;
    - certain categories of Human-made water bodies
    - Protected Areas and
    - Areas falling within the purview of Coastal Zone Regulation have been excluded from notification under the Wetlands Rules.

Q.36) Following are the given pair of wetlands and their location:

(Wetlands)	**:**	**(Location)**
1. Sarsai Nawar Jheel	:	Maharashtra
2. Keshopur-Miani Community Reserve	:	Uttar Pradesh
3. Parvati Arga Bird Sanctuary	:	Uttar Pradesh
4. Asan Conservation Reserve	:	Uttarakhand

Which of the above given pairs are correct?

a) 1 and 2 only
b) 3 and 4 only
c) 2, 3 and 4 only
d) All of the above

Q.36) solution (b)

Explanation

Recent Addition to the Ramsar Sites in India

January 2020:

- Nandur Madhameshwar, a first for Maharashtra;
- Keshopur-Miani, Beas Conservation Reserve and Nangal in Punjab;
- Nawabganj, Parvati Agra, Saman, Samaspur, Sandi and Sarsai Nawar in Uttar Pradesh.

October 2020:

- Kabartal Wetland (Bihar)
- Asan Conservation Reserve (Uttarakhand

November 2020

- Lonar lake in Maharashtra and
- Sur Sarovar, also known as Keetham lake, in Agra

December 2020: Tso Kar Wetland in Ladakh

Ramsar Sites	**Location**
Asan Conservation Reserve	Uttarakhand
Keshopur-Miani Community Reserve	Punjab
Parvati Agra Bird Sanctuary	Uttar Pradesh
Sarsai Nawar Jheel	Uttar Pradesh

Q.37) Sonneratia alba recently seen in news is related to:

a) Invasive Alien species
b) Medicinal plants of Himalayas
c) Biofuel generating exotic species
d) Type of Mangrove tree

Q.37) Solution (d)

Explanation

About Sonneratia alba

- Sonneratia alba or mangrove apple is an evergreen mangrove species found along the Maharashtra's coastline
- Sonneratia alba grow up to five feet and bear white flowers with a pink base as well as green fruits, that resemble apple and are used to make pickles.
- The flowers, which bloom at night, are pollinated by nocturnal creatures like bats.
- The species was introduced in Maharashtra and is native to Andaman Islands.
- Maharashtra became the first Indian state to declare state mangrove tree as symbol of conservation
- Maharashtra State Board for Wildlife (SBWL) cleared a proposal to declare **Sonneratia alba** as the **State mangrove tree**

Benefits:

- The move helps to enhance conservation of the salt-tolerant vegetation
- Ecological importance of mangroves and biodiversity it hosts
- Adds aesthetic value to the mangrove ecosystem

Q.38) Global Coral Reef R&D Accelerator Platform has been launched by:

a) United Nations Convention on the Law of the Sea (UNCLOS)
b) International Coral Reef Initiative (ICRI)
c) G20
d) UN Environment World Conservation Monitoring Centre

Q.38) solution (c)

The Global Coral Reef R&D Accelerator Platform is an innovative action-oriented initiative aimed at creating a global research and development (R&D) program to advance research, innovation and capacity building in all facets of coral reef conservation, restoration, and adaptation, and strengthen ongoing efforts and commitments made to enhance coral reefs conservation and their further degradation.

It was launched at The Environment Ministerial Meeting (EMM) of the G20.

Q.39) Consider the following statements about Coral Reefs:

1. They provide accurate records of Climate Change.
2. The highest density of Coral reefs in India is on its eastern coast.
3. Global Coral Reef Alliance (GCRA) is a non-for profit organization initiated by UNEP to conserve Coral Reefs.

Which of the statements given above is/are correct?

a) 1 only
b) 1 and 2 only
c) 1 and 3 only
d) All of the above

Q.39) solution (a)

Explanation

Benefits of Coral Reefs

- It support the habitats of flora and fauna in the sea.

- They are the counterpart to the tropical rain forest in terms of species diversity and biological productivity in the Ocean.
- Coral reef enables the formation of associated eco-systems which allow the formation of essential habitats, fisheries and livelihoods.
- In addition, coral reefs are climatologically important because they provide an accurate long-term record of the climate change and help in extending our knowledge of seasonal climate variability in many remote tropical oceans.

Coral Reefs in India:

- Coral reefs are present in the areas of Gulf of Kutch, Gulf of Mannar, Andaman & Nicobar, Lakshadweep Islands and Malvan.
- Coral reefs are found in zone with high salt concentration (salinity), optimal temperature and with a less siltation condition which fairly facilitate to colonize corals.. In case of high siltation and water flow, as seen in eastern coast due to many delta forming rivers, coral reef does not colonize and hardly found there. **(So, statement 2 is incorrect)**

About The Global Coral Reef Alliance

- The Global Coral Reef Alliance, founded in 1990, is a small, non-profit organization dedicated to growing, protecting and managing the most threatened of all marine ecosystems—coral reefs. (So, Statement 3 is incorrect)
- GCRA is a coalition of volunteer scientists, divers, environmentalists and other individuals and organizations, committed to coral reef preservation.
- It primarily focus on coral reef restoration, marine diseases and other issues caused by global climate change, environmental stress and pollution.
- It work on hands-on direct-action projects around the globe to save and restore coral reefs by being the global leader in:
    - preserving the lost knowledge of reefs in the past,
    - correctly diagnosing the causes of the present destruction of reefs, and
    - developing cutting edge therapeutic methods that are our last chance to save coral reefs for future generations.

Q.40) Which of the following are said to be the effects of Eutrophication?

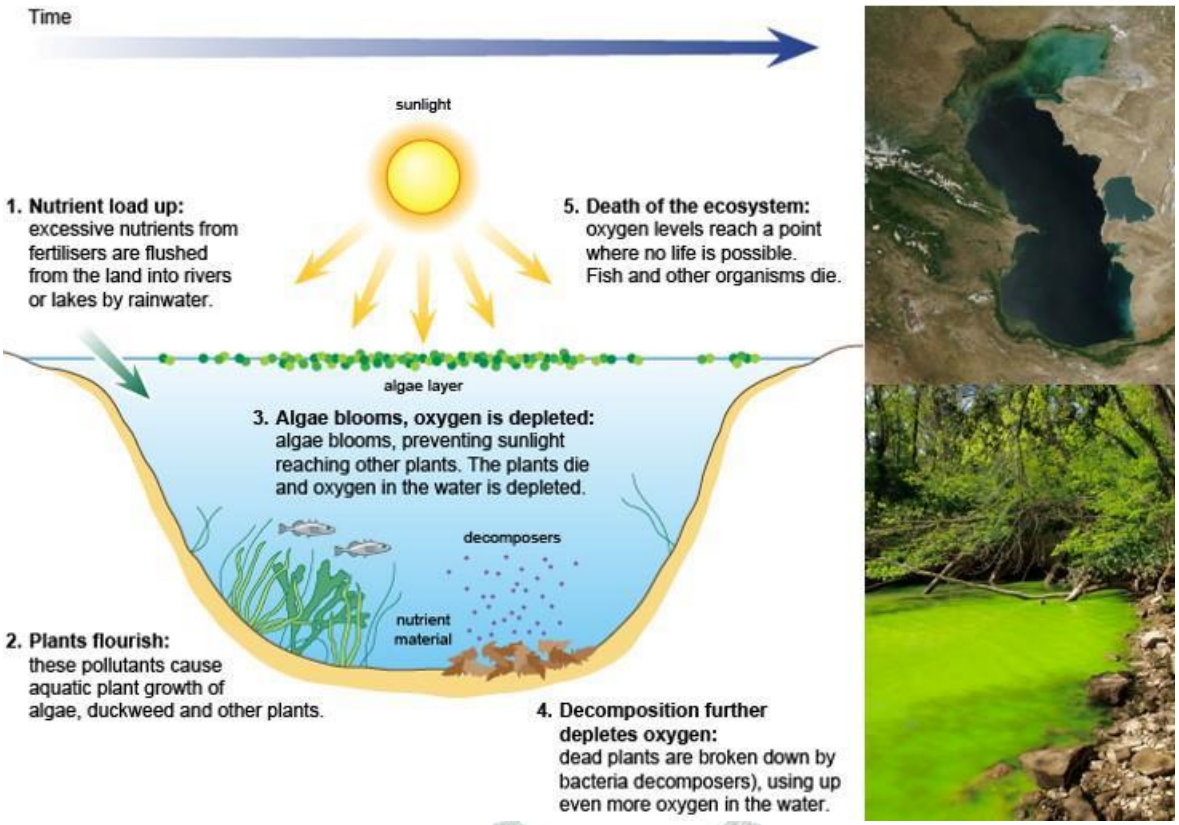
1. It changes the nature of water body to marsh due to creation of detritus layer
2. It may lead to the invasion of new species
3. It leads to the loss of coral reefs

Choose the correct code

a) 1 and 2 only

b) 2 and 3 only
c) 1 and 3 only
d) All of the above

Q.40) Solution (d)



Effects of Eutrophication

Eutrophication eventually creates detritus layer in lakes and produces successively shallower depth of surface water. Eventually the water body is reduced into marsh whose plant community is transformed from an aquatic environment to recognizable terrestrial *Lakes are one of the major sources of fresh water+

Eutrophication may cause the ecosystem competitive by transforming the normal limiting nutrient to abundant level. This cause shifting in species composition of ecosystem

Some algal blooms when died or eaten release neuro and hepatotoxins which can kill aquatic organism and pose threat to humans. Loss of coral reef occurs due to decrease in water transparency (increased turbidity)

Q.41) With reference to measurement of Biodiversity in the ecosystem, consider the following statements:

1. Species evenness measures the number of species found in a community.
2. Alpha diversity measures diversity within a particular area or ecosystem.
3. Gama diversity measures overall diversity for the different ecosystems within a region.

Which of the above statements are correct?

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

Q.41) Solution (b)

Statement analysis

Measurement of Biodiversity

Biodiversity is measured by two major components:

- Species richness, and
- Species evenness.

Species richness is the measure of number of species found in a community

1. **Alpha diversity** refers to the diversity within a particular area or ecosystem, and is usually expressed by the number of species (i.e., species richness) in that ecosystem. (So, statement 2 is correct.)
2. **Beta diversity** is a comparison of diversity between ecosystems, usually measured as the change in amount of species between the ecosystems.
3. **Gamma diversity** is a measure of the overall diversity for the different ecosystems within a region. (So, statement 3, is correct)

Species evenness measures the proportion of species at a given site, e.g. low evenness indicates that a few species dominate the site. (So, statement 1 is incorrect.)

Q.42) The term 'Evil Quartet' is associated with

a) Cause of lower productivity of cultivable land.
b) Role of Administrative machinery in impacting policy decisions.
c) Causes of Human Animal conflict.
d) Causes of rapid extinction of Biological diversity.

Q.42) Solution (d)

Explanation:

Causes of biodiversity losses: The accelerated rates of species extinctions that the world is facing now are largely due to human activities. **There are four major causes (' The Evil Quartet ' is the sobriquet used to describe them).**

1. Habitat loss and fragmentation: This is the most important cause driving animals and plants to extinction. The most dramatic examples of habitat loss come from tropical rain forests. Once covering more than 14 per cent of the earth's land surface, these rain forests now cover no more than 6 per cent. They are being destroyed fast. Besides total loss, the degradation of many habitats by pollution also threatens the survival of many species. When large habitats are broken up into small fragments due to various human activities, mammals and birds requiring large territories and certain animals with migratory habits are badly affected, leading to population declines.
2. Over-exploitation: Humans have always depended on nature for food and shelter, but when 'need' turns to 'greed', it leads to over-exploitation of natural resources. Many species extinctions in the last 500 years (Steller's sea cow, passenger pigeon) were due to overexploitation by humans.
3. Alien species invasions: When alien species are introduced unintentionally or deliberately for whatever purpose, some of them turn invasive, and cause decline or extinction of indigenous species. The Nile perch introduced into Lake Victoria in east Africa led eventually to the extinction of an ecologically unique assemblage of more than 200 species of cichlid fish in the lake.
4. Co-extinctions: When a species becomes extinct, the plant and animal species associated with it in an obligatory way also become extinct. When a host fish species becomes extinct, its unique assemblage of parasites also meets the same fate. Another example is the case of a coevolved plant-pollinator mutualism where extinction of one invariably leads to the extinction of the other.

Q.43) There are different Modes of conservation of Biodiversity, which among the following are an example of Ex-situ conservation

a) Reserved Forests
b) Biosphere reserve
c) Sanctuaries
d) Horticultural Gardens

Q.43) Solution (d)

Explanation:

Some species are conserved at International level while some at National level. Conservation needs different strategies, they can be species based or ecosystem based or habitat based. There are different modes of conservation of Biodiversity. Conservation efforts can be largely grouped into the following two categories:

1. **Ex-Situ Conservation**: Conserving biodiversity outside the areas where they naturally occur is known as Ex-situ conservation.
    - Here, animals are reared or plants are cultivated like zoological parks or botanical gardens. Reintroduction of an animal or plant into the habitat from where it has become extinct is another form of ex -situ conservation.
    - **Seed banks, Cryopreservation, botanical, horticultural and recreational gardens are important centres for ex-situ conservation**.
2. **In- Situ Conservation:** it means "onsite conservation". Conserving the animals and plants in their natural habitats is known as in-situ conservation**. The established natural habitats are: National parks, Sanctuaries, Biosphere reserves and Reserved forests and Protected forests.**

Q.44) Consider the following statements with reference to effects of Environmental pollution on Health:

1. Black foot disease is caused due to Arsenic leaching from soil.
2. Minamata disease is caused due to contamination of cadmium.
3. Sulphur oxide contamination from crude oil causes Yokkaichi Asthma.

Which of the statements given above is/are correct?

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

d) 1, 2 and 3

Q.44) Solution (c)

Explanation:

Statement 1: **Over exploitation of ground water may lead to leaching of arsenic from soil and rock sources and contaminate ground water**. Chronic exposure to arsenic causes **black foot disease.** It also causes diarrhoea, peripheral neuritis, hyperkerotosis and also lung and skin cancer.

Statement 2: **Minamata diseases was caused by the release of methyl mercury** in the industrial wastewater from the Chisso Corporation's chemical factory, which continued from 1932 to 1968. It is also referred to as Chisso-Minamata disease, is a neurological syndrome caused by severe mercury poisoning. **(Itai-itai disease is caused due to cadmium poisioning. Hence statement 2 is incorrect.)**

Statement 3: Yokkaichi Disease occurred in the city of **Yokkaichi** in Mie Prefecture, Japan between 1960 and 1972. **The burning of petroleum and crude oil released large quantities of sulfur oxide** that caused severe smog, resulting in severe cases of chronic obstructive pulmonary disease, chronic bronchitis, pulmonary emphysema, and bronchial asthma among the local inhabitants.

Q.45) Consider the following statements regarding Environmental Impact Assessment:

1. It is notified under Environmental Protection Act of 1986.
2. All projects or activities under category A and B shall require environmental clearance from the state government.
3. There is provision for Public hearing under EIA.

Which of the above statements are correct?

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

Q.45) Solution (c)

Explanation:

Statement 1: Under the Environment (Protection) Act, 1986, India notified its first EIA norms in 1994, setting in place a legal framework for regulating activities that access, utilise, and affect (pollute) natural resources. Every development project has been required to go through the EIA process for obtaining prior environmental clearance ever since.

An EIA notification is issued under Section 3 of the Environment Protection Act, 1986, to impose restrictions on setting up new projects or expansion or modernisation of existing projects. The section stipulates that such measures must benefit the environment. **Hence, Statement 1 is correct.**

Statement 2: Environment Impact Assessment Notification of 2006 has decentralised the environmental clearance projects by categorizing the developmental projects in two categories, i.e., Category A and Category B.

- All projects or activities included in **category 'A'** in the schedule require prior environmental clearances from central government in Ministry of Environment and Forest (MoE&F) on the recommendation of an Expert Appraisal committee (EAC) to be constituted by the central Government.
- While projects or activities under **Category 'B'** in the schedule requires prior environmental clearances from State/ Union territory Environmental impact assessment Authority (SEIAA). **Hence, statement 2 is incorrect.**

Statement 3: The Public Hearing shall be arranged in a systematic, time bound and transparent manner ensuring widest possible public participation at the project site(s) or in its close proximity District -wise, by the concerned State Pollution Control Board (SPCB) or the Union Territory Pollution Control Committee (UTPCC). (**Hence, statement 3 is correct.)**

Q.46) Consider the following statements with reference to Solid Waste Management Rules of 2016?

1. Generator will have to pay 'User Fee' to waste collector and for 'Spot Fine' for Littering and Non-segregation.
2. The rules are applicable to Municipal areas and urban agglomeration only.
3. It introduced the collect back system for bio-degradable Packaging waste.

Which of the statements given above is/are correct?

a) 1 only
b) 2 and 3 only

c) 3 only
d) 1, 2 and 3

Q.46) Solution (a)

Explanation:

Revamping solid waste management rules, government introduced new solid waste management rules in 2016. Following are the salient features of the new rules:

- **The Rules are now applicable beyond Municipal areas and extend to urban agglomerations,** census towns, notified industrial townships, areas under the control of Indian Railways, airports, airbase, Port and harbour, defence establishments, special economic zones, State and Central government organizations, places of pilgrims, religious & historical importance**. Hence, statement 2 is incorrect.**
- As per the new rules, all waste generators should start segregating their waste into three categories – Biodegradables, Dry Waste (Plastic, Paper, metal, Wood) and Domestic Hazardous Waste (diapers, napkins, mosquito repellents, cleaning agents) before they hand it over to the collectors.
- In order to manage the sanitary waste like diapers and sanitary pads effectively, the new guidelines have made it mandatory for the manufacturers to provide a pouch or wrapper for disposal whenever they sell their products to the customer.
- No person should throw, burn, or bury the solid waste generated by him, on streets, open public spaces outside his premises, or in the drain, or water bodies.
- Generator will have to pay '**User Fee'** to waste collector and for **'Spot Fine'** for Littering and Non-segregation**. Hence, statement 1 is correct.**
- The new guidelines says that the brand owners who sell or market their products in **packaging material which are non-biodegradable or are not environmental friendly**, will have to put a system in place to collect back the packaging waste generated due to their production. **(So, statement 3 is incorrect since it asks the same for non-biodegradable not biodegradable.)**
- The **bio-degradable waste** should be processed, treated and disposed of through composting or bio-methanation within the premises as far as possible. The residual waste shall be given to the waste collectors or agency as directed by the local authority.
- All street vendor should keep suitable containers or bins for storage of the waste generated by them such as food waste, disposable plates, cups, cans, wrappers, coconut shells, leftover food, vegetables, fruits etc. They are also responsible for their own waste and should

deposit their waste at a waste storage depot or container or vehicle as notified by the local authority.

- Integration of ragpickers, waste pickers and kabadiwalas from the informal sector to the formal sector by the state government.

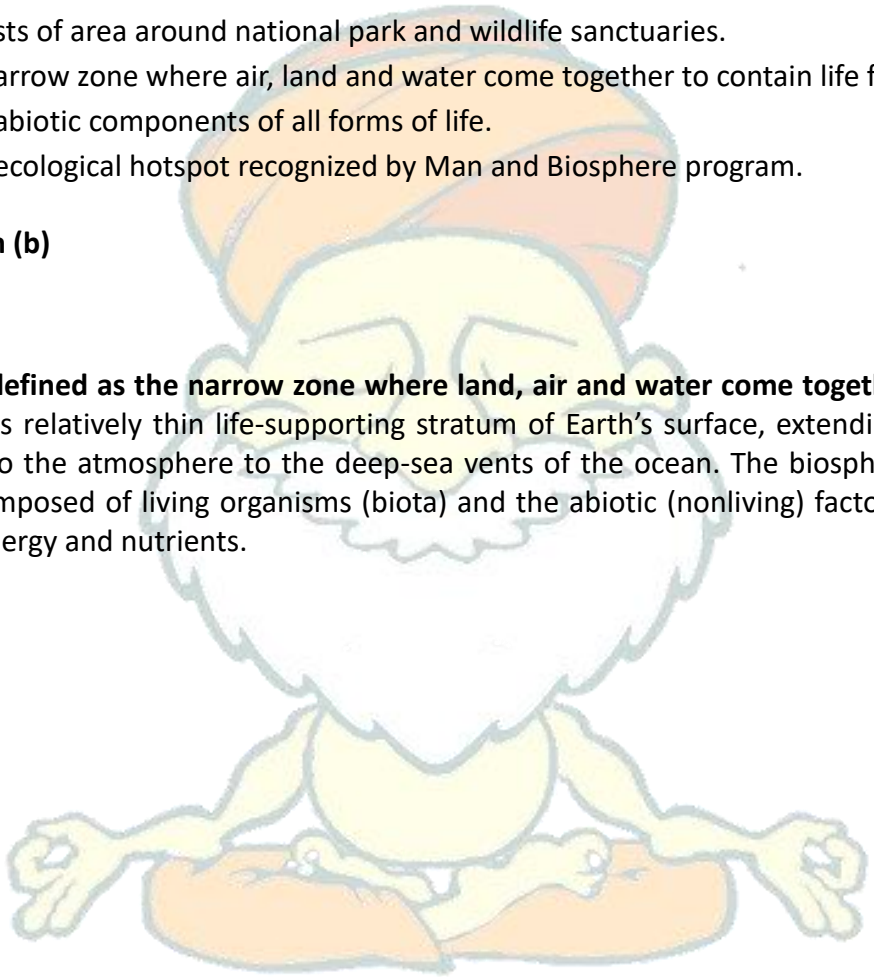
Q.47) Which of the following statements best describes Biosphere:

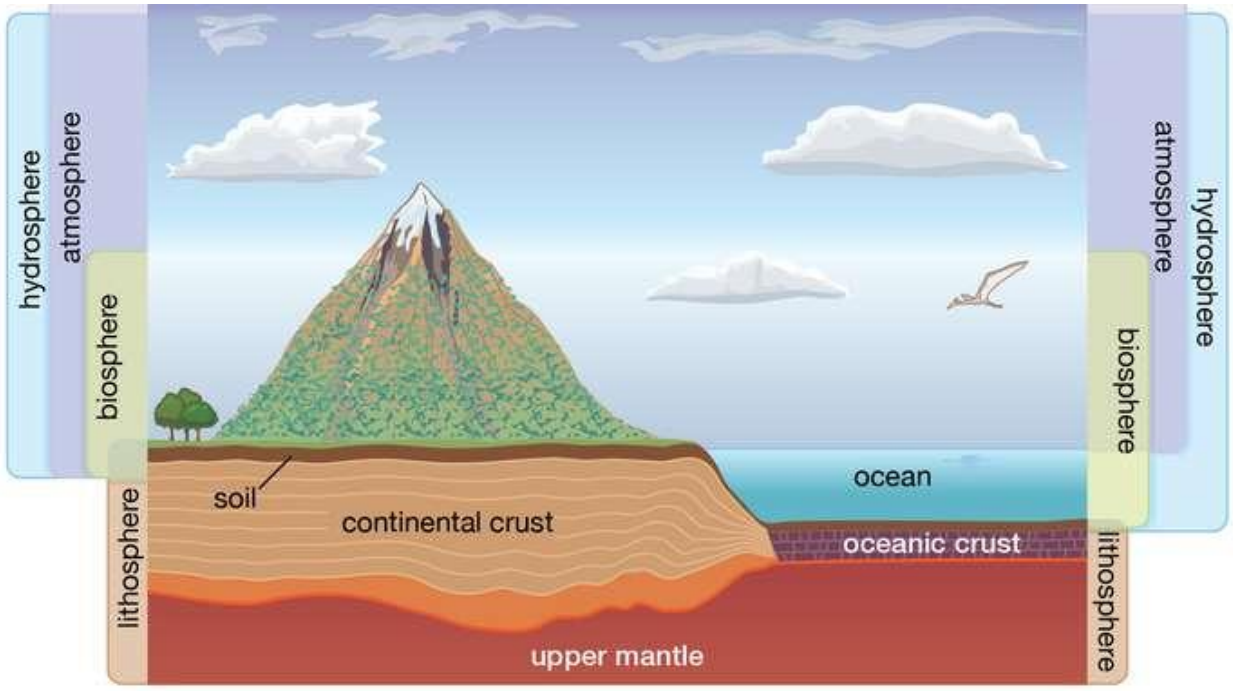
a) It consists of area around national park and wildlife sanctuaries.
b) It is a narrow zone where air, land and water come together to contain life forms.
c) It is an abiotic components of all forms of life.
d) It is an ecological hotspot recognized by Man and Biosphere program.

Q.47) Solution (b)

Explanation:

Biosphere is defined as the narrow zone where land, air and water come together to contain life forms. It is relatively thin life-supporting stratum of Earth's surface, extending from a few kilometres into the atmosphere to the deep-sea vents of the ocean. The biosphere is a global ecosystem composed of living organisms (biota) and the abiotic (nonliving) factors from which they derive energy and nutrients.





Q.48) UNEP along with other organisations has launched a campaign called 'Glowing, Glowing, Gone' to

a) Create awareness about effect of Cosmetic product on Oceans
b) To create awareness about conservation of coral reefs.
c) To combat land desertification
d) To reduce the use of plastic

Q.48) Solution (b)

Statement analysis:

In partnership with the United Nations Environment Programme, the Ocean Agency has launched Glowing Glowing Gone, a creative awareness campaign that draws attention to coral fluorescence due to climate change.

Coral fluorescence, or "glowing" coral, is a last line of defense before coral dies and bleaches. The Ocean Agency worked with Pantone and Adobe to turn the warning colours of glowing coral into three official Pantone colours, to inspire action that everyone can use.

Through Glowing Glowing Gone, The Ocean Agency hopes to garner public support to inspire policy and funding to conserve coral reefs and save an ecosystem on which our entire planet

depends.

Q.49) Which of the following species are endemic to India?

1. Asiatic Lion
2. Sangai deer
3. Lion Tailed Macaque

Select the correct answer using the code given below

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

Q.49) Solution (d)

Basic Information

Endemic species are plant and animal species that are found in a particular geographical region and nowhere else in the world. Some species are endemic to a continent while the others can be endemic to an island.

Statement Analysis:

Statement 1: **The Asiatic lion** is a Panthera leo leo population surviving **today only in India**. Since the turn of the 20th century, its range is restricted to Gir National Park and the surrounding areas in the Indian state of Gujarat. Historically, it inhabited much of Western Asia and the Middle East up to northern India.

Statement 2: **The Sangai** is an endemic and endangered subspecies of brow-antlered deer found only in Manipur, India. It is also the state animal of Manipur.

Statement 3: The **Lion-tailed macaque**, or the wanderoo, is an Old World monkey endemic to the Western Ghats of South India. These animals live is scattered over several areas in Tamil Nadu, Kerala, Karnataka. The lion-tailed macaque ranks among the rarest and most threatened primates. Its IUCN status is Endangered.

Q.50) Consider the following statements about Man and Biosphere Program:

1. The program was launched by Conservation International in 1971.
2. It aims to establish a scientific basis for the improvement of relationships between people and their environments.
3. From India, Panna Tiger reserve is latest to be added in the World network for Biosphere reserve.

Which of the above given statements is/are correct?

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

Q.50) Solution (c)

Explanation:

Statement 1 is incorrect while statement 2 is correct: Man and the Biosphere Programme (MAB) is an intergovernmental scientific program, **launched in 1971 by UNESCO that aims to establish a scientific basis for the improvement of relationships between people and their environments.**

It predicts the consequences of today's actions on tomorrow's world and thereby increases people's ability to efficiently manage natural resources for the well-being of both human populations and the environment.

Statement 3 is Correct: The UNESCO World Network of Biosphere Reserves (WNBR) created in 1977, covers internationally designated protected areas, each known as biosphere reserves. They are created under the Man and the Biosphere Programme (MAB).

Panna Tiger reserve in Madhya Pradesh was declared 12th Biosphere reserve of India under WNBS in November 2020. It is the latest to be added in this list.

Q.51) Which of the following are the causes of species richness in Tropical regions?

1. Tropics had more evolutionary time.
2. They provide relatively constant environment.
3. They receive more solar energy.

Select the correct code

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

Q.51) Solution (d)

Statement Analysis:

Species richness is the number of species within a defined region. The species richness of a region is obtained through sampling or via a census.

- Species richness is generally highest in the tropics and decreases towards the poles. Important explanations for the species richness of the tropics are:
  - Tropics had more evolutionary time;
  - They provide a relatively constant environment and,
  - They receive more solar energy which contributes to greater productivity.
  - Species richness is also function of the area of a region; the species-area relationship is generally a rectangular hyperbolic function.

So, all of the above statements are correct.

Q.52) Consider the following statements with reference to the threats to Earth Biodiversity?

1. The World is currently witnessing the 5th mass extinction which is faster than previous episodes.
2. Stellar sea cow and three subspecies of Tigers are now extinct.

Which of the above given statements is/are incorrect?

a) 1 only
b) 2 only
c) Both
d) None of the above

Q.52) Solution (a)

Explanation:

Incorrect statement is being asked here.

Statement Analysis:

Statement 1: Mass extinction refers to a substantial increase in the degree of extinction or when the Earth loses more than three-quarters of its species in a geologically short period of time. **So far, during the entire history of the Earth, there have been five mass extinctions. The sixth, which is ongoing, is referred to as the Anthropocene extinction.**

- The five mass extinctions that took place in the last 450 million years have led to the destruction of 70-95 per cent of the species of plants, animals and microorganisms that existed earlier.
- These extinctions were caused by "catastrophic alterations" to the environment, such as massive volcanic eruptions, depletion of oceanic oxygen or collision with an asteroid. After each of these extinctions, it took millions of years to regain species comparable to those that existed before the event.
- **The current species extinction rates are estimated to be 100 to 1,000 times faster than in the pre-human times and our activities are responsible for the faster rates.** Ecologists warn that if the present trends continue, nearly half of all the species on earth might be wiped out within the next 100 years. (**So, statement 1 is incorrect here, since it is Sixth Extinction not fifth.)**

Statement 2: The biological wealth of our planet has been declining rapidly and the accusing finger is clearly pointing to human activities. **Some examples of recent extinctions include the dodo (Mauritius), quagga (Africa), thylacine (Australia), Steller's Sea Cow (Russia) and three subspecies (Bali, Javan, Caspian) of tiger.** The last twenty years alone have witnessed the disappearance of 27 species. **Hence, statement 2 is correct.**

Q.53) In general the loss of Biodiversity in a region may lead to which of the following

1. Increase in plant production.
2. It will lead to lower resistance to environmental perturbations.
3. Increased variability in certain ecosystem process.

Select the correct answer using the code given below

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

d) 1, 2 and 3

Q.53) Solution (b)

Explanation:

Biodiversity loss includes the extinction of species (plant or animal) worldwide, as well as the local reduction or loss of species in a certain habitat, resulting in a loss of biological diversity. The latter phenomenon can be temporary or permanent, depending on whether the environmental degradation that leads to the loss is reversible through ecological restoration/ecological resilience or effectively permanent (e.g. through land loss).

In general, loss of biodiversity in a region may lead to

- **Decline in plant production,**
- **Lowered resistance to environmental perturbations such as drought and**
- **Increased variability in certain ecosystem processes such as plant productivity, water use, and pest and disease cycles.**

So, only statement 2 and 3 is correct.

Q.54) Which of the following is the biggest overall contributor to the natural greenhouse effect?

a) Carbon Dioxide
b) Nitrous Oxide
c) Water Vapour
d) Methane

Q.54) Solution (c)

Basic Information:

Greenhouse gases (GHGs) control energy flows in the atmosphere by absorbing infra–red radiation. These trace gases comprise less than 1% of the atmosphere. Their levels are determined by a balance between "sources" and "sinks". Sources are processes that generate greenhouse gases; sinks are processes that destroy or remove them. Humans affect greenhouse gas levels by introducing new sources or by interfering with natural sinks.

Statement analysis:

Note- the question is asking natural greenhouse effect contributor.

Statement 1 is incorrect: Carbon dioxide is currently responsible for over 60% of the "enhanced" greenhouse effect, which is responsible for climate change. This gas occurs naturally in the atmosphere, but burning coal, oil, and natural gas is releasing the carbon stored in these "fossil fuels" at an unprecedented rate.

Statement 2 is incorrect: Nitrous oxide (N2O) is naturally present in the atmosphere as part of the Earth's nitrogen cycle, and has a variety of natural sources. However, human activities such as agriculture, fossil fuel combustion, wastewater management, and industrial processes are increasing the amount of N2O in the atmosphere.

Statement 3 is correct**: Water vapour is the biggest overall contributor to the natural greenhouse effect and humans are not directly responsible for emitting this gas in quantities sufficient to change its concentration in the atmosphere.** However, CO2 and other greenhouse gases is increasing the amount of water vapour in the air by boosting the rate of evaporation.

Statement 4 is incorrect: **Methane is a powerful greenhouse gas whose levels have already doubled.** The main "new" sources of methane are agricultural, notably flooded rice paddies and expanding herds of cattle. Emissions from waste dumps and leaks from coal mining and natural gas production also contribute. The main sink for methane is chemical reactions in the atmosphere.

Q.55) Consider the following statements:

1. Pyrolysis is a process of chemical decomposition of organic matter brought about by heat.
2. In incineration waste is directly burned in the presence of excess air (oxygen) at high temperatures.

Which of the above given statements is/are correct?

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

Q.55) Solution (c)

Explanation:

Statement 1 is correct: **Pyrolysis is a process of chemical decomposition of organic matter brought about by heat**. In this process, the organic material is heated in the absence of air until the molecules thermally break down to become a gas comprising smaller molecules (known collectively as syngas).

Statement 2 is correct: **In Incineration waste is directly burned in the presence of excess air (oxygen) at high temperatures (about 800°C), liberating heat energy, inert gases and ash**. Combustion results in transfer of 65–80% of heat content of the organic matter to hot air, steam and hot water.

Q.56) Consider the following statements with reference to protected area network:

1. Environment protection act 1986, provided for the establishment of Wildlife Sanctuaries.
2. Conservation reserves and community reserves are the outcome of the amendment in 2002 in wildlife protection act of 1972.

Which of the above statements is/are correct?

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

Q.56) Solution (b)

Basic informstion:

Protected areas are those in which human occupation or at least the exploitation of resources is limited. There are several kinds of protected areas, which vary by level of protection depending on the enabling laws of each country or the regulations of the international organizations involved. The term "protected area" also includes Marine Protected Areas, the boundaries of which will include some area of ocean, and Transboundary Protected Areas that overlap multiple countries which remove the borders inside the area for conservation and economic purposes.

Statement Analysis

Statement 1: Any area other than area comprised with any reserve forest or the territorial waters can be notified by the State Government to constitute as a sanctuary if such area is of adequate ecological, faunal, floral, geomorphological, natural. Or zoological significance, for the

purpose of protecting, propagating or developing wildlife or its environment. **Some restricted human activities are allowed inside the Sanctuary area details of which are given in CHAPTER IV, WPA 1972. (So, statement 1 is incorrect.)**

Statement 2: The **Conservation reserves and community reserves** in India are terms denoting protected areas of India which typically act as buffer zones to or connectors and migration corridors between established national parks, wildlife sanctuaries and reserved and protected forests of India. Such areas are designated as conservation areas if they are uninhabited and completely owned by the Government of India but used for subsistence by communities and community areas if part of the lands are privately owned.

These protected area categories were first introduced in the Wildlife (Protection) Amendment Act of 2002 – the amendment to the Wildlife Protection Act of 1972. (So, statement 2 is correct.)

Q.57) Consider the following statements about World Database of Protected Areas.

1. It is the largest and most comprehensive global database on terrestrial and marine protected areas.
2. It is a Joint project between Conservation international and TRAFFIC.
3. It is updated on yearly basis.

Select the correct answer using the code given below:

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

Q.57) Solution (a)

Statement analysis:

The WDPA was established in 1981, but the mandate for the database dates back from 1959 when the United Nations (UN) Economic and Social Council called for a list of national parks and equivalent reserves in recognition that they 'are valuable for economic and scientific reasons. and also as areas for the future preservation of fauna and flora and geologic structures in their natural state' Resolution 713 (XXVII).

- The first UN List of Protected Areas, as it became known, was subsequently published in 1962. Since this time there have been several decisions from the Conference of the

Parties to the Convention on Biological Diversity encouraging Parties to share and update relevant information on their protected areas system with the World Database on Protected Areas.

- **The World Database on Protected Areas (WDPA) is the largest and most comprehensive global database of marine and terrestrial protected areas**.
- It is **a joint project between UN Environment Programme and the International Union for Conservation of Nature (IUCN)**,
- The role of custodian is allocated to the Protected Areas Programme of UNEP-WCMC, based in Cambridge, UK, who have hosted the database since its creation in 1981 in collaboration with governments, non-governmental organisations, academia and industry.
- **The WDPA is updated on a monthly basis,**
- The WDPA delivers invaluable information to decision-makers around the world, particularly in terms of measuring the extent and effectiveness of protected areas as an indicator for meeting global biodiversity targets.

Q.58) Consider the following statements with reference to difference between National park and Wildlife sanctuaries.

1. No human activity can be allowed in National park in any condition while some restricted human activities are allowed in Wildlife sanctuaries.
2. National Parks are declared by Central government while wildlife sanctuaries are declared by State Government under Wildlife Protection act of 1972.

Which of the above statements is/are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 and 2

Q.58) Solution (d)

Explanation:

The Wildlife (Protection) Act, 1972 provides for the establishment of Protected Areas in India. Here are all the differences between Wildlife Sanctuaries and National Parks.

National Park	Wildlife sanctuaries
• National parks provide protection to the entire ecosystem that is, flora, fauna, landscape, etc. of that region. • National parks are given a greater degree of protection, with human activity greatly restricted. • Boundaries are fixed by administration. **Only certain areas can be visited and only activities permitted by the chief wildlife warden of the state are allowed in the park. (**So**, statement 1 is incorrect** since it says in any condition which is an absurd statement.)	• Wildlife Sanctuary, as the name implies, is the place that is reserved exclusively for wildlife use, which includes animals, reptiles, insects, birds, etc. wild animals, especially those in danger of extinction and the rare ones, so that they can live in peace for a lifetime and keep their population viable. • It has relatively less restrictions and is open to people, without the requirement of official permission. **So some restricted activities are allowed here.** • It does not have fixed boundaries and human activities are permitted to a specified limit.

Similarities include: The **Wildlife (Protection) Act (WPA) of 1972 provided for the declaration of National Parks by the State Government in addition to the declaration of wildlife sanctuaries. The Central Government may also declare, Wild Life Sanctuary and National Park under certain conditions.**

So, both statements are incorrect here.

Q.59) Consider the following statements about Ecologically Sensitive Zones

1. The ecologically sensitive zone is mentioned under Environment Protection act of 1986.
2. It is an area around National park and Wildlife sanctuaries where developmental activities are prohibited.

Which of the above statements is/are incorrect?

a) 1 only
b) 2 only
c) Both 1 and 2

d) Neither 1 nor 2

Q.59) Solution (d)

Basic Information

Eco-Sensitive Zones (ESZs) or Ecologically Fragile Areas (EFAs) are areas in India notified by the Ministry of Environment, Forests and Climate Change (MoEFCC), Government of India around Protected Areas, National Parks and Wildlife Sanctuaries. The purpose of declaring ESZs is to create some kind of "shock absorbers" to the protected areas by regulating and managing the activities around such areas. They also act as a transition zone from areas of high protection to areas involving lesser protection.

Explanation:

Note: Incorrect statements are asked.

Statement 1 is incorrect: **The Environment (Protection) Act, 1986 does not mention the word "Eco-Sensitive Zones".** However, Section 3(2)(v) of the Act, says that Central Government can restrict areas in which any industries, operations or processes or class of industries, operations or processes shall not be carried out or shall be carried out subject to certain safeguards.

Statement 2 is in Incorrect: **The basic aim of ESZ guideline is to regulate (not prohibit)** certain activities around National Parks and Wildlife Sanctuaries so as to minimise the negative impacts of such activities on the fragile ecosystem encompassing the protected areas,

Q.60) Which of the following statements is/are correct with reference to National Adaptation fund for climate change?

1. It is a centrally sponsored scheme to support concrete adaptation activities to mitigate adverse effects of climate change.
2. The activities under this scheme is implemented in project mode.
3. NABARD is the national implementing Entity for adaption fund under Montreal Protocol.

Select the correct code:

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

Q.60) Solution (b)

Statement analysis:

Statement 1 is incorrect**:** **The National Adaptation Fund for Climate Change (NAFCC) is a Central Sector Scheme which was set up in the year 2015-16.** The overall aim of NAFCC is to support concrete adaptation activities which mitigate the adverse effects of climate change. The activities under this scheme are implemented in a project mode. The projects related to adaptation in sectors such as agriculture, animal husbandry, water, forestry, tourism etc. are eligible for funding under NAFCC.

Statement 2 is correct**:** **The activities under this scheme will be implemented in project mode.** The projects under NAFCC prioritizes the needs that builds climate resilience in the areas identified under the SAPCC (State Action Plan on Climate Change) and the relevant Missions under NAPCC (National Action Plan on Climate Change).

Statement 3 is incorrect: Considering the existing arrangement with **NABARD** as National Implementing Entity (NIE) for Adaptation Fund (AF) **under Kyoto Protocol** and its presence across the country

- NABARD has been designated as National Implementing Entity (NIE) for implementation of adaptation projects under NAFCC by Govt. of India.
- Under this arrangement, NABARD would perform roles in facilitating identification of project ideas/concepts from State Action Plan for Climate Change (SAPCC), project formulation, appraisal, and sanction, disbursement of fund, monitoring & evaluation and capacity building of stakeholders including State Governments.

Q.61) Consider the following statements with respect Adaption Gap Report 2020:

1. It is released by UNFCCC.
2. This report show positive development in area of Adoption by countries.
3. Paris Agreement majorly focussed on Mitigation, while ignored the adaption.

Which of the above statements given above is/are correct?

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

Q.61) Solution (b)

Statements Explanation

Statement 1: Adaptation Gap Report was released by United Nations Environment Programme (UNEP).it was fifth Adaption gap report. **(So statement 1 is incorrect).**

Statement 2: Adaptation Gap Report, 2020 assessed on three parameters –

- Planning → Adaptation action is now widely embedded in policy planning across the world. 72% of countries have adopted at least one national-level adaptation planning instrument
- Finance→ Adaption financial gap is not closing, but there has been increase in Finance.
- Implementation → Implementation of adaptation actions is growing, but there is yet limited evidence of climate risk reduction.

(So statement 2 is correct.)

Statement 3: Adaptation is a key pillar of the Paris Agreement. The Agreement requires all of its signatories to plan and implement adaptation measures through national adaptation plans, studies, monitoring of climate change effects and investment in a green future.
(So statement 3 is incorrect.)

Q.62) Consider the following statements about Solar Energy production in India:

1. National Solar Production has set a target of 100 GW, of which 60% will be from solar rooftop.
2. Currently, Energy from Solar Rooftop only comprises 40% of total solar production.
3. Grid connected Rooftop solar programme are being implemented by DISCOMs.

Which of the following is/are correct statements?

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

Q.62) solution (b)

Explanation

In a Solar Rooftop system the solar panels are installed in the roof of any residential, commercial, institutional and industrial buildings to produce electricity.

National Solar Mission has set a target to achieve 100 GW of installed capacity of solar energy by the end of 2022. Out of this, 40 GW is the target set for the SRT System. **(So, statement 1 is incorrect)**

At present the SRT systems account only for 12% of solar power generation. **(Hence, statement 2 is incorrect)**

There are two type of Solar Rooftop system-

- **SRT System with storage facility** - in this system, solar energy is stored in battery and used when sun is not available.
- **Grid-connected SRT system –** in this system, dc power generated is converted into AC power using power conditioning units.

Grid Connected Rooftop Solar Programme

- The Ministry of New and Renewable Energy launched this programme and it is being implemented by DISCOMs (Distribution companies).
- The objective of the programme is to achieve a cumulative capacity of 40 GW by the year 2022 through Grid Connected SRT System.
- DISCOMs are compensated for the additional expenditure they incur on implementing the programme.

Q.63) Consider the following statements regarding Global Climate Risk Index:

1. It is released by Germanwatch.
2. India was largest worst-hit country due to extreme weather.
3. India had a highest economic loss in 2019 due to extreme weather events.

Which of the above statement is/are correct?

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

Q.63) Solution (b)

Explanation:

GLOBAL CLIMATE RISK INDEX

- It has been released by Germanwatch (an NGO based in Germany).
- Index analyses to what extent countries and regions have been affected by impacts of weather-related loss events
- Reports about India
    - India had a high number of fatalities and the biggest economic loss in 2019.
    - India was the seventh worst-hit country due to extreme weather events in 2019 (Mozambique is the worst-affected). **(So, statement 2 is incorrect)**
    - Flooding caused by heavy rain was responsible for 1,800 deaths and led to the displacement of 1.8 million people.
    - There were eight tropical cyclones in India. Six of them were "very severe.
- Also Index highlight vulnerability of Poor nations due to damaging effects of hazard and lower adaption and mitigation capacity.

Q.64) Consider the following statements regarding Ammonia Pollution:

1. Ammonia is a white-coloured highly reactive and insoluble alkaline gas.
2. Agriculture is largest emitter of Ammonia.
3. Reaction of Ammonia with other gas leads to formation of PM 2.5.

Which of the above statement is/are correct?

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

Q.64) Solution (c)

Explanation:

Ammonia Pollution

- Ammonia (NH_3) is a **colourless highly reactive and soluble alkaline gas. (Hence, Statement 1 is incorrect)**
- It is prominent constituent of the nitrogen cycle that adversely affects ecosystems at higher concentrations.
- **Sources of emissions:**

- The largest source of NH3 emissions is agriculture, including animal husbandry and NH3 based fertilizer applications.
- Other sources of NH3 include
  - Industrial processes,
  - Vehicular emissions,
  - Volatilization from soils and oceans,
  - Decomposition of organic waste,
  - Forest fires,
  - Animal and human waste,
  - Nitrogen fixation processes.

- **Usage of Ammonia**
  - Industrial chemical in the production of fertilisers, plastics, synthetic fibres, dyes and other products
  - Manufacturing of fertilizers
- **Effect of Ammonia Pollution**
  - Denitrification which leads to increased greenhouse gas and thus increasing global warming.
  - Air Pollution – it reacts with other oxides and pollutant to form PM 2.5 and fine particle of ammonium salt which result into haze like condition.
  - Water Pollution – it increases toxicity of water and also leads to algal blooms.
  - Ecosystem Damage- excess of Ammonia can lead to eutrophication and acidification, which will have adverse effect on any ecosystem. It may also affect species composition
  - Reaction of Ammonia with human body leads to creation of Ammonia Hydroxide, which leads to cellular destruction.

Q.65) Consider the following pairs of Hydrogen according to their process of extraction:

Type of Hydrogen	:	Process of Extraction
1. Green Hydrogen	:	Derived from Natural Gas
2. Grey Hydrogen	:	Derived using Fossil Fuel
3. Blue Hydrogen	:	Electrolysis of Water

Which of the above pairs is/are correctly matched?

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

Q.65) Solution (b)

Explanation:

Types of hydrogen depending upon process of extraction

- **Green hydrogen**: It is **derived by electrolysis of water**, separating the hydrogen atom within it from oxygen using renewable energy (such as wind, solar or hydro) that eliminates emissions during process.
- **Grey hydrogen**: Hydrogen **derived using fossil fuels** is called as grey hydrogen. Most hydrogen nowadays comes from natural gas: it is bonded with carbon and can be separated from it via a process involving water called **"steam reforming"**, but the excess carbon generates CO2 .Grey hydrogen accounts for most of the production today and emits about 9.3kg of CO2 per kg of hydrogen production.
- **Blue hydrogen- Hydrogen** is considered blue whenever the emission generated from the steam reforming process are captured and stored underground via industrial carbon capture and storage (CSS), so that it is not dispersed in the atmosphere.

Basics of Hydrogen Fuel

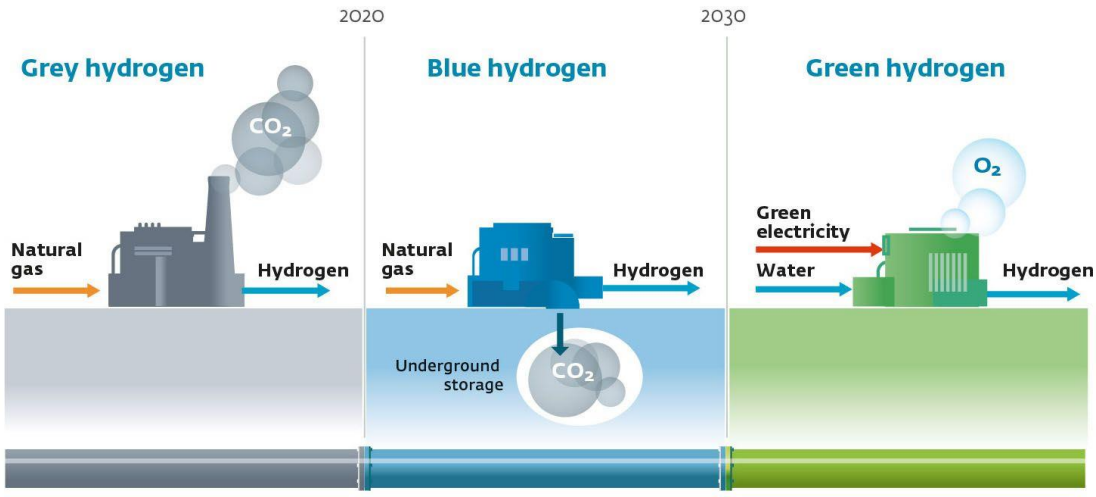
Hydrogen fuel is a zero carbon fuel burned with oxygen. It can be used in fuel cells or internal combustion engines. It has begun to be used in commercial fuel cell vehicles, such as passenger cars, and has been used in fuel cell buses for many years. It is also used as a fuel for spacecraft propulsion.

As of 2018, the majority of hydrogen (~95%) is produced from fossil fuels by steam reforming or partial oxidation of methane and coal gasification with only a small quantity by alternative routes such as biomass gasification or electrolysis of water or solar thermochemistry, a solar fuel with no carbon emissions.

In a flame of pure hydrogen gas, burning in air, the hydrogen (H2) reacts with oxygen (O2) to form water (H2O) and releases energy.

$$2H_2\,(g) + O_2\,(g) \rightarrow 2H_2O\,(g) + \text{energy}$$

If carried out in atmospheric air instead of pure oxygen, as is usually the case, hydrogen combustion may yield small amounts of nitrogen oxides, along with the water vapour.



Q.66) Consider the following statements:

1. India is largest emitter of Sulphur oxide for fifth consecutive year.
2. Sulphur emission is on decline since last year.
3. Biggest contributor of Sulphur oxide in India is copper smelting plants.

Which of the above statements is/are correct?

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

Q.66) Solution (a)

Explanation:

Statement 1: India emitted 21% of global anthropogenic (human-made) SO2 emissions, mostly from coal-fired power plants that lack pollution-curbing equipment. India still occupies the top emitter's position for the fifth consecutive year followed by Russia and China. Greenpeace India has also released an analysis of NASA data which shows that India has more than 15% of all anthropogenic SO2 hotspots in the world.

Statement 2: For the first time in four years India's sulphur dioxide (SO2) emissions recorded a significant decline of approximately 6% in 2019 compared to 2018, the steepest drop in four years, according to a report from Greenpeace India and the Centre for Research on Energy and Clean Air (CREA).

Statement 3: As per the report, the biggest emission hotspots in India are thermal power stations (or clusters of power stations) at Singrauli, Neyveli, Sipat etc. Most coal plants in India are lacking in flue-gas desulfurization (FGD) technology, which is necessary to scrub emissions clean off sulphur.

About Sulphur Oxide

- It is emitted by the burning of fossil fuels coal, oil, and diesel or other materials that contain sulphur. It is also a natural by-product of volcanic activity. Ex: power plants, metals processing and smelting facilities, and vehicles.
- It can create **secondary pollutants** once released into the air. Secondary pollutants formed with sulphur dioxide include sulphate aerosols, particulate matter, and acid rain.
- It increases the risk of stroke, heart disease, lung cancer, and premature death.

Q.67) With reference to Dam Rehabilitation and Improvement Project (DRIP), consider the following statements:

1. This project is being implemented by Central Water Commission.
2. This project also includes capacity building of Dam owners.
3. This project is assisted by World Bank and Asian Infrastructure Investment Bank.

Which of the statements given above is/are correct?

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

Q.67) Solution (d)

Explanation:

The Dam Rehabilitation and Improvement Project (DRIP) has been taken up with loan assistance of the World Bank for rehabilitation and improvement of about 223 dam Projects initially in seven States (namely Jharkhand, Karnataka, Kerala, Madhya Pradesh, Odisha, Tamil Nadu, and Uttarakhand) and institutional strengthening and project management in Central Water Commission (CWC) and other Implementing Agencies; the actual number of dams under DRIP may vary owing to the addition / deletion of dams during implementation. **For Phase II and III, financial assistance of 7000 crore Rupees have been made by World Banks and Asian**

Infrastructure Investment Bank.

The project consists of three components:

1) **Rehabilitation and Improvement of dams and associated appurtenances** → focusing on structural and non-structural measures at 223 project dams, many of which are more than 25 years old. The number of dams proposed for inclusion in the project is based on proposals received from the four participating states
2) **Dam Safety Institutional Strengthening in participating States and CWC** → focusing on regulatory and technical frameworks for dam safety assurance. The activities include targeted training nationally and internationally to Dam Safety Organizations at Central (CDSO) and State (SDSO) level, development of Management Information Systems (MIS) and other programs to capture and analyse data for long-term planning and guiding of dam operations; support to the further development within CWC of the Dam Health and Rehabilitation Monitoring Application (DHARMA) program . **In addition to physical rehabilitation, emphasis has been given to capacity building of dam owners through customized training programmes.**
3) **Project Management**→ The overall responsibility for project oversight and coordination will rest with the Dam Safety Rehabilitation Directorate in the CDSO of CWC.

Q.68) Consider the following statements about Nitrogen Pollution:

1. N_2O is 300 times more potent as a greenhouse gas than carbon dioxide (CO_2).
2. Fossil-fuel burning — for power, transport and industry – is the largest emitter of Nitrogen oxide.

Which of the above statement is/are correct?

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

Q.68) Solution (a)

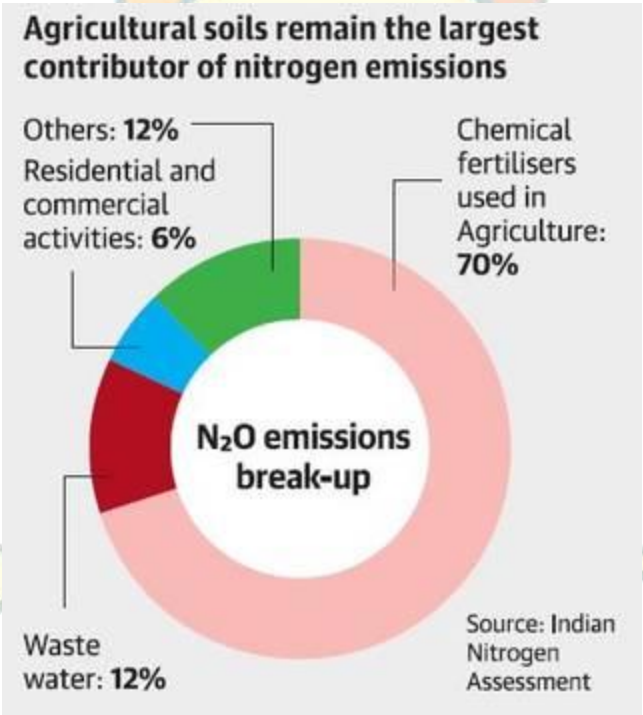
Explanation:

About Nitrogen

- Nitrogen is essential to all life on Earth as it forms an important component of life-building and propagating biochemical molecules like proteins.
- But overuse in agriculture in the form of fertilisers and other fields have made this important element more bane than boon.
- Some of these forms of nitrogen like N_2O can have far reaching impacts for humanity.
- N_2O is 300 times more potent as a greenhouse gas than carbon dioxide (CO_2).

Nitrogen Emission in India:

- NO_x emissions grew at 52% from 1991 to 2001 and 69% from 2001 to 2011 in India.
- Agriculture is the largest contributor to nitrogen emissions.
- Non-agricultural emissions of nitrogen oxides and nitrous oxide were growing rapidly, with sewage and fossil-fuel burning — for power, transport and industry — leading the trend.



Q.69) Consider the following statement regarding India Water Resources Information System (India- WRIS):

1. It was launched under National Hydrology Project.

2. National Water Informatics Centre has been established to maintain and update India-WRIS.
3. This portal also contains data regarding evapotranspiration and soil moisture.
4. It is mandatory for every state to provide data regarding water usage under this portal.

Which of the above given statement are correct?

a) 1, 2 and 3 only
b) 1, 2 and 4 only
c) 2, 3 and 4 only
d) All of the above

Q.69) Solution (a)

Explanation:

India Water Resource Information System

- The Ministry of Jal Shakti has launched a new version of the India Water Resources Information System (India-WRIS) with new functionalities and features.
- **Ministry of Jal Shakti (MoJS), under the National Hydrology Project, launched the first version of India Water Resources Information System (India-WRIS) in July, 2019.**
- Since then, a number of new functionalities and features have been added into the system.
- This portal contains information related to Water Resources through dashboards for rainfall, water levels & discharge of rivers, water bodies, ground water levels, reservoir storages, **evapotranspiration and soil moisture**, as well as modules on water resources projects, water bodies, hydro-met data availability and tools for GIS layer editing.
- India WRIS is, at present, receiving data from many central and state agencies like CWC, CGWB, IMD, NRSC, Andhra Pradesh, Uttar Pradesh and Gujarat etc. on regular basis. However, there is no compulsion on states to submit data regarding water usage. (**So, statement 4 is incorrect)**
- Data from other agencies is also being integrated into the system, so that it becomes a comprehensive platform for any data related to water and land resources.
- **The MoJS has established a dedicated organization, National Water Informatics Centre (NWIC) to maintain and update India WRIS.**

Q.70) "Race to Zero" Campaign is organised by which of the following organisation?

a) United Nations Environment Programme (UNEP)
b) Intergovernmental Panel on Climate Change (IPCC)
c) United Nations Framework Convention on Climate Change (UNFCCC)
d) International Union for Conservation of Nature (IUCN)

Q.70) Solution (c)

Explanation:

The UNFCCC's Climate Ambition Alliance has launched a global campaign called "Race to Zero" that encourages countries, companies, and other entities to deliver structured net-zero greenhouse-gas emission pledges by the time the talks begin.

"Race to Zero" is a global campaign to rally leadership and support from businesses, cities, regions, investors for a healthy, resilient, zero carbon recovery that prevents future threats, creates decent jobs, and unlocks inclusive, sustainable growth.

It mobilizes a coalition of leading net zero initiatives, representing **454 cities, 23 regions, 1,397 businesses, 74 of the biggest investors, and 569 universities**. These 'real economy' actors join 120 countries in the largest ever alliance committed to achieving net zero carbon emissions by 2050 at the latest. Collectively these actors now cover nearly 25% global CO_2 emissions and over 50% GDP.

Led by the High-Level Climate Champions for Climate Action – Race to Zero mobilizes actors outside of national governments to join the Climate Ambition Alliance, which was launched at the UNSG's Climate Action Summit 2019.

Q.71) Consider the following statements regarding Climate Ambition Alliance (CAC):

1. It was led by India at 25th Conference of Party of UNFCCC.
2. Under this CAC, targets are more ambitious than defined in Paris Agreement.
3. This alliance includes regions, cities and investment companies.

Choose correct option from below:

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

d) 1, 2 and 3

Q.71) Solution (c)

Explanation:

CLIMATE AMBITION ALLIANCE

As requested by the United Nations Secretary General, António Guterres, and with the support of the UNFCCC and UNDP, **Chile led the Mitigation Coalition during the UN Climate Action Summit 2019.**

- In that context, **Chile announced on September, in New York, the Climate Ambition Alliance that commits nations to be more ambitious in their Nationally Determined Contributions as established in the Paris Agreement.**
- It also includes firm actions on adaptation and an active participation of the private sector.
- All efforts aim to accelerate the necessary transformation to reach the goals of the Paris Agreement and stabilize the global temperature rise to 1.5°C.
- This commitment also includes regions, cities, companies and investments.
- To give an extra boost to the Climate Ambition Alliance, on World Environment Day 2020, Chile and the United Kingdom launched the "Race To Zero" campaign, which will bring together the leadership and support of businesses, cities, regions and investors for a healthy, resilient and carbon-free recovery that prevents future threats, creates decent jobs, and enables inclusive and sustainable growth.
- All members of the alliance are committed to the same goal: achieving carbon neutrality by 2050.

Q.72) Consider the following statements about afforestation measures taken by international organisation:

1. Deforestation and forest degradation account for carbon emissions, more than the entire global transportation sector and energy sector.
2. UN-REDD, launched by UNFCCC, incentivize country for sustaining forests.
3. REDD+ focused to mitigate climate change through reducing net emissions of greenhouse gases through enhanced forest management in developing countries.

Which of the above given statement are incorrect?

a) 1 and 2 only
b) 1 and 3 only
c) 2 and 3 only
d) All of the above

Q.72) Solution (a)

Explanation

Statement 1: Deforestation and forest degradation account for approximately 11 percent of carbon emissions, more than the entire global transportation sector and **second only to the energy sector.**

Statement 2: The United Nations Programme on Reducing Emissions from Deforestation and Forest Degradation **(UN-REDD Programme)** is a collaborative programme of the Food and Agriculture Organization (FAO), the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP), created in 2008 in response to the UNFCCC decisions on the Bali Action Plan and REDD at COP-13. **(So, Statement 2 is incorrect**)

The overall development goal of the Programme is "to reduce forest emissions and enhance carbon stocks in forests while contributing to national sustainable development". The UN-REDD Programme supports nationally led REDD+ processes and promotes the informed and meaningful involvement of all stakeholders, including indigenous peoples and other forest-dependent communities, in national and international REDD+ implementation

Statement 3: REDD+ was first negotiated under the United Nations Framework Convention on Climate Change (UNFCCC) in 2005, with the objective of mitigating climate change through reducing net emissions of greenhouse gases through **enhanced forest management in developing countries.**

Q.73) Consider the following statements regarding "National Adaption Fund for Climate Change":

1. It was established in 2015 to meet the cost of adaption to climate change in particularly vulnerable States and Union Territories.
2. The National Afforestation and Eco-Development Board (NAEB) is National Implementing Agency of this fund.

Which of the given statement is/are correct?

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

Q.73) Solution (a)

Explanation:

NATIONAL ADAPTATION FUND FOR CLIMATE CHANGE

- The National Adaptation Fund for Climate Change (NAFCC) was established in August, 2015 to meet the cost of adaptation to climate change for the State and Union Territories of India that are particularly vulnerable to the adverse effects of climate change.
- Government has set up a budget provision of Rs.350 crores for the year 2015-16 and 2016-17, with an estimated requirement of Rs. 181.5 crores for financial year 2017-18 for NAFCC.
- The projects under NAFCC prioritize the needs that build climate resilience in the areas identified under the SAPCC (State Action Plan on Climate Change) and the relevant Missions under NAPCC (National Action Plan on Climate Change).
- Considering the existing arrangement with NABARD as National Implementing Entity (NIE) for Adaptation Fund (AF) under Kyoto Protocol and its presence across the country, NABARD has been designated as National Implementing Entity (NIE) for implementation of adaptation projects under NAFCC by Govt. of India. **(Hence , Statement 2 is incorrect)**
- Under this arrangement, NABARD would perform roles in facilitating identification of project ideas/concepts from State Action Plan for Climate Change (SAPCC), project formulation, appraisal, and sanction, disbursement of fund, monitoring & evaluation and capacity building of stakeholders including State Governments.

Q.74) Kyoto Protocol and Paris Agreement are two significant measures to contain environment degradation. But there are differences in their approaches. Which of the following are some of those differences?

1. Kyoto Protocol had differentiated between developed and developing countries, while there was not such differences in Paris Agreement.

2. Kyoto Protocol has set binding target for some countries, while Paris Agreement has no such binding target.
3. Kyoto Protocol's objective is reduction of emission of 6 major Green House Gas, while Paris Agreement targets temperature control.

Choose correct option from below:

a) 1 and 2 only
b) 2 and 3 only
c) 1 and 3 only
d) All of the above

Q.74) Solution (c)

Explanation:

Kyoto Protocol	**Paris Agreement**
The Kyoto Protocol was established in 1997	The Paris Agreement was signed in 2016.
The Kyoto Protocol primarily targeted industrialised nations. Developing nations were exempt from the Kyoto Protocol	The Paris Agreement required both developing and developed nations to reduce their greenhouse emissions.
The objective of the Kyoto Protocol was to reduce greenhouse gases to 5.2%, below pre-1990 levels. Member of agreement can only emit Party's assigned amount.	The objective of the Paris Agreement was to prevent the average global temperature from rising more than 2 degrees Celsius above pre-industrial levels.
The Kyoto Protocol was aimed at 6 major greenhouse gases such as carbon dioxide, methane, sulphur hexafluoride, HFCs, PFCs and nitrous oxide.	The Paris Agreement was focused on reducing all anthropogenic greenhouse gases.
Targets of the Kyoto Protocol for many developed country was binding and Party can only emit its assigned amount, which were differentiated in Annex A and Annex B.	There are no Binding targets under Paris Agreement. These targets are voluntary and do not differentiate between developed and developing countries.
The first phase of the Kyoto Protocol lasted until	The goals of the Paris Agreement are set to be

2012.	achieved between 2025 and 2030.

Q.75) Consider the following statements about "The Intergovernmental Panel on Climate Change (IPCC)":

1. It was created by United Nation Environment Programme and World Meteorological Organisation in 1988.
2. It does not conduct its own research.
3. IPCC's reports are neutral, but not policy prescriptive.

Which of the above statements given above is/are correct?

a) 1 and 2 only
b) 1 and 3 only
c) 2 and 3 only
d) All of the above

Q.75) Solution (d)

Explanation:

The Intergovernmental Panel on Climate Change (IPCC)

- Created by the United Nations Environment Programme (UN Environment) and the World Meteorological Organization (WMO) in 1988, the IPCC has 195 Member countries.
- In the same year, the UN General Assembly endorsed the action by WMO and UNEP in jointly establishing the IPCC.
- The IPCC was created to provide policymakers with regular scientific assessments on climate change, its implications and potential future risks, as well as to put forward adaptation and mitigation options.
- Through its assessments, the IPCC determines the state of knowledge on climate change.
- It identifies where there is agreement in the scientific community on topics related to climate change, and where further research is needed.
- The reports are drafted and reviewed in several stages, thus guaranteeing objectivity and transparency.
- The IPCC does not conduct its own research.
- IPCC reports are neutral, policy-relevant but not policy-prescriptive.

- The assessment reports are a key input into the international negotiations to tackle climate change.

Q.76) Consider the following statements regarding Emission Gap Report, 2020:

1. India, China, Russia are expected to achieve the target mentioned in Paris Agreement.
2. All member of G20 cumulatively emit more than 75% of Global GHG emission.
3. Even if all unconditional commitments under Paris Agreement are implemented, temperature is expected to rise above 3 degree Celsius.

Which of the above statements given above is/are correct?

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

Q.76) Solution (d)

Explanation:

About Emission Gap Report:

- It is released by United Nation Environment Programme (UNEP).
- The report assesses the gap between anticipated emissions in 2030 and levels consistent with the 1.5°C and 2°C targets of the Paris Agreement'.

Trends as per Emission Gap Report, 2020:

- **Record high Green House Gas (GHG) emissions -** for the third consecutive year in 2019, global GHG emission has been highest.
- **Record carbon emission**: Fossil carbon dioxide (CO2) emissions (from fossil fuels and carbonates) dominate total GHG emissions.
- **G20 countries account for bulk of emissions**:
    - Over the last decade, the top four emitters (China, the United States of America, EU27+UK and India) have contributed to 55% of the total GHG emissions without Land Usage Change.

- The top seven emitters (including the Russian Federation, Japan and international transport) have contributed to 65%, with **G20 members accounting for 78%.**

- **Impact of Pandemic**: With reduced Mobility and reduced economic production, CO_2 Emission could decrease by 7%, while expected fall in non- CO_2 gas is smaller.
- World has to cut its emissions by 7.6% each year between 2020 and 2030 to get on track towards the 1.5°C temperature goal of the Paris Agreement.
- Even if all current unconditional commitments under the Paris Agreement are implemented, temperatures are expected to rise by 3.2°C.
- The levels of ambition in the Paris Agreement still must be roughly tripled for the 2°C pathway and increased at least fivefold for the 1.5°C Pathway.

Q.77) Consider the following statements about United Nation Environment Programme (UNEP):

1. United Nations Environment Assembly (UNEA) is governing body of the UNEP.
2. UNEP hosts Carpathian Convention.
3. UNEP publishes Global Environment Outlook.

Which of the above statements given above is/are correct?

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

Q.77) Solution (d)

Explanation:

The United Nations Environment Programme (UNEP) is the leading global environmental authority that sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the United Nations system, and serves as an authoritative advocate for the global environment.

United Nations Environment Assembly (UNEA) is governing body of the UNEP. UNEA is the world's highest-level decision-making body on the environment, with a universal membership of 193 members.

UNEP also host the secretariats of many multilateral environmental agreements. These include:

- The Convention on Biological Diversity
- The Convention on International Trade in Endangered Species of Wild Fauna and Flora
- The Minamata Convention on Mercury
- The Basel, Rotterdam and Stockholm Conventions
- The Vienna Convention for the Protection of Ozone Layer and the Montreal Protocol
- The Convention on Migratory Species
- The Carpathian Convention- sub regional treaty to foster the sustainable development and the protection of the Carpathian
- The Bamako Convention- Treaty of African nations prohibiting the import into Africa of any hazardous waste.
- The Tehran Convention- Protection of the Marine Environment of the Caspian Sea

Flagship Publication by UNEP: Emission Gap Report, Our Planet; Atlas of Our Changing Environment; Global Environment Outlook.

Q.78) Consider the following statements regarding Climate Performance Index, 2020?

1. It is released by Intergovernmental Panel on Climate Change
2. This index assesses all the members of the UNEP.
3. India for the first time entered in the top ten of the list.

Which of the above statement are incorrect?

a) 1 and 2 only
b) 1 and 3 only
c) 2 and 3 only
d) All of the above

Q.78) Solution (a)

Explanation:

About Climate Change Performance Index (CCPI)

It is published by Germanwatch, Climate Action Network International and the NewClimate Institute, annually. **(Hence, Statement 1 is not correct)**

It aims to enhance transparency in international climate politics and enables comparison of climate protection efforts and progress made by individual countries.

The Index covers 57 countries and the EU. **(not all member of UNEP are assessed under the index)**

The ranking results are defined by a country's aggregated performance in 14 indicators within the four categories o GHG

- Emission- 40%
- Renewable Energy – 20%
- Energy Use- 20%
- Climate Policy- 20%

India's performance → Improvement in Ranking: India's ranking improved two places, from 11th (CCPI 2019) to 9th (CCPI 2020) entering into top ten rankings for the first time. **(Hence, statement 3 is correct)**

Q.79) Consider the following statements regarding "Carbon Pricing Leadership Coalition (CPLC)":

1. It is an initiative started by UNFCCC, under which all the signatory of convention are its members.
2. It also bring business, civil society and academia and to understand carbon-pricing in better way.
3. From India, Indian Railways and Delhi Metro Rail Corporation also have joined it.

Which of the above statements are correct?

a) 1 and 2 only
b) 1 and 3 only
c) 2 and 3 only
d) All of the above

Q.79) Solution (c)

Explanation:

Carbon Pricing Leadership Coalition (CPLC)

- The Carbon Pricing Leadership Coalition (CPLC) is a voluntary initiative that catalyses action towards the successful implementation of carbon pricing around the world. **(Hence, statement 1 is incorrect)**
- The CPLC brings together leaders from government, business, civil society and academia to support carbon pricing, share experiences and enhance the global, regional, national and sub-national understanding of carbon pricing implementation.
- The CPLC Secretariat is administered by The World Bank Group.
- The CPLC was launched in United Nations Framework Convention on Climate Change 21st Conference of Parties (COP21) in 2015.
- As of 2019, the Coalition comprises 34 national and sub-national governments, 163 private sector organizations from a range of regions and sectors.
- From India, Delhi Metro Rail Corporation and Indian Railways are the government level partners.

Q.80) Which of the following Convention does not recognize Environmental refugee?

a) New York Declaration for Refugees and Migrants, UNHCR
b) The Global Compact on safe, orderly and regular migration
c) Nansen Initiative Protection Agenda for Cross Border Displaced Persons
d) UN Refugee Convention

Q.80) Solution (d)

Explanation:

New York Declaration for Refugees and Migrants, UNHCR (2016): It seeks to protect the human rights of all refugees and migrants, regardless of their status.

The Global Compact on safe, orderly and regular migration, 2018: It is the first-ever UN global agreement on a common approach to international migration in all its dimensions. The Global Compact for Safe, Orderly and Regular Migration is an intergovernmental negotiated agreement, prepared under the auspices of the United Nations, that describes itself as covering "all dimensions of international migration in a holistic and comprehensive manner". 'Climate refugees', migrants who move due to natural disasters and climate change, are now recognised under its Objective.

Nansen Initiative Protection Agenda for Cross Border Displaced Persons (2015): It's a state led consultative process to build consensus on a protection agenda addressing the needs of people

displaced across borders in the context of disasters and the effects of climate change.

Cross-border displaced who have migrated due to climate change are not recognised as refugees under the 1951 Refugee Convention or its 1967 protocol, and thus do not qualify for protection under national or international legal frameworks for refugee protection.

Q.81) With reference to National Disaster Management Authority consider the following statements?

1. It is an autonomous body under Ministry of Home Affairs
2. It is headed by Prime Minister.
3. NDMA is mandated to lay down the policies, plans and guidelines for Disaster Management.

Which of the above statements are correct?

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

Q.81) Solution (b)

Statement analysis

Statement 1: NDMA is an apex Body of Government of India under Ministry of Home Affairs. NDMA was established through the Disaster Management Act enacted by the Government of India on 23 December 2005. **It is a statutory body not autonomous body (bodies which are established independently and functions by its own law. Example - CSIR, AIIMS etc.). Hence statement is incorrect**

Statement 2: It **is headed by the Prime Minister of India** and can have up to nine other members. Since 2020, there have been five other members. NDMA has a vision to "build a safer and disaster resilient India by a holistic, pro-active, technology-driven and sustainable development strategy that involves all stakeholders and fosters a culture of prevention, preparedness and mitigation."

Statement 3: **NDMA is mandated to lay down the policies, plans and guidelines for Disaster Management. India envisions the development of an ethos of Prevention, Mitigation, Preparedness and Response.**

The Indian government strives to promote a national resolve to mitigate the damage and destruction caused by natural and man-made disasters, through sustained and collective efforts of all Government agencies, Non-Governmental Organizations and People's participation. This is planned to be accomplished by adopting a Technology-Driven, Pro-Active, Multi-Hazard and Multi-Sectoral strategy for building a Safer, Disaster Resilient and Dynamic India.

Q.82) Which of the following disaster is not monitored by Ministry of Home Affairs?

a) Cyclone
b) Hailstorm
c) Flood
d) Landslide

Q.82) Solution (b)

Explanation:

Department of Agriculture and Cooperation under Ministry of Agriculture (MoA) monitors relief activities for calamities associated with **drought, hailstorms, pest attacks and cold wave frost** while rest of the natural calamities are monitored by Ministry of Home Affairs.

Q.83) Which of the following agency is involved in preparation of Climate Vulnerability Assessment Map of India?

a) NITI Aayog
b) Department of Biotechnology
c) National Disaster Management Authority
d) Department of Science and Technology

Q.83) Solution (d)

Explanation:

Rising sea levels, increasing number of extreme weather events, urban floods, changing temperature and rainfall patterns are the impacts of climate change being felt in many parts of the country and not just coastal areas or hilly regions.

For preparing communities and people to meet the challenge arising out of such changes, information specific to a state or even district is needed because such impacts of climate change

are not uniform. In order to meet this need, a pan India **climate vulnerability assessment map** is being developed.

The map is being developed under a joint project of the Department of Science and Technology (DST) under the Union Ministry of Science and Technology and Swiss Agency for Development and Cooperation (SDC).

Such climate vulnerability atlas has already been developed for 12 states in the Indian Himalayan Region, using a common framework.

Q.84) Recently, a term called 'Dooms day Clock' was in news, it is associated with –

a) A countdown clock to warn people from upcoming world war.
b) An ecofriendly clock which uses solar power.
c) A hypothetical clock to measure the effect of greenhouse gases on environment.
d) Visual depiction of how vulnerable the world is to a climate or nuclear catastrophe.

Q.84) Solution (d)

Explanation:

The hands of the 'Doomsday Clock', a visual depiction of how vulnerable the world is to a climate or nuclear catastrophe, remained at '100 seconds to midnight' for the second consecutive year — the closest it has been to the symbolic annihilation of humanity.

- The Bulletin of the Atomic Scientists, founded by Albert Einstein and students from the University of Chicago in 1945, created the 'Doomsday Clock' as a symbol to represent how close the world is to a possible apocalypse.
- It is set annually by a panel of scientists, including 13 Nobel laureates, based on the threats — old and new — that the world faced in that year.
- When it was first created in 1947, the hands of the clock were placed based on the threat posed by nuclear weapons, which the scientists then perceived to be the greatest threat to humanity.
- Over the years, they have included other existential threats, such as climate change and disruptive technologies like artificial intelligence.

Q.85) Consider the following statements in context of Sustainable Agriculture:

1. Sustainable agriculture is aimed at meeting the needs of the present generation without endangering the resource base of the future generations.
2. Degradation of natural resources is the main issue threatening sustainable development of agriculture.

Which of the statements given above is/are correct?

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

Q.85) Solution (c)

Explanation:

Sustainable agriculture is a form of agriculture aimed at meeting the needs of the present generation without endangering the resource base of the future generations. It is considered as a system of cultivation with the use of manure, crop rotation and minimal tillage and with minimum dependence on synthetic fertilizers, pesticides and antibiotics.

- Agriculture has an enormous environmental footprint, playing a significant role in causing climate change, water scarcity, land degradation, deforestation and other processes. it is simultaneously causing environmental changes and being impacted by these changes.
- A sustainable agriculture approach seeks to utilize natural resources in such a way that they can regenerate their productive capacity, and also minimize harmful impacts on ecosystems beyond a field's edge.
- It is a balanced management system of renewable resources including soil, wildlife, forests, crops, fish, livestock, plant genetic resources and ecosystems without degradation and to provide food, livelihood for current and future generations maintaining or improving productivity and ecosystem services of these resources.
- Sustainable agriculture has to prevent land degradation and soil erosion. It has to replenish nutrients and control weeds, pests and diseases through biological and cultural methods.
- **Degradation of natural resources is the main issue threatening sustainable development of agriculture.**

Q.86) Who among the following is the head of Crisis Management Committee?

a) Prime Minister
b) Chairman of NITI Aayog
c) Cabinet Secretary
d) Home Minister

Q.86) Solution (c)

Explanation:

At the national level, Cabinet Committee on Security (CCS) and **National Crisis Management Committee (NCMC)** are the key committees involved in the top-level decision-making with regard to Disaster Management (DM).

NCMC deals with major crisis which have serious or national ramifications. It is headed by Cabinet secretary who functions directly under the Prime Minister and is the administrative head of the cabinet Secretariat.

Cabinet Secretary is also the ex-officio Chairman of the Civil Services Board.

Q.87) Which of the following are classified as Terrestrial disaster?

1. Floods
2. Blizzard
3. Drought
4. Landslides
5. Earthquake

Choose appropriate answer:

a) 1, 2 and 3 only
b) 2, 4 and 5 only
c) 1, 3 and 4 only
d) 4 and 5 only

Q.87) Solution (d)

Statement Analysis:

Classification of Natural Disasters

Atmospheric	Terrestrial	Aquatic	Biological
1. Blizzards 2. Thunder-storms 3. Lightening 4. Tornadoes 5. Tropical cyclone 6. Drought 7. Hailstorm 8. Frost, Heat wave 9. Cold Wave etc.	**1. Earthquakes** 2. Volcanic eruptions **3. Landslides** 4. Avalanches 5. Subsidence 6. Soil Erosion	1. Floods 2. Tidal waves 3. Ocean currents 4. Storm surge 5. Tsunami	Plants and Animals as colonisers (Locusts, etc.). Insects infestation—fungal, bacterial and viral diseases such as bird flu, dengue, etc.

Hence, Option (d) is correct.

Q.88) Consider the following statements:

1. Geological Survey of India is the nodal agency for the Indian government for landslide data repository and landslide studies.
2. UN Office for Disaster Risk Reduction (UNISDR) has been tasked to support the implementation, follow-up and review of the Sendai Framework.

Which of the statements given above is/are correct?

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

Q.88) Solution (c)

Explanation:

Statement 1: Geological Survey of India as a Nodal Agency is responsible for:

- Coordinating and undertaking geological studies for landslide hazard mitigation
- Carrying out landslide hazard zonation

- **Monitoring landslide**s and avalanches
- Studying the factors responsible for sliding and suggesting precautionary as well as preventive measure National Core Group has finalized the action plan for **landslide studies** with inputs of GSI and other organization.

Statement 2: The United Nations Office for Disaster Risk Reduction (UNDRR) was created in December 1999 to ensure the implementation of the International Strategy for Disaster Reduction. UNDRR (formerly UNISDR) is part of the United Nations Secretariat and it supports the implementation & review of the Sendai Framework for Disaster Risk Reduction. **Hence statement 2 is correct.**

Q.89) Consider the following statements with reference to National Disaster Response Fund (NDRF)

1. NDRF amount can be spent towards the mitigation of disaster risks.
2. The primary purpose of NDRF is to supplement the SDRF, in case there is a calamity of "severe nature".
3. NDRF is located in the "Public Accounts" of Government of India under "Reserve Funds not bearing interest"

Which of the statements given above is/are correct?

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

Q.89) Solution (b)

Basic information:

National Disaster Response Fund is defined in Section 46 of the Disaster Management Act, 2005 (DM Act) as a fund managed by the Central Government for meeting the expenses for emergency response, relief and rehabilitation due to any threatening disaster situation or disaster.

Currently, funds contributed to the Prime Minister's Relief Fund or the State Chief Minister's Relief Fund are exempt from income tax.

Statement Analysis:

Statement 1: NDRF amount **can be spent only towards meeting the expenses for emergency response, relief and rehabilitation. For projects exclusively for the purpose of mitigation**, i.e, measures aimed at reducing the risk, impact or effect of a disaster or threatening disaster situation a **separate fund called National Disaster Mitigation Fund** has to be constituted. **Hence, statement 1 is incorrect.**

Statement 3: **The primary purpose of NDRF is to supplement the SDRF, in case there is a calamity of "severe nature"** which requires assistance over and above the funds available under SDRF. **Hence, statement 2 is correct.**

The memorandum of the state government for additional assistance from NDRF is examined by the MHA/MoA as the case may be, and in case there is any shortage, a central team is deputed for making an on the spot assessment. The recommendations of the central team are examined and the extent of assistance and expenditures which can be funded from the NDRF is recommended by the National Executive Committee (NEC) constituted for this purpose under the DM Act. Based on these recommendations, a high level committee (HLC) approves the quantum of immediate relief to be released from NDRF.

Statement 2: NDRF is **located in the "Public Accounts"** of Government of India under "Reserve Funds not bearing interest**". Hence, statement 3 is correct.**

Q.90) Consider the following statements with reference to Regional Integrated Multi-Hazard Early Warning System (RIMES) for Africa and Asia:

1. It is an international and intergovernmental institution, owned by its member states and managed by UN.
2. RIMES operates from its regional early warning center located at the campus of the Asian Institute of Technology in Pathumthani, Thailand.

Which of the above given statements is/are correct?

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

Q.90) Solution (b)

Explanation:

The Regional Integrated Multi-Hazard Early Warning System for Africa and Asia **(RIMES) is an international and intergovernmental institution, owned and managed by its Member States**, for the generation and application of early warning information. **Hence statement 1 is incorrect.**

- RIMES evolved from the efforts of countries in Africa and Asia, in the aftermath of the 2004 Indian Ocean tsunami, to establish a regional early warning system within a multi-hazard framework for the generation and communication of early warning information, and capacity building for preparedness and response to trans-boundary hazards.
- RIMES was established on 30 April 2009, and was registered with the United Nations on 1 July 2009.
- **RIMES operates from its regional early warning center located at the campus of the Asian Institute of Technology in Pathumthani, Thailand**. Hence, **statement 2 is correct.**

Q.91) Consider the following statements with reference to Sendai Framework for disaster risk reduction

1. It is a 15 year long, voluntary, nonbinding agreement which recognizes that state has a primary role in disaster risk reduction.
2. It is a successor instrument to the Yokohama Framework for Action.
3. India is a signatory to this framework.

Which of the statements give above is/are correct?

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

Q.91) Solution (c)

Basic Information:

The **Sendai Framework for Disaster Risk Reduction 2015-2030 outlines** seven clear targets and four priorities for action to prevent new and reduce existing disaster risks: (i) Understanding disaster risk; (ii) Strengthening disaster risk governance to manage disaster risk; (iii) Investing in disaster reduction for resilience and; (iv) Enhancing disaster preparedness for effective response, and to "Build Back Better" in recovery, rehabilitation and reconstruction.

It aims to achieve the substantial reduction of disaster risk and losses in lives, livelihoods and

health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries over the next 15 years.

The Framework was adopted at the Third UN World Conference on Disaster Risk Reduction in Sendai, Japan, on March 18, 2015.

Statement analysis

Statement 1: Sendai framework is **voluntary and non-binding agreement which recognizes that state has primary role to play in disaster risk reduction** by sharing responsibilities with other stakeholders including Local government, private sector along with others. **Hence statement 1 is correct.**

Statement 2: It **is the successor agreement to the Hyogo Framework for Action (2005–2015),** which had been the most encompassing international accord to date on disaster risk reduction. **Hence statement 2 is incorrect**

Statement 3: **India is a signatory to Sendai Framework**. United Nations Office for Disaster Risk Reduction oversees the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030, supporting countries in its implementation, monitoring and sharing what works in reducing existing risk and preventing the creation of new risk. **Hence statement 3 is correct.**

Q.92) The term 'Fujiwara effect' was in news with reference to

a) Effect of use nuclear energy
b) Collusion of two cyclone
c) Biodiversity loss caused due erratic rain
d) Quantum technology application

Q.92) Solution (b)

Explanation:

The Fujiwhara effect also known as Fujiwhara interaction or binary interaction, **is a phenomenon that occurs when two nearby cyclonic vortices move around each other and close the distance between the circulations** of their corresponding low-pressure areas.

The effect is named after Sakuhei Fujiwhara, the Japanese meteorologist who initially described the effect.

Extratropical cyclones can exhibit the binary interaction when within a distance of 2,000 km of each other. Tropical cyclones exhibit this type of effect when separated by a distance of less

than 1,400 km.

Q.93) Consider the following statements

1. Under 15th finance commission in grant for disaster risk management more than two-third fund is for disaster mitigations.
2. Bioswales system is suggested as a potential solution for urban floods.

Which of the statement give above is/are correct?

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

Q.93) Solution (b)

Explanation:

Statement 1: The Commission recommended setting up National and State Disaster Management Funds (NDMF and SDMF) for the promotion of local-level mitigation activities. The Commission has recommended retaining the existing cost-sharing patterns between the centre and states to fund the SDMF (new) and the SDRF (existing). The cost-sharing pattern between centre and states is (i) 75:25 for all states, and (ii) 90:10 for north-eastern and Himalayan states. As can be seen below majority of amount is spent towards relief and Reconstruction (80%)- and not mitigation (20%). **Hence statement 1 is incorrect.**

Table 2: Grants for disaster risk management (In Rs crore)

Funding Windows	National corpus	States' corpus
Mitigation (20%)	2,478	5,797
Response (80%)	9,912	23,186
(i) Response and Relief (40%)	4,956	11,593
(ii) Recovery and Reconstruction (30%)	3,717	8,695
(iii) Capacity Building (10%)	1,239	2,998
Total	**12,390**	**28,983**

Sources: Report for the year 2020-21, 15th Finance Commission; PRS.

Statement 2: Bioswales are vegetated, shallow, landscaped depressions designed to capture, treat, and infiltrate stormwater runoff as it moves downstream. They are typically sized to treat the water quality event, also known as the "first flush," which is the first and often most polluted volume of water resulting from a storm event. **Bioswales are the most effective type of green infrastructure facility in slowing runoff velocity and cleansing water while recharging the underlying groundwater table. Many cities are considering it for its potential in managing Urban floods. Hence, statement 2 is correct.**

Q.94) The term 'Torrefecation technology' was in news with reference to

a) Big data analytics
b) Terminator seeds
c) Solution to stubble burning
d) GM Crops

Q.94) Solution (c)

Explanation:

Pollution from **stubble burning** in winter is the key contributor to the sharp decline in air quality in Delhi. But stubble burning continues unabated. To find a solution to this issue, India is testing a Swedish technology — **torrefaction that can convert rice stubble into 'bio-coal'.**

Torrefaction is a thermochemical process typically at 200-350 °C in the absence of oxygen, at atmopsheric pressure with low particle heating rates and a reactor time of one hour. The process causes biomass to partly decompose, creating torrefied biomass or char, also referred to as 'biocoal'. Biocoal has a higher energy content per unit volume, and torrefaction followed by pelletisation at the harvest sites facilitates transport over longer distances. It also avoids problems associated with decomposition of biomass during storage. Hence the benefits of torrefaction may outweigh the additional cost in many cases.

Q.95) Bioremediation may not be best suited for removal of which of the following

a) Uranium
b) Cadmium
c) Chromium
d) All of the above

Q.95) Solution (d)

Explanation:

Bioremediation is a term that refers to a number of remediation technologies for treatment of both soil and groundwater using microorganisms.

- Bioremediation is typically used to treat sites contaminated with organic substances . bioremediation uses microbes (e.g. bacteria, yeast, and fungi) to 'digest' toxic organic contaminants.
- The process of breaking down organic contaminants with microorganisms is referred to as biodegradation. This can occur in the presence of oxygen or without oxygen, known as aerobic and anaerobic conditions, respectively.
- Bioremediation provides a good cleanup strategy for some types of pollution, but as you might expect, it will not work for all. For example, **bioremediation may not provide a feasible strategy at sites with high concentrations of chemicals that are toxic to most microorganisms.** These chemicals include metals such as **cadmium or lead**, and salts such as sodium chloride.
- **Heavy metals including cadmium, chromium, lead and uranium are elements so they cannot be biodegraded**. However, bioremediation processes can potentially be used to reduce the mobility of these material in the subsurface, reducing the potential for human and environmental exposure. The mobility of certain metals including chromium (Cr) and uranium (U) varies depending on the oxidation state of the material.

Q.96) Which of the following factors are responsible for Glacial Lake Outbursts Floods?

1. Glacial retreat due to climate change.
2. Long-term dam degradation
3. Black carbon which melts ice on mountains due to albedo effect.

Choose correct answer:

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

Q.96) Solution (d)

Basic informstion:

When glaciers melt, the water in glacial lakes accumulates behind loose, natural "glacial/moraine dams" made of ice, sand, pebbles and ice residue. A GLOF refers to the flooding that occurs when the water dammed by a glacier or a moraine is released suddenly.

Unlike earthen dams, the weak structure of the moraine dam leads to the abrupt failure of the dam on top of the glacial lake, which holds large volume of water.

Statement Analysis

Following factors can lead to Glacial lake Outburst floods

- **Retreat of glaciers due to climate change** and change in radiative balance in the region in the wake of global warming.
- **Increasingly erratic and unpredictable monsoon rainfall patterns** and increased climate variability.
- Anthropogenic activities such as **mass tourism; developmental interventions** such as roads and hydropower projects; and the practice of slash and burn type of farming in certain pockets of the Indian Himalayan region.
- Black carbon also plays important factor which melts the ice on the mountain due to albedo effect.
- Rapid slope movement into lakes.
- Other Factors like cascading processes (flood from a lake situated upstream), earthquake, blocking of subsurface outflow tunnels, and **long-term dam degradation** also trigger GLOFS.

So, all the statements are correct.

Q.97) Which of the following statements with respect to Coalition for Disaster Resilient Infrastructure (CDRI) is/are correct?

1. It is a voluntary international grouping linking government and UN agencies only.
2. It is second major coalition launched by India outside the UN, after the International Solar Alliance.
3. Its secretariat is in New Delhi.

Select the appropriate answer using the code given below:

a) 1 and 2 only
b) 3 only

c) 2 and 3 only
d) 1, 2 and 3

Q.97) Solution (c)

Basic Information:

The Coalition for Disaster Resilient Infrastructure (CDRI) is a Voluntary partnership of national governments, UN agencies and programmes, multilateral development banks and financing mechanisms, the private sector, and knowledge institutions that aims to promote the resilience of new and existing infrastructure systems to climate and disaster risks in support of sustainable development. **Hence, statement 1 is incorrect.**

- CDRI promotes rapid development of resilient infrastructure to respond to the Sustainable Development Goals' imperatives of expanding universal access to basic services, enabling prosperity and decent work.
- It was launched by the Indian Prime Minister Narendra Modi at the 2019 UN Climate Action Summit in September 2019.
- The World Bank and the Green Climate Fund also supported the launch.
- Its secretariat is in **New Delhi. Hence, statement 3 is correct.**
- The CDRI is the **second major coalition launched by India outside of the UN, the first being the International Solar Alliance. Hence, statement 2 is correct.**
- Both of them are seen as India's attempts to obtain a global leadership role in climate change matters.

Q.98) What are the benefits of vertical farming?

1. Increased crop yield
2. Ability to cultivate large variety of crop at once.
3. Start-up cost is low compared to traditional farming.

Choose appropriate code:

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

Q.98) Solution (a)

Basic Information:

In vertical farming, crops are grown indoors, under artificial conditions of light and temperature.t aims at higher productivity in smaller spaces. It uses soil-less methods such as hydroponics, aquaponics and aeroponics.

Japan has been one of the early pioneers in vertical farming. It holds the largest share in the global vertical farming market. Now, countries like Denmark and USA are also taking up vertical farming.

Statement Analysis

Benefits of vertical farming

- Vertical farming uses significantly less water and pesticides than traditional agricultural methods.
- Being indoors, the crops aren't subject to seasons and hence **give high productivity year-round.** Lettuces, tomatoes and green crops can be produced through this practice.
- **The increased ability to cultivate a larger variety of crops at once** because crops do not share the same plots of land while growing is another sought-after advantage.
- Because of its limited land usage, vertical farming is less disruptive to the native plants and animals, leading to further conservation of the local flora and fauna.

Drawbacks

- **Vertical farming technologies face economic challenges with large start-up costs** compared to traditional farms.
- Vertical farms also face large energy demands due to the use of supplementary light like LEDs.
- Moreover, if non-renewable energy is used to meet these energy demands, vertical farms could produce more pollution than traditional farms or greenhouses.

Q.99) Kuttanad in India is primarily known for

a) Intricate tribal art
b) Salt production region
c) Below sea level farming

d) Has got GI for its silk saree

Q.99) Solution (c)

Explanation:

Kuttanad is a delta region of about 900 sq. km situated in the west coast of Kerala State, India. The area is a larger mosaic of fragmented landscape patches and varied ecosystems such as coastal backwaters, rivers, vast stretches of paddy fields, marshes, ponds, garden lands, edges, corridors and remarkably networked water ways.

The Kuttanad Below Sea-level Farming System (KBSFS) is unique, as it is the only system in India that practices rice cultvation below sea level. The major land use structure of KBSFS is flat stretches of rice fields in about 50,000 ha of mostly reclaimed delta swamps. The rice fields, which are popularly known as "Puncha Vayals" exist in three landscape elements: Karapadam (upland rice fields), Kayal (wetland rice fields) and Kari (land buried with black coal like materials).

Q.100) Which of the following are advantages of zero tillage in agriculture.

1. Increase in organic matter content
2. Reduction in the crop duration
3. Low amount of nitrogen needed

Select the correct code:

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

Q.100) Solution (a)

Basic introduction:

Zero tillage is the process where the crop seed will be sown through drillers without prior land preparation and disturbing the soil where previous crop stubbles are present. Zero tillage not only reduce the cost of cultivation.

Statement analysis:

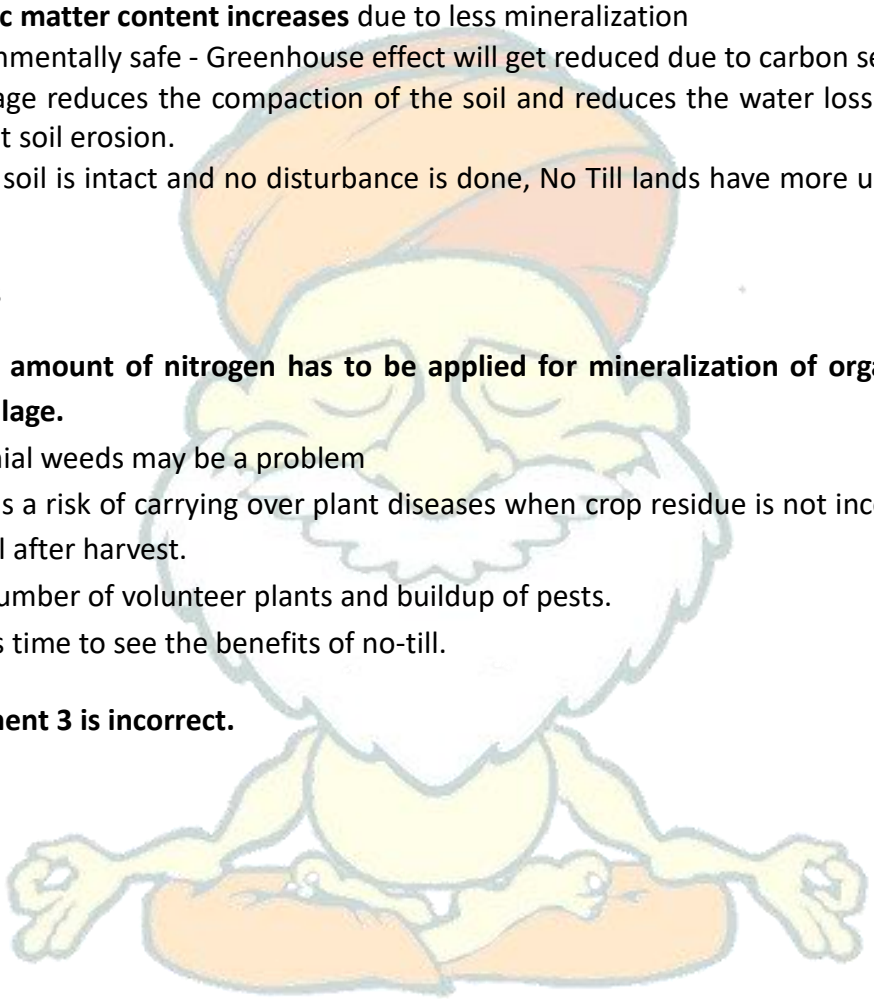
Advantages of Zero Tillage Farming

- **Reduction in the crop duration** and thereby early cropping can be obtained to get higher yields.
- Reduction in the cost of inputs for land preparation and therefore a saving of around 80%.
- Zero tilled soils are homogenous in structure with more number of earthworms.
- Residual moisture can be effectively utilized and number of irrigations can be reduced.
- **Organic matter content increases** due to less mineralization
- Environmentally safe - Greenhouse effect will get reduced due to carbon sequestration.
- No tillage reduces the compaction of the soil and reduces the water loss by runoff and prevent soil erosion.
- As the soil is intact and no disturbance is done, No Till lands have more useful flora and fauna.

Disadvantages

- **Higher amount of nitrogen has to be applied for mineralization of organic matter in zero tillage.**
- Perennial weeds may be a problem
- There is a risk of carrying over plant diseases when crop residue is not incorporated into the soil after harvest.
- High number of volunteer plants and buildup of pests.
- It takes time to see the benefits of no-till.

Hence, statement 3 is incorrect.



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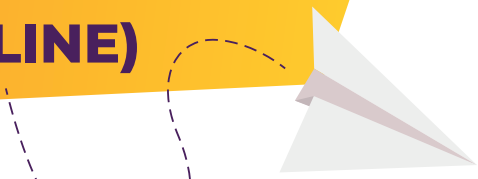

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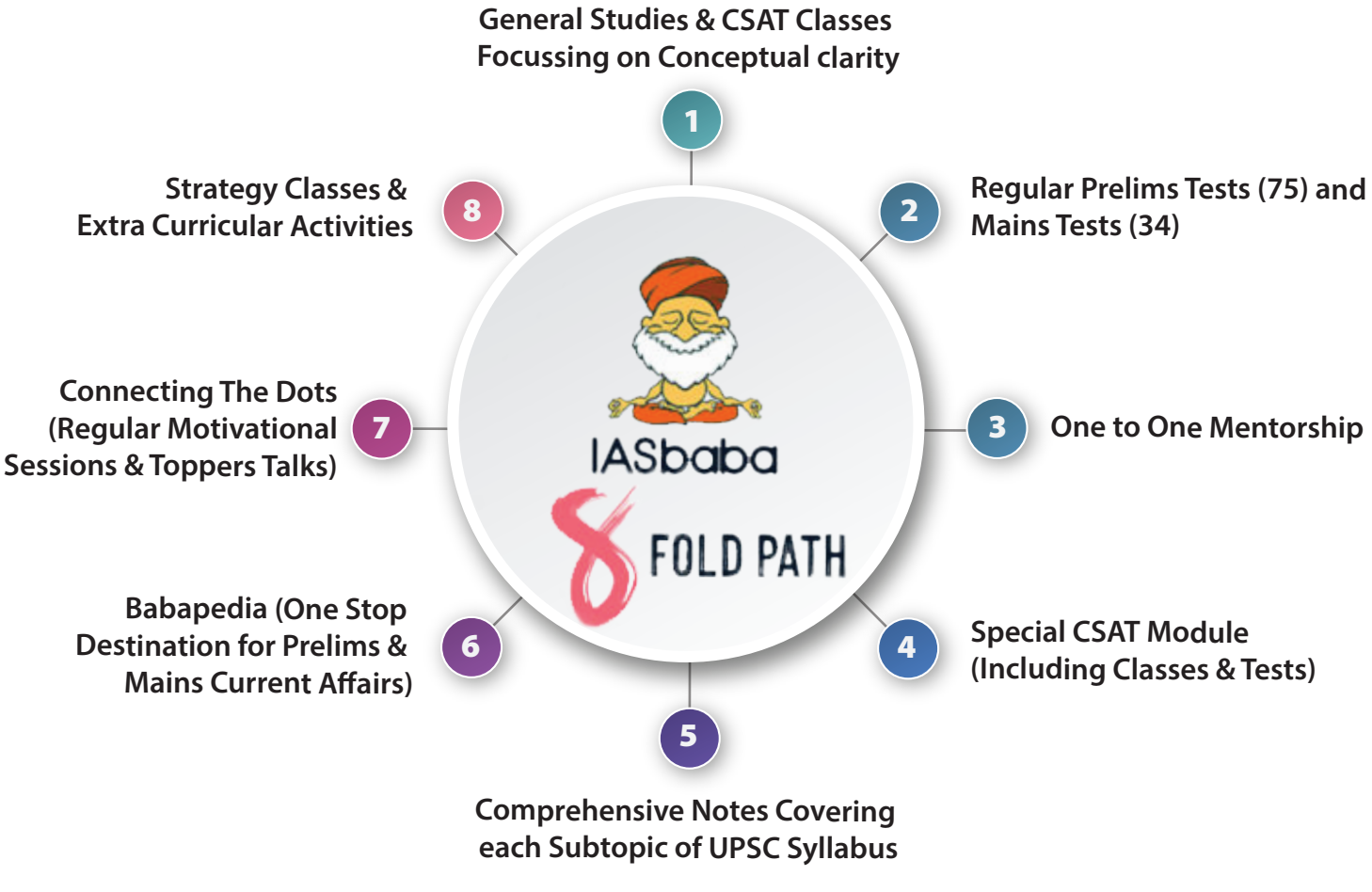

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