

Q.1) 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.1) 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.2) Consider the following statement about Biome

1. Biomes are greatly influenced by latitudes.
2. Two biomes can be alike 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 statements given above is/are correct?

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

Q.2) 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.3) 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

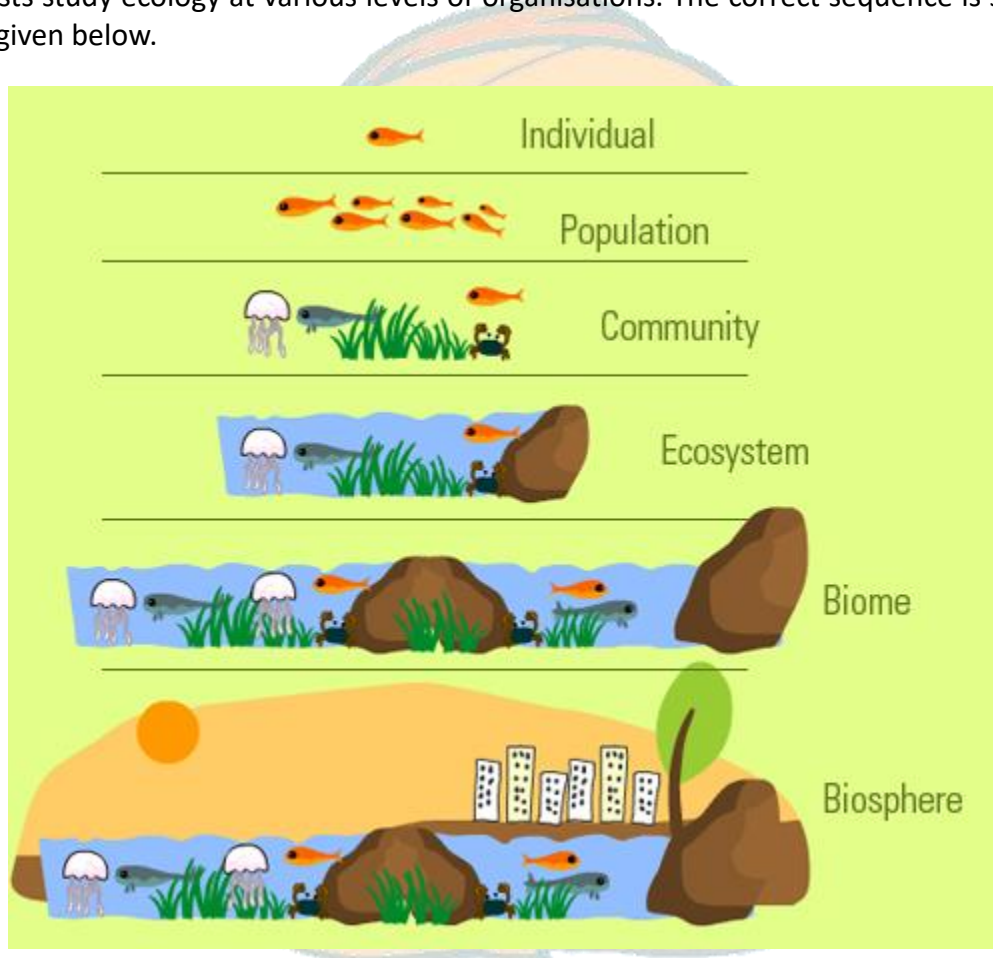
d) Biosphere – Community – Biome – Ecosystem

Q.3) 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.4) 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 statements given above is/are correct?

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

Q.4) 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.5) Consider the following biomes and dominant flora and fauna found there:

<i>(Biomes)</i>	:	<i>(Flora and Fauna)</i>
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 pairs 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.5) 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.6) 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.6) 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.7) 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 1 and 2
- d) None of the above

Q.7) 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.8) 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.8) 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.9) Which of the following statements with reference to Aquatic ecosystem is/are 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.9) 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.10) 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.10) 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.11) 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.11) 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.12) 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 option:

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

Q.12) 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.13) 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 Eutrophication 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.13) 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 increases the amount of dissolved oxygen in the water bodies.

The pH level of ocean decreases due to Eutrophication 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.14) 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.14) 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.15) 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.15) 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.16) Following are the given pair of wetlands and their location:

<i>Wetlands</i>	:	<i>location</i>
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.16) 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. 17) *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. 17) 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.18) 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.18) 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.19) 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.19) 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.20) Which of the following are said to be the effects of Eutrophication?

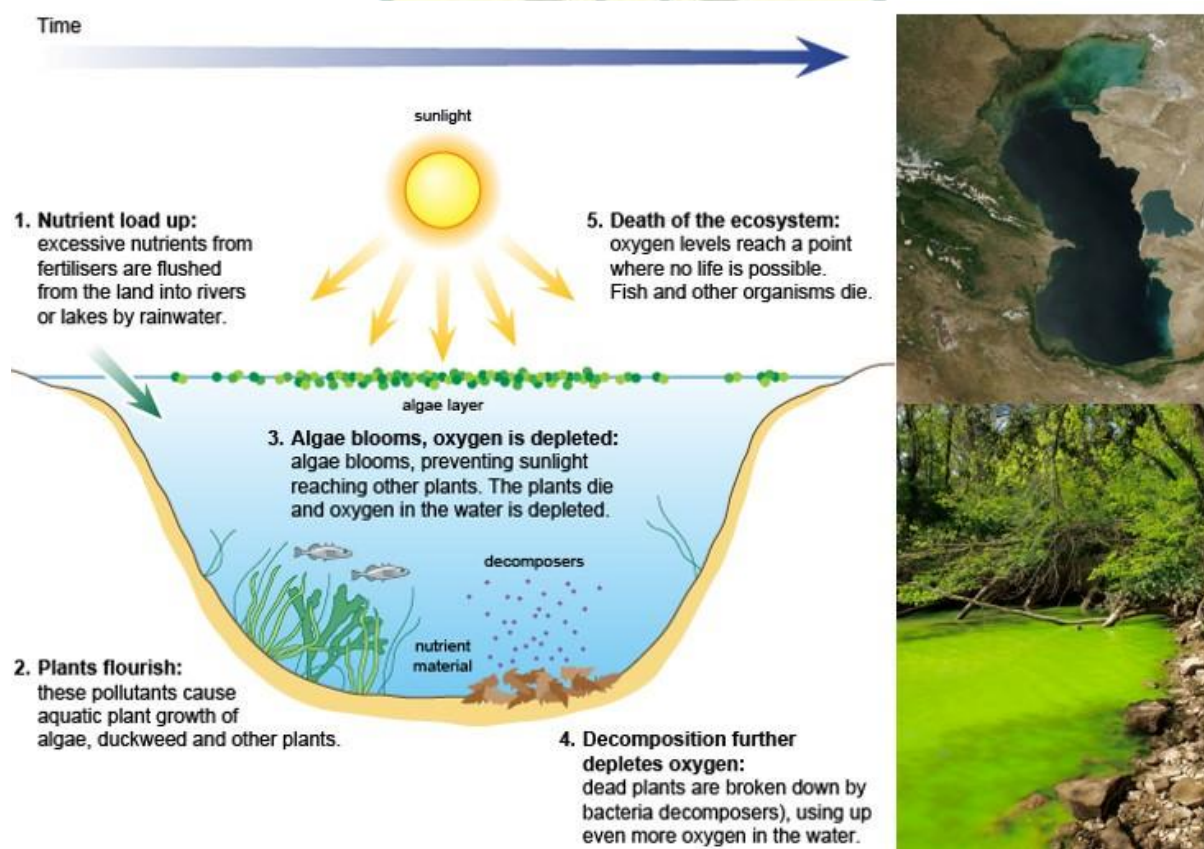
1. It changes the nature of water body to marsh due to creation of detritus layer
2. It may lead to the invasion of new species
3. It leads to the loss of coral reefs

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.20) 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.21) With reference to Supply Chain Resilience Initiative (SCRI), which of the following statements is/are correct?

1. It is an approach that helps a country to ensure that it has diversified its supply risk across a clutch of supplying nations.
2. Japan has mooted the SCRI as a trilateral approach to trade, with India and Australia as the key-partners.

Select the correct answer using the code given below:

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

Q.21) Solution (c)

Statement 1	Statement 2
Correct	Correct
Supply Chain Resilience Initiative (SCRI) aims to reduce the dependency on a single nation. It is an approach that helps a country to ensure that it has diversified its supply risk across a clutch of supplying nations instead of being dependent on just one or a few. Objective is to attract FDI to turn the Indo-Pacific	Japan has mooted the Supply Chain Resilience Initiative (SCRI) as a trilateral approach to trade, with India and

into an economic powerhouse and build a mutually complementary relationship among partner countries.

Australia as the key-partners.

Q.22) With reference to recently flight tested Hypersonic Technology Demonstrator Vehicle (HSTDV), consider the following statements:

1. It is an unmanned scramjet vehicle.
2. India became the fourth country to have demonstrated this technology.

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.22) Solution (c)

Statement 1	Statement 2
Correct	Correct
The Defence Research and Development Organisation (DRDO) recently successfully flight tested the Hypersonic Technology Demonstrator Vehicle (HSTDV). HSTDV is an unmanned scramjet vehicle with a capability to travel at six times the speed of sound. The test was conducted from Wheeler Island, off the coast of Odisha.	The indigenous development of the technology will also boost the development of the systems built with hypersonic vehicles at its core, including both offensive and defensive hypersonic cruise missile systems and also in the space sector. India became the fourth country to have demonstrated this technology after the USA, Russia and China.

Q.23) The National Strategy for Financial Education (NSFE) for the period 2020-2025 has been prepared by which of the following?

- a) Reserve Bank of India (RBI)
- b) Department of Financial Services

- c) National Informatics Centre (NIC)
- d) National Centre for Financial Education (NCFE)

Q.23) Solution (d)

- Reserve Bank of India (RBI) released the National Strategy for Financial Education (NSFE): 2020-2025.
- NSFE intends to empower various sections of the population to develop knowledge, skills, attitude and behaviour which are needed to manage their money better and to plan for their future.
- NSFE recommends multi-stakeholder-led approach for creating a financially aware and empowered India.
- **NSFE for the period 2020-2025 has been prepared by the National Centre for Financial Education (NCFE)** in consultation with all the Financial Sector Regulators viz. RBI, SEBI, IRDAI and PFRDA etc. under the aegis of the Technical Group on Financial Inclusion and Financial Literacy (TGFIFL).

Q.24) Consider the following pairs:

Naval Exercise of Indian Navy	Country involved
1. INDRA	France
2. PASSEX	USA
3. JIMEX	Japan

Which of the pairs given above are *incorrectly* matched?

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

Q.24) Solution (b)

- **INDRA 2020** is a bilateral naval exercise India and Russia.

- The Indian and the Australian navies are undertaking Passage Exercise or **PASSEX** exercises in the Indian Ocean.
- The 4th edition of India - Japan Maritime bilateral exercise **JIMEX**, will be held in North Arabian Sea.

Q.25) The Osaka declaration sometimes seen in news is related to which of the following?

- a) Digital Economy
- b) Carbon Capture and Storage
- c) Biodiversity Conservation
- d) Sustainable Modes of Transport

Q.25) Solution (a)

- India recently refused to become a signatory to the Osaka declaration on digital economy which proposes the concept of Data Free Flow with Trust (DFFT).
- **Osaka Declaration on Digital Economy** was signed at the sidelines of the G20 summit in 2019, by some G20 leaders and other countries who are currently participating in the informal plurilateral negotiations on e-commerce at the World Trade Organization.
- Osaka Track relates to finalizing international rules for trade-related aspects of electronic commerce at the WTO.

Q.26) With reference to Green Term Ahead Market (GTAM), consider the following statements:

1. GTAM will provide an exclusive platform for long-term trading of Renewable Energy.
2. Transactions through GTAM will be bilateral in nature.
3. Energy scheduled through GTAM contract shall be considered as deemed Renewable Purchase Obligations (RPO) compliance of the buyer.

Which of the statements given above is/are correct?

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

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

Q.26) Solution (c)

Statement 1	Statement 2	Statement 3
Incorrect	Correct	Correct
Green Term Ahead Market (GTAM) is an alternative new model introduced for selling off the power by the renewable developers in the open market without getting into long term PPAs. It will provide an exclusive platform for short-term trading of Renewable Energy.	Transactions through GTAM will be bilateral in nature with clear identification of corresponding buyers and sellers; there will not be any difficulty in accounting for Renewable Purchase Obligations (RPO).	GTAM contracts will be segregated into Solar RPO & Non-Solar RPO as RPO targets are also segregated. Energy scheduled through GTAM contract shall be considered as deemed RPO compliance of the buyer.

Q.27) India has launched Green Strategic Partnership for delivering sustainable solutions with which of the following country?

- a) United Kingdom
b) Germany
c) France
d) Denmark

Q.27) Solution (d)

- India and the Kingdom of **Denmark** have launched the **Green Strategic Partnership** for delivering sustainable solutions to India.
- The Partnership will focus on expanding economic ties, green growth, and cooperation on global challenges such as climate change.
- Danish companies with niche technologies and expertise have offered to help India in meeting its air pollution control targets, Covid-19 pandemic and cooperation in water efficiency and water loss.

- The creation of India-Denmark energy parks in areas with large numbers of Danish firms and an India-Denmark skill institute to train Indian manpower has been proposed.

Q.28) With reference to State Disaster Response Fund (SDRF), consider the following statements:

1. It is a Constitutional Fund.
2. Majority of SDRF allocation is contributed by the Central Government.
3. States can spend upto 50 percent of SDRF for COVID-19 relief.

Which of the statements given above is/are correct?

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

Q.28) Solution (b)

Statement 1	Statement 2	Statement 3
Incorrect	Correct	Correct
The State Disaster Response Fund (SDRF) was constituted under Section 48 (1) (a) of the Disaster Management Act, 2005. It is the primary fund available with State Governments for responses to notified disasters.	The Central Government contributes 75% of SDRF allocation for general category States/UTs and 90% for special category States/UTs (NE States, Sikkim, Uttarakhand, Himachal Pradesh, Jammu and Kashmir).	Recently, the limit of using the State Disaster Response Fund (SDRF) for COVID-19 specific infrastructure has been increased from 35% to 50%. The decision will help States have more finances at their disposal to fight the virus.

Q.29) Which of the following regions is recently declared as Protected Special Agriculture Zone?

- a) Lower Gangetic Plain Region

- b) Cauvery Delta
- c) Krishna Godavari Basin
- d) Punjab Plain

Q.29) Solution (b)

- **Tamil Nadu CM declared Cauvery Delta as Protected Special Agriculture Zone (PSAZ).** The protected zone will include Thanjavur, Tiruvarur, Nagapattinam districts and delta regions of Trichy, Ariyalur, Cuddalore and Pudukkottai.
- State government enacted the Tamil Nadu Protected Agricultural Zone Development (TNPAZD) Act, 2020, with objectives to use the available agricultural lands for sustainable development of agriculture and ensure that the agricultural activities were not unduly constrained by non-agricultural use or other development objectives.
- PSAZ is aimed at protecting the Cauvery delta region for the future, fulfilling TN's food requirements and ensuring the welfare of delta farmers. It has recognised farmer concerns about hydrocarbon exploration and accorded primacy to food security.

Q.30) With reference to Domestic Systemically Important Insurers (D-SIIs), which of the following statements is *INCORRECT*?

- a) D-SIIs shall be listed on a biennial basis.
- b) D-SIIs are identified by the Insurance Regulatory and Development Authority of India (IRDAI).
- c) D-SIIs are subjected to enhanced regulatory supervision.
- d) Distress or failure of D-SIIs would cause a significant dislocation in the domestic financial system.

Q.30) Solution (a)

- The Insurance Regulatory and Development Authority of India (IRDAI) has identified the Life Insurance Corporation of India (LIC), General Insurance Corporation of India (GIC) and The New India Assurance Co. as Domestic Systemically Important Insurers (D-SIIs) for 2020-21.

- D-SIIs refer to insurers of such size, market importance and domestic and global interconnectedness whose distress or failure would cause a significant dislocation in the domestic financial system.
- D-SIIs are perceived as insurers that are too big or too important to fail. Such a perception and the expectation of government support may amplify risk taking, reduce market discipline, create competitive distortions and increase the possibility of distress in future.
- The three public sector insurers shall raise the level of corporate governance, identify all relevant risks and promote a sound risk management culture. As D-SIIs, they will also be subjected to enhanced regulatory supervision. **D-SIIs shall be listed on an annual basis. Hence Option (a) is incorrect.**
- Size in terms of total revenue, including premium underwritten and the value of assets under management are among the parameters on which the insurers are identified.
- Their continued functioning is critical for the uninterrupted availability of insurance services to the national economy.

Directions for the following 2 (two) items:

Read the following passage and answer the items that follow. Your answers to these items should be based in the passage only.

The Indian middle class consist of so many strata that it defies categorisation under a single term class, which would imply a considerable degree of homogeneity. Yet two paradoxical features characterise its conduct fairly uniformly; extensive practice and intensive abhorrence of corruption. In the several recent surveys of popular perceptions of corruptions, politicians of course invariably and understandably top the list, closely followed by bureaucrats, policemen, lawyers, businessmen and others. The quintessential middle class, if teachers do not figure high on this priority list, it is not for lack of trying, but for lack of opportunities. Over the years, the sense of shock over acts of corruption in the middle class has witnessed a steady decline, as its ambitions for a better material life have soared but the resources for meeting such ambitions have not kept pace. What is fascinating however is the intense yearning of this class for a clean corruption less politics and society, a yearning that has again and again surfaced with any figure public or obscure, focus on his mission of eradicating corruption. Even the repeated failure of this promise on virtually every man's part has not subjected it to the law of diminishing returns.

Q.31) The intense Middle Class intensely yearns for

- a) better material resources
- b) better material resources
- c) clean honest society
- d) law of increasing returns

Q.31) Solution (c)

What is fascinating however is the intense yearning of this class for a clean corruption less politics and society...Hence option 'c' is the correct answer.

Q.32) Teachers are not high on the list of corruption because they do not have

- a) courage
- b) opportunities
- c) support
- d) ambition

Q.32) Solution (b)

Self- explanatory

Q.33) The salaries A, B, C are in the ratio 2 : 3 : 5. If the increments of 15%, 10% and 20% are allowed respectively in their salaries, then what will be new ratio of their salaries?

- a) 3 : 3 : 10
- b) 10 : 11 : 20
- c) 23 : 33 : 60
- d) Cannot be determined

Q.33) Solution (c)

Let A = 2k, B = 3k and C = 5k.

A's new salary = $(115/100) * 2k = 23k/10$

B's new salary = $(110/100) * 3k = 33k/10$

C's new salary = $(120/100) * 5k = 6k$

Therefore, the new ratio = $[(23k/10) : (33k/10) : 6k] = 23:33:60$

Q.34) What is the speed of the train?

Statement I: The train crosses a signal pole in 18 seconds.

Statement II: The train crosses a platform of equal length in 36 seconds.

Statement III: Length of the train is 330 metres.

- a) Statement I and II only are sufficient
- b) Statement II and III only are sufficient
- c) Statement I and III only are sufficient
- d) Statement III and either Statements I or II are sufficient

Q.34) Solution (d)

Let the speed of the train be x metres/sec.

Time taken to cross a signal pole = Length of the train/Speed of the train

Time taken to cross a platform = (Length of the train + Length of the Platform)/Speed of the train

Length of train = 330 m.

Statements I and III give, $18 = 330/x \implies x = 330/18 = 55/3$ m/sec

Statements II and III give, $36 = 2*(330/x) \implies x = 55/3$ m/sec

Therefore, option d is correct.

Q.35) A person covered a distance from P to Q at a speed of 40 kmph. On the return journey, he covered three-fifths of the distance in two-third of the time he took to cover from P to Q. At what speed should he travel to complete the remaining journey from Q to P, in the remaining time?

- a) 45 km/hr
- b) 48 km/hr
- c) 54 km/hr
- d) 61 km/hr

Q.35) Solution (b)

Let the time taken to cover the distance from P to Q be 't' hours and the distance between P and Q = $40t$ km

It is given that the person covered $\frac{3}{5}$ of $40t$ distance in $\frac{2t}{3}$ hours

So, he has to cover $\frac{2}{5}$ of $40t$ i.e. $16t$ in $\frac{1t}{3}$ hours

Speed = $16t \times \frac{3}{1t} = 48\text{kmph}$ [Speed = Distance/Time]

Hence, option b is correct.

