IASBABA

[IASBABA'S 60 DAYS PLAN – ENVIRONMENT COMPILATION]

Born with the vision of "Enabling a person located at the most remote destination a chance at cracking AIR 1 in IAS".

Q.1) According to a recent study, India's Sulphur dioxide (SO2) emission is among the highest in world. Which of the following are initiatives taken by government to reduce the emission of Sulphur dioxide?

1. It is one of the pollutants being measured in Air Quality Index.
2. Increasing cess on coal production to Rs 400 per tonnes.
3. Implementation of Bharat Stage Norms.
4. Including Sulphur dioxide in the hazardous gas list.

Select the correct answer using the codes given below.

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

Q.1) Solution (c)

SO2 is not listed under hazardous gas list. It is widely used in industrial productions.

Over the last 10 years, India's SO2 emissions have spiked by 50% and it could become the world's largest emitter of the toxic air pollutant

Government Action on SO2

- It's one of the pollutants being measured under Air Quality Index.
- Increasing cess on coal production to Rs 400 per tonnes.
- Implementation of Bharat Stage Norms
- **Emission norms for Thermal power plant (2015):** It directs them to reduce emission of PM 10, SO2 and oxide of nitrogen.

Do you know?

- Around 33 million Indians live in areas with substantial Sulphur dioxide pollution – a number which has doubled since 2013. This might also increase with growing demand of energy.

THINK!

- Acid rain
- Ocean acidification.

Q.2) Negative Emission Technologies refer to a number of technologies, the objective of which is the large-scale removal of carbon dioxide from the atmosphere. Consider the following technologies

1. Bio-energy with carbon capture and storage (BECCS).
2. Biochar
3. Carbon capture and storage
4. Ocean fertilization

Which of the above is/are Negative Emission Technologies?

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

Q.2) Solution (d)

Carbon Dioxide Removal (CDR) also known as **negative emission technologies** refer to a number of technologies, the objective of which is the large-scale removal of carbon dioxide from the atmosphere. Among such technologies **are bio-energy with carbon capture** and **storage, biochar, ocean fertilization, enhanced weathering, and direct air capture when combined with storage**. CDR is a different approach than removing CO_2 from the stack emissions of large fossil fuel point sources, such as power stations. The latter reduces emission to the atmosphere but cannot reduce the amount of carbon dioxide already in the atmosphere.

Bio-energy with carbon capture and storage (**BECCS**) is a future greenhouse gas mitigation technology which produces negative carbon dioxide emissions by combining bioenergy (energy from biomass) use with geologic carbon capture and storage.

Biochar is charcoal used as a soil amendment. Biochar is a stable solid, rich in carbon, and can endure in soil for thousands of years. Like most charcoal, biochar is made from biomass via pyrolysis. Biochar is under investigation as an approach to carbon sequestration.

Carbon capture and storage (**CCS**) (or **carbon capture and sequestration** or **carbon control and sequestration**) is the process of capturing waste carbon dioxide (CO_2) from large point sources, such as fossil fuel power plants, transporting it to a storage site, and depositing it where it will not enter the atmosphere, normally an underground geological formation.

Ocean fertilization or **ocean nourishment** is a type of climate engineering based on the purposeful introduction of nutrients to the upper ocean to increase marine food

production and to remove carbon dioxide from the atmosphere. A number of techniques, including fertilization by iron, urea and phosphorus have been proposed.

Do you know?

- INDC pledges submitted by countries to reduce current emissions are only about one third of what is needed to prevent catastrophic temperature increases by "at least" 3°C from preindustrial levels by the year 2100.

THINK!

- Intergovernmental panel on climate change (IPCC)
- Enhanced weathering.

Q.3) Recently the Pet Coke or Petroleum coke was in news. Consider the following statements about it.

1. Pet coke is a solid carbon rich material derived from oil refining.
2. It is cleaner alternative to coal and emits 11% less greenhouse gas.
3. India is the world's largest producer of pet coke.
4. It has the least Sulphur content among fossil fuels.

Select the *incorrect* statements using the codes given below.

a) 2 and 3 only
b) 1, 2 and 3 only
c) 2, 3 and 4 only
d) None

Q.3) Solution (c)

Petroleum coke or pet coke is a solid carbon rich (90% carbon and 3% to 6% sulfur) material derived from oil refining. It is categorized as a "bottom of the barrel" fuel. It is a dirtier alternative to coal and emits 11% more greenhouse gases than coal. **India is the world's biggest consumer of petroleum coke.** It is an approved fuel in many states such as Andhra Pradesh, Telangana, Gujarat and Karnataka.

Do you know?

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

- According to it, governments may prohibit the use of fuel, which is likely to cause air pollution, in air pollution control areas.
- Act also gives authority to state board to declare any fuel as 'approved fuel'.

THINK!

- Environment Protection (Prevention and Control) Authority (EPCA).
- Carbon tax.

Q.4) Which of the following best defines the permaculture?

a) Permaculture is a system of agriculture and aquaculture within the ecological carrying capacity of the region.
b) Permaculture is a system of agricultural and social design principles centered on simulating or directly utilizing the patterns and features observed in natural ecosystems.
c) Permaculture is a system of agriculture and agro based industry developing side by side.
d) None.

Q.4) Solution (b)

Permaculture

It is the conscious design and maintenance of agriculturally productive ecosystems which have the diversity, stability, and resilience of natural ecosystems. It is the harmonious integration of landscape and people —providing their food, energy, shelter, and other material and non-material needs in a sustainable way. The term was coined by Bill Mollison in 1978.

Do you know?

- 'IPC' or the International Permaculture Convergence is an epic gathering of permaculture practitioners from around the world, to share knowledge and expertise and strategize about the future of the permaculture movement. It has been active since 1985 and brings together inspiring and experienced permaculturists to deliver diverse and engaging programmes.

THINK!

- Integrated farming.
- Organic farming.

Q.5) Consider the following statements.

1. An aerosol is a suspension of fine solid particles or liquid droplets, in air or another gas.
2. Examples of anthropogenic aerosols are fog, dust, forest exudates and geyser steam.

3. Examples of natural aerosols are haze, particulate air pollutants and smoke.
4. Aerosol contributes to global warming.

Which of the given statements is/are correct?

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

Q.5) Solution (a)

An aerosol is a suspension of fine solid particles or liquid droplets, in air or another gas. Aerosols can be natural or anthropogenic. Examples of natural aerosols are fog, dust, forest exudates and geyser steam. Examples of anthropogenic aerosols are haze, particulate air pollutants and smoke.

- Impact cloud formations because water condenses on aerosol particles.
- Offset warming from greenhouse gases because it sends some of the sun's radiant energy back to space and exerting a cooling influence on Earth's climate.

Do you know?

- Climatologist from Indian Institute of Tropical Meteorology contended that aerosols (particulate matter) are the major cause of weakening of the monsoon.

THINK!

- Green houses impact on monsoon.
- Global dimming

Q.6) Any practice that affects the equilibrium of an aquatic environment may alter the temperature of that environment and subsequently cause thermal pollution. Consider the following statements regarding thermal pollution:

1. Thermal pollution comes in the form of dumping warm waters not cold waters into lake, river, or ocean.
2. Volcanic eruption is one source of thermal pollution.
3. Due to thermal pollution dissolved oxygen content in water increases.

Choose the correct answer using the codes given below.

a) 1 and 3 only
b) 2 only
c) 3 only
d) None.

Q.6) Solution (b)

Any practice that affects the equilibrium of an aquatic environment may alter the temperature of that environment and subsequently cause thermal pollution. It may come in the form of warm or cold water being dumped into a lake, river, or ocean.

In layman's terms, thermal pollution is when an industry or other human-made organization takes in water from a natural source and either cools it down or heats it up. They then eject that water back into the natural resource, which changes the oxygen levels and can have disastrous effects on local ecosystems and communities.

Thermal pollution is defined as sudden increase or decrease in temperature of a natural body of water which may be ocean, lake, river or pond by human influence. This normally occurs when a plant or facility takes in water from a natural resource and puts it back with an altered temperature. Usually, these facilities use it as a cooling method for their machinery or to help better produce their products.

Source of thermal pollution

- Volcanic eruption or geothermal activities below the ocean.
- Heated waste water produces from coal-based power plant,
- Textile paper and pulp industry.
- Deforestation and decreasing tree coverage and Soil erosion.

Ecological Impact of thermal Pollution

Decrease in dissolved oxygen: warmer water increases the rate of decomposition of organic matter, resulting in higher rate of decreasing the depleted oxygen. Threat to temperature sensitive organism for instance, stenothermic organism can survive in a narrow range of temperature any variation in temperature is detrimental to their survival. It disrupts the stability of food chain and alters the ecology of marine organisms.

Do you know?

- During warm weather, urban runoff can have significant thermal impacts on small streams, as storm water passes over hot parking lots, roads and sidewalks

THINK!

- Thermal Shock.

Q.7) "Methanol has been promoted as an alternative transportation fuel from time to time over the past forty years". Which of the following statements regarding Methanol is *not* correct?

a) It can be produced from natural gas.
b) It is a biodegradable fuel.

c) Similar to hydrocarbon fuels, it is not soluble in water.
d) It can be blended with ethanol and gasoline.

Q.7) Solution (c)

Methanol, like ethanol but unlike hydrocarbon fuels, is water soluble. As a consequence, it is transported through diffusion and convection through the environment at much faster rate than hydrocarbons. In addition to fast migration, methanol bio-degrades much faster than hydrocarbons. Fast transport and degradation result in short lifetimes. Hydrocarbons, on the other hand, comprise many stable compounds, which include some, such as aromatics, that are highly toxic to bio-organisms and degrade slowly.

Do you know?

- It is a liquid fuel which **can be blended with gasoline and ethanol** and can be used with today's vehicle technology at minimal incremental costs.
- It is a safe fuel. The toxicity (mortality) is comparable to or better than gasoline. It also **biodegrades quickly** (compared to petroleum fuels) in case of a spill.

THINK!

- Third generation biodiesel.

Q.8) Consider the statements with regard to Energy Conservation and Building Code (ECBC), 2017.

1. It prescribes the energy performance standards for all new and old commercial buildings of India.
2. To be considered ECBC- compliant building needs to demonstrate minimum energy savings of 25%.

Which of the above statements are correct?

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

Q.8) Solution (b)

Power, Coal, New and Renewable Energy and Mines launched the Energy Conservation Building Code 2017 (ECBC 2017)

Developed by Ministry of Power and Bureau of Energy Efficiency (BEE), ECBC 2017 prescribes the energy performance standards for new commercial buildings to be constructed across India.

- The updated version of ECBC provides current as well as futuristic advancements in building technology to further reduce building energy consumption and promote low-carbon growth.
- ECBC 2017 sets parameters for builders, designers and architects to integrate renewable energy sources in building design with the inclusion of passive design strategies.
- The code aims to optimise energy savings with the comfort levels for occupants, and prefers life-cycle cost effectiveness to achieve energy neutrality in commercial buildings.

In order for a building to be considered ECBC-compliant, it would need to demonstrate minimum energy savings of 25%. Additional improvements in energy efficiency performance would enable the new buildings to achieve higher grades like ECBC Plus or Super ECBC status leading to further energy savings of 35% and 50%, respectively.

Do You Know?

With the adoption of ECBC 2017 for new commercial building construction throughout the country, it is estimated to achieve a 50% reduction in energy use by 2030. This will translate to energy savings of about 300 Billion Units by 2030 and peak demand reduction of over 15 GW in a year. This will be equivalent to expenditure savings of Rs 35,000 crore and 250 million tonnes of CO_2 reduction.

Think

- Bureau of Energy Efficiency (BEE)
- Green Buildings

Q.9) Which of the following is commonly known as "Terror of Bengal'?

a) Norway Maple
b) Water Hyacinth
c) Common Ivy
d) Honeysuckle

Q.9) Solution (b)

Terror Of Bengal: Water Hyacinth

The beautiful mauve-colored flowers found on very appealingly-shaped floating plants in water bodies. These plants which were introduced into India for their lovely flowers have caused havoc by their excessive growth by causing blocks in our waterways. They grow faster than our ability to remove them. These are plants of water hyacinth (Eichhornia crassipes), the world's most problematic aquatic weed, also called Terror of Bengal.They grow abundantly in eutrophic water bodies, and lead to an imbalance in the ecosystem dynamics of the water body.

Fish is a supplement food in **Bengal**, and because of the fish scarcity in **Bengal** caused by Eichhornia, the water hyacinth is also called "**Terror of Bengal**".

Think

- Invasive species

Q.10) The 'Kubuqi Model' has been praised by the UN Environment Programme for desertification control and being an "eco-pioneer" in greening the world. Which of the following statements regarding Kubuqi model are correct?

1. It was developed by Private firms with the help of local people.
2. It is implemented in Egypt to promote livelihood and small industries in the region.
3. The UNEP calls it Kubuqi Ecological restoration project.

Select the code from following:

a) 1 and 2

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

Q.10) Solution (c)

Life has a chance these days in Inner Mongolia's Kubuqi Desert, around 18,600 sq km of golden sand dunes that plunge south in an arc from China's Yellow River. Centuries of grazing had denuded the land of all vegetation, and the region's 740,000 people were wallowing in isolated poverty.

In 1988, the Chinese firm Elion Resources Group partnered with local people and the Beijing government to combat desertification. Almost three decades later, one third of Kubuqi has been greened. Special plants have been grown to grip the shifting sands and to prevent the dunes encroaching on farms and villages.

The Kubuqi project illustrates how private firms can tackle environmental degradation, boost livelihoods and safeguarding the planet — all while chasing profits for themselves. The scheme won Elion the 2013 Global Dryland Champion Award — a prize given out by the U.N. Convention to Combat Desertification — in recognition of the "tremendous impact" on local people's lives.

Think

- Desertification
- Sahel region

To read more about the project follow the link

http://time.com/4851013/china-greening-kubuqi-desert-land-restoration/

Q.11) Which statements are correct regarding 'Ganga Gram' project?

1. It aims for holistic sanitation development in villages on banks of river Ganga
2. It was launched under Namami Ganga Programme
3. It is initiative of Ministry of Environment, Forest and Climate Change

Select the code from below:

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

d) All of the above

Q.11) Solution (b)

Ganga Gram Project

The Ministry of Drinking Water and Sanitation (MDWS) launched 'Ganga Gram' – a project for sanitation based integrated development of all 4470 villages along the River Ganga.

Ganga Gram vision is an integrated approach for holistic development of villages situated on the banks of River Ganga with active participation of the villagers. After achieving ODF target in Ganga Villages, implementation of solid and liquid waste management and other integrated activities are remaining tasks.

Ministry of Drinking Water and Sanitation is the nodal agency for implementation of the Ganga Gram Project.

Think

- Namami Ganga Project

http://pib.nic.in/newsite/printrelease.aspx?relid=174802

Q.12) Consider the following statement regarding Rhizofiltration:

1. Rhizofiltration refers to the approach of using hydroponically cultivated plant roots to remediate contaminated water.
2. Rhizofiltration is used for treatment in soil remediation.

Which of the above statements are correct?

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

Q.12) Solution (a)

This process is very similar to phytoextraction in that it removes contaminants by trapping them into harvestable plant biomass.

The major difference between rhizofiltration and phytoextraction is that rhizofiltration is used for treatment in aquatic environments, while phytoextraction deals with soil remediation.

Rhizofiltration is a treatment method that may be conducted in situ, with plants being grown directly in the contaminated water body.

Think

- Bioremediation
- Bio - accumulation

Q.13) Consider the following statements regarding Ozone hole

1. It is a region in the stratosphere where no ozone gas is present.
2. It is caused by CFCs and bromine only
3. Montreal protocol is related to substances that deplete ozone layer

Which of the above statements are *incorrect*?

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

Q.13) Solution (c)

The ozone hole is not technically a hole where no ozone gas is present, but is actually a region of exceptionally depleted ozone in the stratosphere over the Antarctica.

That happens at the beginning of southern hemisphere spring. Ozone hole can be formed anywhere in the stratosphere due to depletion of ozone molecules but as of today it is found only in the region above Antarctic continent which has favourable weather conditions like polar stratospheric clouds which aid the process of ozone hole formation.

In this particular region the ozone has depleted by 65% that is the reason it is called as ozone hole where as in other region it is 20%.

It is caused by CFCs, halons, carbon tetrachloride and methyl chloroform.

Montreal protocol on substances that deplete the ozone layer is the most successful international treaty till date which prohibits the production and consumption of compounds that deplete the ozone layer.

Think

- Dobson

Q.14) Which of the following statements about ocean acidification are *incorrect*?

1. Ocean acidification is the ongoing increase in the pH of the Earth's oceans, caused by the uptake of carbon dioxide from the atmosphere
2. It increases the concentration of hydrogen ions and decreases the concentration of carbonate ions.
3. Ocean acidification leads to seawater pH go below 7

Select the code from following:

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

Q.14) Solution (c)

Ocean acidification is the ongoing decrease in the pH of the Earth's oceans, caused by the uptake of carbon dioxide (CO_2) from the atmosphere. It increases the concentration of hydrogen ions and decreases the concentration of carbonate ions. Seawater is slightly basic, and the process in question is a shift towards pH-neutral conditions rather than a transition to acidic conditions ($pH < 7$).

Note: If pH will get to 7 the entire marine life will extinguish.

Think

- Coral Bleaching

Q.15) Consider the following in regard to Fly ash, a by-product of the thermal power plants:

1. They often contain pollutants such as heavy metals and organic compounds.
2. They are used to produce high quality walling material and construct eco-friendly and cost-effective houses.
3. They have potential to improve survival, growth and quality of plantation taken up in wasteland and hence transform barren wasteland into lush green forests.

Which of the statements given above is/are correct?

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

Q.15) Solution (d)

Findings of years-long experiments by scientists and forest administrators showed fly ash improved survival, growth and quality of plantation taken up in wasteland. They suggested fly ash should be used for forestry and development of degraded or wasteland — a solution to ever-increasing fly ash burden.

Fly ash is a resourceful material and can be effectively utilized as soil modifier in large quantity and micro fertilizer in converting wasteland (barren land, rocky nature, sandy and water logged soil, highly alkali and acidic soil etc.) into agriculturally productive land. Best thing about fly ash is, that it retains water in ground and helps bacterial actions to take place to cultivate good quality of crops or vegetables.

There is wide scope for use of fly ash as a nursery material for substituting soil and sand for nursery raising as well as for promotion of forestry plantation. Besides, application of fly ash would help reclamation of waste degraded forestland and enhance growth of tree species.

Chhonkar, ICAR emeritus scientist, IARI, New Delhi, has said that the use of fly ash in agriculture would play a major role in the second green revolution.

Fly ash technology has also provided relief to the overstressed resource base of soils being mined for the production of fired-bricks.

The use of fly ash in building bricks, first popularised in India by the Institute for Solid Waste Research and Ecological Balance (INSWAREB) in Vishakhapatnam, India, is now rapidly gaining acceptance in construction works. The World Bank has now entered into an agreement with INSWAREB to promote this environment friendly technology - a move that would also yield revenue through sale of carbon credits.

Blending fly ash with concrete can produce a more durable structure, resistant to corrosion as well as water.

In summary, the use of fly ash bock technology has shown a way to reduce the consumption of energy and the use of scarce agricultural soil required for the production of traditional fired bricks and at the same time provides a solution to the environmental hazard of dumping ash as has been the practice of most power plants in India.

Fly ash often contains pollutants such as heavy metals and organic compounds. Its inhalation has been linked to silicosis and results in TB, asthama and weakening of the lungs. The massive generation of this ash by thermal power plants has become a major cause of concern for people living in cities and towns in the country. It can pollute air and water and may cause heavy metal pollution in water bodies.

Do you know?

Recently, the National Green Tribunal has directed all States and Union Territories to submit an action plan on the usage of fly ash that is generated from thermal power plants.

THINK!

- Contaminants of Fly Ash
- Major oxides present in Fly Ash

Q.16) Identify the incorrect statement about Bomb cyclone or bombogenesis, which was in news recently:

a) It is a rapidly deepening tropical cyclonic low-pressure area, predominantly found in continental settings.
b) It is a storm caused by a collision of warm air and cold air which develop into rotating storm-like pattern and lead to an explosive deepening of pressure.
c) A storm is considered a 'bomb' when the pressure drops rapidly — at least 24 millibars in 24 hours.
d) None of the above.

Q.16) Solution (a)

Explosive cyclogenesis or **bomb cyclone** or **bombogenesis** refers in a strict sense to a rapidly deepening extra-tropical cyclonic low-pressure area. To enter this category, the central pressure of a depression at 60° latitude is required to decrease by 24 mbar (hPa) or more in 24 hours.

What makes a storm a "bomb" is how fast the atmospheric pressure falls; falling atmospheric pressure is a characteristic of all storms. By definition, the barometric pressure must drop by at least 24 millibars in 24 hours for a storm to be called a bomb cyclone; the formation of such a storm is called bombogenesis.

This is a predominantly maritime, winter event, but also occurs in continental settings. In other words, bomb cyclones are mostly found over open oceans and are rarely seen over

land. Hence, statement (1) is wrong and also because it is wrongly mentioned as tropical cyclonic low-pressure area.

Do you know?

The United States East Coast and Midwest were battling record-breaking low temperatures during January 2018 as cold Arctic air continued to sweep through the region followed by the freezing winter storm — bomb cyclone or bombogenesis.

This cyclone is essentially a storm caused by a collision of warm air and cold air which develop into rotating storm-like pattern and lead to an explosive deepening of pressure.

Article link: http://indianexpress.com/article/what-is/what-is-bomb-cyclone-and-why-is-it-freezing-usa-5014731/

Q.17) Consider the below statements with respect to World Sustainable Development Summit (WSDS):

1. The 2018 WSDS was organized by The Energy and Resources Institute.
2. It is annual flagship event of UN.
3. The theme of the 2018 Summit is 'Partnerships for a Resilient Planet'.

Which of the statements given above is/are correct?

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

Q.17) Solution (c)

The 2018 edition of **World Sustainable Development Summit** (WSDS 2018) was held at Vigyan Bhawan in New Delhi. It was inaugurated by Prime Minister Narendra Modi.

WSDS is flagship forum of The Energy and Resources Institute (TERI). It seeks to bring together global leaders and thinkers in the fields of sustainable development, energy and environment sectors on common platform.

The WSDS series seeks to bring together the finest minds and leading thinkers of the world to focus attention on the challenge of sustainable development and has emerged as a landmark event addressing issues pertinent to the future of humanity.

An exhibition, named as **'Greenovation Exhibition'** will be exhibiting the latest technological advancements to meet Sustainable Development Goals.

The theme of the 2018 Summit is 'Partnerships for a Resilient Planet'.

Do You Know?

- WSDS has replaced TERI's earlier called Delhi Sustainable Development Summit (DSDS)
- TERI was ranked second among world's best climate think tank by the International Centre for Climate Governance (ICCG).

Q.18) Which among the following statements is/are true about Talanoa Dialogue?

1. It is an important international conversation in which countries will check progress and seek to increase global ambition to meet the goals of the Paris Climate Change Agreement.
2. The Dialogue was launched at the UN Climate Change Conference COP23 in Bonn.

Choose the correct answer:

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

Q.18) Solution (c)

With the official launch of the **2018 Talanoa Dialogue** in January, countries are now embarking on the first global assessment of collective efforts to achieve the Paris goals.

It is an important international conversation in which countries will check progress and seek to increase global ambition to meet the goals of the Paris Climate Change Agreement.

Do you know?

The Dialogue was launched at the UN Climate Change Conference **COP23 in Bonn** in November 2017 and will run throughout 2018. The Paris Agreement's central goal is keep the global average temperature rise to below 2C degrees and as close as possible to 1.5C.

Q.19) Identify the incorrect pair from the below:

(Financial Mechanism) : : (Associated Convention)

a) Green Climate Fund (GCF) : : COP 16 held in Cancun
b) Global Environment Facility (GEF) Fund : : eve of the 1992 Rio Earth Summit
c) Special Climate Change Fund (SCCF) : : Kyoto Protocol in 2001
d) Adaptation Fund (AF) : : Paris Convention 2015

Q.19) Solution (d)

Adaptation Fund (AF) was established in 2001 to finance concrete adaptation projects and programmes in developing country Parties to the Kyoto Protocol that are particularly vulnerable to the adverse effects of climate change.

The Adaptation Fund is financed with a share of proceeds from the clean development mechanism (CDM) project activities and other sources of funding. The share of proceeds amounts to 2 per cent of certified emission reductions (CERs) issued for a CDM project activity.

The Adaptation Fund is supervised and managed by the Adaptation Fund Board (AFB). The AFB is composed of 16 members and 16 alternates and meets at least twice a year (Membership of the AFB).

Do you know?

National Adaptation Fund for Climate Change (NAFCC) – a Central Sector Scheme 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 projects related to adaptation in sectors such as agriculture, animal husbandry, water, forestry, tourism etc. are eligible for funding under NAFCC.

National Bank for Agriculture and Rural Development (NABARD) is the National Implementing Entity (NIE).

THINK!

- What is the financial mechanism for UNFCCC? What are the other funds?
- Know about different Funds. (http://bigpicture.unfccc.int/content/climate-finance/what-is-the-financial-mechanism-what-are-the-other-funds.html)

Q.20) Consider the following statements and select the correct one:

a) Decreasing levels of ozone in the stratosphere will lead to reduction in the levels of smog in major cities.
b) Decreasing levels of ozone in the stratosphere will lead to increase in the occurrence of skin cancer in humans.
c) Decreasing levels of ozone in the stratosphere will lead to reduction in rate of global warming.
d) Decreasing levels of ozone in the stratosphere will lead to increase in photosynthetic activity of phytoplankton.

Q.20) Solution (b)

Ground-level ozone is involved with smog formation, not ozone in the stratosphere.

While tropospheric ozone is considered a greenhouse gas, stratospheric ozone is not thought to have a significant effect on global warming.

Decreasing levels of stratospheric ozone result in increased levels of ultraviolet radiation reaching the ocean, which may inhibit phytoplankton photosynthetic activity in surface waters.

The increased levels of ultraviolet radiation can also negatively affect human health.

THINK!

- What are the difference between ozone in the stratosphere and ground-level ozone?
- Why ground-level ozone are formed or why ozone is stratosphere is decreasing?
- Ozone related conventions and protocols.

Q.21) Global Environment Facility provides grants for projects related to:

1. Climate change
2. Ozone layer
3. International waters
4. Land degradation
5. Persistent Organic Pollutants

Choose correct answer from the code given below:

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

d) 1, 2, 3, 4 and 5

Q.21) Solution (d)

GEF provides grants for projects related to biodiversity, climate change, international waters, land degradation, the ozone layer, and persistent organic pollutants.

The Global Environment Facility (GEF) unites 183 countries in partnership with international institutions, civil society organizations (CSOs), and the private sector to address global environmental issues while supporting national sustainable development initiatives. Today the GEF is the largest public funder of projects to improve the global environment.

The GEF also serves as financial mechanism for the following conventions:

- Convention on Biological Diversity (CBD)
- United Nations Framework Convention on Climate Change (UNFCCC)
- UN Convention to Combat Desertification (UNCCD)
- Stockholm Convention on Persistent Organic Pollutants (POPs)
- Minamata Convention on Mercury

Q.22) Which of the following are the goods and services provided by ecosystems?

1. Provision of food, fuel and fiber
2. Purification of air and water
3. Pollination of plants, including many crops Control of pests and diseases
4. Cultural and aesthetic benefits

Select the correct answer using the codes given below.

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

Q.22) Solution (d)

Goods and Services provided by ecosystems include:

- Provision of food, fuel and fiber.
- Provision of shelter and building materials.
- Purification of air and water.
- Detoxification and decomposition of wastes.

- Stabilization and moderation of the Earth's climate.
- Moderation of floods, droughts, temperature extremes and the forces of wind.
- Generation and renewal of soil fertility, including nutrient cycling.
- Pollination of plants, including many crops Control of pests and disease.
- Maintenance of genetic resources as key inputs to crop varieties and livestock breeds, medicines, and other products.
- Cultural and aesthetic benefits.

Do you know?

- The concept of **ecological debt** was coined by southern NGOs at the beginning of the 1990s. It usually refers to the ecological damage caused by industrialized countries to the southern hemisphere and/or to the use of ecosystem services at the expense of southern-hemisphere countries. Currently, several NGO networks from north and south are campaigning for the recognition of the concept.

THINK!

- Environmentalism

Q.23) Which of the following of a species best describes, how an organism or population responds to the distribution of resources and competitors, and how it in turn alters those same factors for its survival?

a) Ecotone
b) Ecology
c) Ecological niche
d) Edge effect

Q.23) Solution (c)

An **ecological niche** describes how an organism or population responds to the distribution of resources and competitors (for example, by growing when resources are abundant, and when predators, parasites and pathogens are scarce) and how it in turn alters those same factors (for example, limiting access to resources by other organisms, acting as a food source for predators and a consumer of prey).

Do you know?

- Niche plays an important role in conservation of organisms. If we have to conserve species in its native habitat we should have knowledge about the niche

requirements of the species and should ensure that all requirements of its niche are fulfilled.

THINK!

- Ecocline

Q.24) Consider the following statements about the biosphere.

1. The energy required for the life within the biosphere comes from the air, water and soil.
2. The nutrients necessary for living organisms come from the sun.
3. Living organisms are uniformly distributed throughout the biosphere.

Select the correct answer using the codes given below.

a) 1 and 3 only
b) 1 only
c) 2 and 3 only
d) None

Q.24) Solution (d)

The energy required for the life within the biosphere **comes from the sun**. The nutrients necessary for living organisms come **from air, water and soil**. The same chemicals are recycled over and over again for life to continue.

Living organisms are **not uniformly distributed throughout the biosphere**. Only a few organisms live in the polar regions, while the tropical rain forests have an exceedingly rich diversity of plants and animals.

Do you know?

- The climate determines the boundaries of a biome and abundance of plants and animals found in each one of them. The most important climatic factors are **temperature and precipitation.**

THINK!

- Aquatic zones.

Q.25) Consider the following statements about the energy flow among different trophic levels.

1. The flow of energy from producer to top consumers is called energy flow which is bidirectional.
2. The pyramid of energy is always upward, with a large energy base at the bottom.
3. Biomass pyramid concept helps to explain the phenomenon of biological magnification.

Which of the above statements is/are correct?

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

Q.25) Solution (c)

Energy is the basic force responsible for all metabolic activities. The flow of energy from producer to top consumers is called **energy flow which is unidirectional**.

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 pf energy being depicted at each transfer to another trophic level. Hence the pyramid is always upward, with a large energy base at the bottom.

Energy pyramid concept helps to explain the phenomenon of **biological magnification** the tendency for toxic substances to increase in concentration progressively at higher levels of the food chain

Do you know?

- In **bioaccumulation** there is an increase in concentration of a pollutant from the environment to the first organism in a food chain.

THINK!

- Biomagnification.

Q.26) Biomagnification refers to the tendency of pollutants to concentrate as they move from one trophic level to the next. Consider the following statements.

1. In biomagnification there is an increase in concentration of a pollutant from one link in a food chain to another.
2. In order for biomagnification to occur, the pollutant must be long-lived, mobile, soluble in water and biologically inactive.

Which of the above statements is/are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) None

Q.26) Solution (a)

Biomagnification refers to the tendency of pollutants to concentrate as they move from one trophic level to the next. Thus, in biomagnification there is an increase in concentration of a pollutant from one link in a food chain to another.

In order for biomagnification to occur, the pollutant must be**: long-lived, mobile, soluble in fats, biologically active. ·**

If a pollutant is short-lived, it will be broken, down before it can become dangerous. If it is not mobile, it will stay in one place and is unlikely to be taken up by organisms. If the pollutant is soluble in water, it will be excreted by the organism. Pollutants that dissolve in fats, however, may be retained for a long time.

Do you know?

- If a pollutant is not active biologically, it may biomagnify, but we really don't worry about it much, since it probably won't cause any problems Examples: DDT.

THINK!

- Bio geo chemical cycle.

Q.27) Consider the following pair of biotic interactions.

Type of interaction	Result
1. Mutualism	There is no net benefit or harm to either species
2. Amensalism	One species is harmed, the other is unaffected
3. Neutralism	Both species benefit.

Which of the above pairs is/are correct?

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

Q.27) Solution (c)

Mutualism: both species benefit.

Example: in pollination mutualisms, 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 than they would if alone. They both suffer a shortage of food

Predation and parasitism: one species benefits, the other is harmed.

Example: predation-one fish kills and eats 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.

Do you know?

- **Succession** is characterized by the following: increased productivity, the shift of nutrients from' the reservoirs, increased diversity of organisms with increased niche development, and gradual increase in the complexity of food webs.

THINK!

- Autogenic and Allogenic succession.

Q.28) Consider the following regarding types of corals:

1. Fringing reefs: reefs that grow close to the shore and extend out into the sea like a submerged platform.
2. Barrier reef: reefs separated from the land by wide expanses of water and follow the coastline.
3. Atolls: a roughly circular ring of reefs surrounding a lagoon, a low lying island, common in the Indian and South pacific oceans.

Which of the above is/are correct?

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

Q.28) Solution (d)

Coral reefs are shallow water, tropical marine ecosystems which are characterized by a remarkably high biomass production and a rich faunal and floral diversity perhaps unequaled by any other habitat. Corals require certain conditions to occur and can flourish only in relatively shallow waters, exposed to direct sunlight, with optimum temperature of 23-25°c and free from suspended sediments.

The structure of a reef is formed by the calcareous skeleton that houses corals, a type of soft-bodied, radially symmetrical, marine invertebrates of the phylum coelenterate. Individuals of a colony are called polyps or hydroids. Millions of coral skeletons cemented together over a period ranging from a few thousand to millions of years give rise to such reefs. Reefs can vary enormously in structure and complexity and are roughly divided into three major types.

1. Fringing reefs', reefs that grow close to the shore and extend out into the sea like a submerged platform.

2. Barrier reef: reefs separated from the land by wide expanses of water and follow the coastline.

3. Atolls: a roughly circular ring of reefs surrounding a lagoon, a low lying island, common in the Indian and South pacific oceans.

Do you know?

- The absence of reef in the Bay of Bengal is attributed to the immense quantity of freshwater and silt brought by the rivers. Other disincentives to reef growth are the heavy monsoonal rains and the high human presence on the coastline.
- The mainland coast of India has two widely separated area's containing reefs: The Gulf of Kutch in the North West, which has some of the most northerly reefs in the world and Palk Bay and the Gulf of Mannar (with numerous fringing reefs around small islands) in the south east.
- There are patches of reef in the inter-tidal areas of the central west coast of the country. Coral patches have been recorded in the intertidal regions of Ratnagiri, Malvan and Redi, south of Bombay and at the Gaveshani Bank, 100 Km west of Mangalore

- Important off shore island groups of India with extensive reef growth include the Andaman and Nicobar Islands in the Bay of Bengal and the Lakshadweep group of Islands in the Arabian sea. The Andaman and Nicobar islands have fringing reefs and a 320 km long barrier reef on the west coast. The Lakshadweep Islands are made up of atolls.

Q.29) Nayachar Island is a recently emerged riverine island. With 151 species it has become a rare case of ecology. In which of the following rivers does it occur?

a) Ganga
b) Hoogly
c) Narmada
d) Tungabhadra

Q.29) Solution (b)

Nayachar Island

- It is an emerged island in the middle estuary of the Hooghly River.
- It was created in the Indian Sundarbans (mangrove ecosystem) by river silt deposits.

News:

- Publication/Study by Zoological Survey of India (ZSI) has listed 151 animal species on the island, making it a rare case in ecology.
- The study is aimed at understanding soil stabilisation in an emerging island [and] the succession of living organisms in a new habitat.
- The natural succession of species on the island has been aided by the inundation of water during tides, and the soil brought from other places by fishermen
- A total of 27 species of fish and 37 species of birds have been recorded.
- The 104 islands of the Indian Sunderbans, both habited and uninhabited, are distributed in West Bengal's South 24 Parganas and North 24 Parganas districts.

THINK!

- Bhagirathi-Hooghly river system
- Farraka Barrage

Q.30) Consider the following statements regarding Bioindicators:

1. A bioindicator is a living organism that gives us an idea of the health of an ecosystem.
2. Only microorganisms act as bioindicators.

Which of the above statements are correct?

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

Q.30) Solution (a)

Bioindicators

What is Bioindicator?

A bioindicator is a living organism that gives us an idea of the health of an ecosystem. Some organisms are very sensitive to pollution in their environment, so if pollutants are present, the organism may change its morphology-physiology or behaviour, or it could even die.

The information can be deduced through the study of:

1. their content of certain elements or compounds
2. their morphological or cellular structure
3. metabolic biochemical processes
4. behaviour
5. population structure(s)

Bioindicators can be plants, animals or microorganisms

- There are several types of plant and fungi biomonitors, including mosses, lichens, tree bark, bark pockets, tree rings, leaves, and fungi.
- Amphibians, particularly anurans which consist of frogs and toads, are increasingly used as bioindicators of contaminant accumulation in pollution studies.

THINK!

- Biosignature
- Ecological Indicator

Q.31) Bay of Bengal hosts a 'dead zone' of around 60,000 square kilometer. Which of the following statements correctly defines a dead zone?

a) It is a region which is almost devoid of dissolved oxygen.
b) It is a region where population of fish has become almost nil because of over fishing.
c) It is a region where the population of predator exceeds the prey.
d) It is a zone of dying coral reefs.

Q.31) Solution (a)

'Dead Zone'

The Bay of Bengal (BoB) hosts a 'dead zone' of around 60,000 square kilometers almost devoid of oxygen, a new multi-national study has shown.

- Less oxygen dissolved in the water is often referred to as a "dead zone" because most marine life either dies, or, if they are mobile such as fish, leave the area.
- There are many physical, chemical, and biological factors that combine to create dead zones, but nutrient pollution is the primary cause of those zones created by humans.
- Excess nutrients that run off land or are piped as wastewater into rivers and coasts can stimulate an overgrowth of algae, which then sinks and decomposes in the water.
- The decomposition process consumes oxygen and depletes the supply available to healthy marine life.
- Dead zones occur in many areas of the country, particularly along the East Coast, the Gulf of Mexico, and the Great Lakes, but there is no part of the country or the world that is immune. The second largest dead zone in the world is located in the U.S., in the northern Gulf of Mexico.
- Until now, there have been only three major identified dead zones – two in the eastern tropical Pacific (off Peru/Chile and Mexico) and one in the Arabian Sea. Bay of Bengal is the new in the list.

Q.32) The movement of vessels around the world requires the intake of ballast water to give them a safe degree of stability when light. The release of ballast water at the port is considered to be a big ecological hazard because:

a) It increases the temperature of the coast by several degrees.
b) It causes heavy metal poisoning.
c) It is responsible for transporting alien species in new ecosystems.
d) It reduces the dissolved oxygen in the ocean water.

Q.32) Solution (c)

Ecological impacts of Ballast water discharged in ports

- On return to ports the vessels discharge the ballast water in the coastal waters, thus releasing many exotic species of flora and fauna in the ecosystem
- Ballast water are transporting more than 10000 exotic marine species across the globe
- In India ,the experts have found more than 10 invasive exotic species in the coastal waters of Kerala which are very rich in bio diversity
- The increase in number of ports and expansion of port activities has aggravated the situation recently.
- Can cause tremendous damage to our coastal ecosystems and lead to severe loss of biodiversity

Q.33) The government has constituted a committee to investigate into illegal cultivation of HT cotton in four states. The HT of HT cotton stands for

a) Hybrid transform
b) Herbal treatment
c) Herbicide tolerant
d) High Tech

Q.33) Solution (c)

HT cotton stands for Herbicide tolerant.

The government has constituted a committee to investigate into illegal cultivation of HT cotton in four states.

The cultivation of BG-III or HT cotton has not been approved by Genetic Engineering Approval Committee (GEAC) of the Ministry of Environment.

There are several media reports and complaints regarding the illegal or unauthorised cultivation of HT cotton in Andhra Pradesh, Telangana, Gujarat and Maharashtra.

Q.34) Which of the following statements are correct regarding 'Blue Flag' certification?

1. It is given to cities which have taken stringent measures to curb air pollution.
2. It is a certification given by Foundation for Environmental Education (FEE).

Select the code from following:

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

Q.34) Solution (b)

Blue Flag Certification

Ministry of Environment and Forests launched a pilot project for beach cleanup and development, also striving for the "Blue Flag" Certification for such identified beaches

- **Objective** - Enhancing standards of cleanliness, upkeep and basic amenities at beaches
- Each of the coastal State/UT was requested to identify/nominate a beach, to be funded through the ongoing Integrated Coastal Management Programme.

Blue Flag

- The Blue Flag is a certification by the Foundation for Environmental Education (FEE) that a beach, marina or sustainable boating tourism operator meets its stringent standards.
- FEE's Blue Flag criteria include standards for water quality, safety, environmental education and information, the provision of services and general environmental management criteria.
- The Blue Flag is sought for beaches, marinas and sustainable boating tourism operators as an indication of their high environmental and quality standards.

THINK!

- Integrated Coastal Zone Management Project (ICZMP)

Q.35) A new species of night frog Nyctibatrachus Mewasinghi has been discovered. Where is it found?

a) Sunderbans
b) Western Ghats
c) Nicobar Islands

d) Meghalayan Plateau

Q.35) Solution (b)

Mewa Singh's Night frog

- Nyctibatrachus mewasinghi is a new species of night frog from Western Ghats.
- Scientists have just discovered the Mewa Singh's Night frog, belonging to a genus endemic to the Western Ghats, from Kozhikode's Malabar Wildlife Sanctuary.
- Frogs in the genus Nyctibatrachus, commonly known as night frogs, are found only in the Western Ghats mountain range.
- The frog's genetically closest relatives are the Athirappilly night frog (found south of the Palakkad Gap in Thrissur and Idukki) and the Kempholey night frog (found in the northern Western Ghats of Kerala and Karnataka).

Q.36) Photochemical smog is a mixture of pollutants that are formed when nitrogen oxides and volatile organic compounds (VOCs) react to sunlight. Consider the following about VOCs:

1. VOCs are produced from the evaporation of naturally-occurring compounds such as terpenes or eucalypts.
2. VOCs are formed from the incomplete combustion of fossil fuels, from the evaporation of solvents and fuels, and from burning plant matter.

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.36) Solution (c)

Photochemical smog is a mixture of pollutants that are formed when nitrogen oxides and volatile organic compounds (VOCs) react to sunlight, creating a brown haze above cities. It tends to occur more often in summer, because that is when we have the most sunlight.

While nitrogen oxides and VOCs are produced biogenically (in nature), there are also major anthropogenic (man-made) emissions of both. Natural emissions tend to be spread over

large areas, reducing their effects, but man-made emissions tend to be concentrated close to their source, such as a city.

Biogenic sources

In nature, bushfires, lightning and the microbial processes that occur in soil generate nitrogen oxides. VOCs are produced from the evaporation of naturally-occurring compounds, such as terpenes, which are the hydrocarbons in oils that make them burn. Eucalypts have also been found to release significant amounts of these compounds.

Anthropogenic sources

Nitrogen oxides are produced mainly from the combustion of fossil fuels, particularly in power stations and motor vehicles. VOCs are formed from the incomplete combustion of fossil fuels, from the evaporation of solvents and fuels, and from burning plant matter—such as backyard burning and wood-burning stoves.

THINK!

- Formation of Smog and Photochemical smog and their differences.

Q.37) Consider the following pairs with regard to aquatic ecosystem and identify the correct pair/s from the code given below:

Aquatic Organism : : Description

1. Benthos : : organisms that are found living in the bottom of the water mass
2. Nektons : : organisms which remain attached to stems and leaves of rooted plants and substances emerging above the bottom mud
3. Neustons : : groups which contains animals/organisms which are swimmers

Code:

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

Q.37) Solution (a)

Neustons are unattached organisms which live at the air-water interface such as floating plants.

Periphytons are organisms which remain attached to stems and leaves of rooted plants and substances emerging above the bottom mud such as sessile algae and their associated group of animals.

Planktons includes both microscopic plants like algae (phytoplanktons) and animals like crustaceans and protozoans (zooplanktons) found in all aquatic ecosystems, except certain swift moving waters.

Nektons are groups which contains animals which are swimmers.

Benthos or benthic organisms are those found living in the bottom of the water mass.

Q.38) Which of the following statement is/are true with regard to Wetlands?

1. Sediments deposited by the rivers and river floodplains helps in the formation of wetlands.
2. Wetlands are found from the tundra to the tropics and on every continent.
3. Lakes are generally less important when compared to wetland from the viewpoint of ecosystem and biodiversity conservation.

Choose appropriate answer:

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

Q.38) Solution (b)

Wetlands are areas where water covers the soil, or is present either at or near the surface of the soil all year or for varying periods of time during the year, including during the growing season. Water saturation (hydrology) largely determines how the soil develops and the types of plant and animal communities living in and on the soil. Wetlands may support both aquatic and terrestrial species. The prolonged presence of water creates conditions that favor the growth of specially adapted plants (hydrophytes) and promote the development of characteristic wetland (hydric) soils.

Wetlands vary widely because of regional and local differences in soils, topography, climate, hydrology, water chemistry, vegetation and other factors, including human disturbance. Indeed, **wetlands are found from the tundra to the tropics and on every continent except Antarctica**.

Why wetlands are not found in Antarctica?

Only 0.4% of Antarctica is ice-free. Some of that has soil of a sort, but it's usually either dry or frozen. In some locations, however, there are very short-lived patches of wet soil, for example Schirmacher Oasis and Larsemann Hills.

However, these areas don't technically fit the definition of wetland because they lack the signature soils and vegetation of wetlands. The soil is too cold to develop hydric characteristics and the only vegetation is mosses, accompanied in photosynthesis by algae and cyanobacteria.

THINK!

- Characteristics of Wetlands
- Criteria for identification of Wetlands

Q.39) Which of the following are the physical processes responsible for the formation of Estuaries?

1. Rising sea level
2. Movement of sand and sandbars
3. Glacial processes
4. Tectonic processes

Select the appropriate code:

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

Q.39) Solution (d)

Estuaries and their surrounding wetlands are bodies of water usually found where rivers meet the sea. Estuaries are home to unique plant and animal communities that have adapted to brackish water—a mixture of fresh water draining from the land and salty seawater.

Most estuaries can be grouped into four geomorphic categories based on the physical processes responsible for their formation:

1. Rising sea level
2. Movement of sand and sandbars

3. Glacial processes
4. Tectonic processes

THINK!

- Indian Estuarine Ecosystem

Q.40) Consider the below statements in regard to plants found in Desert ecosystem:

1. Root system is not developed well and spread over small area to retain water.
2. Leaves are absent or reduced in size.
3. In some plants even the stem contains chlorophyll for photosynthesis.

Which of the statements given above is/are correct?

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

Q.40) Solution (c)

Deserts are formed in regions with less than 25 cm of annual rainfall, or sometimes in hot regions where there is more rainfall, but unevenly distributed in the annual cycle.

Plants in desert ecosystem adapt and conserve water by following methods:

- They are mostly shrubs.
- Leaves are absent or reduced in size.
- Leaves and stem are succulent and water storing.
- In some plants even the stem contains chlorophyll for photosynthesis.
- Root system is well developed and spread over large area.
- The annuals wherever present germinate, bloom and reproduce only during the short rainy season, and not in summer and winter.

THINK!

- Issues related to land degradation and desertification and how to address those issues.

Q.41) Consider the below statements and select the correct statement from the codes given below:

1. When succession is brought about by living inhabitants of that community itself, the process is called Autotrophic succession
2. When succession is brought about by outside forces is known as Allogenic succession.

Choose the correct answer:

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

Q.41) Solution (b)

Ecological succession is the process of change in the species structure of an ecological community over time. The time scale can be decades (for example, after a wildfire), or even millions of years after a mass extinction.

Autogenic and Allogenic Succession

- When succession is brought about by living inhabitants of that community itself, the process is called autogenic succession, while change brought about by outside forces is known as allogenic succession.

Autotrophic and Heterotrophic succession

- Succession in which, initially the green plants are much greater in quantity is known as autotrophic succession; and the ones in which the heterotrophs are greater in quantity is known as heterotrophic succession.

Q.42) Western Ghats has very rich biodiversity as compared to Eastern Ghats, because -

1. Western ghats are continuous mountains.
2. Western Ghats is area of high orographic precipitation.
3. Many major rivers have its source at Western Ghats.

Select the correct answer using the codes given below:

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

Q.42) Solution (d)

Western Ghats are continuous mountains from south Kerala to Maharashtra. Its average height is also very high at more than 1000m. But Eastern Ghats is not that much continuous being split by many major rivers. Its average height is around 600m.

Usually more biodiversity is found in tropical rainforests which receives very heavy annual rainfall. During southwest monsoon Western Ghats acts as a barrier for the moisture winds from Arabian Sea causing very heavy rainfall. Hence Western Ghats is full of rainforests.

But Eastern Ghats is parallel to the north east monsoon winds. So rainfall is low compared to Western Ghats.

Southwest monsoon rainfall acts as source for many major rivers which makes it very fertile forming rainforests. These rainforests in Western Ghats acts as a home for more flora and fauna. This is the reason for more biodiversity in Western Ghats

Q.43) Consider the following pairs.

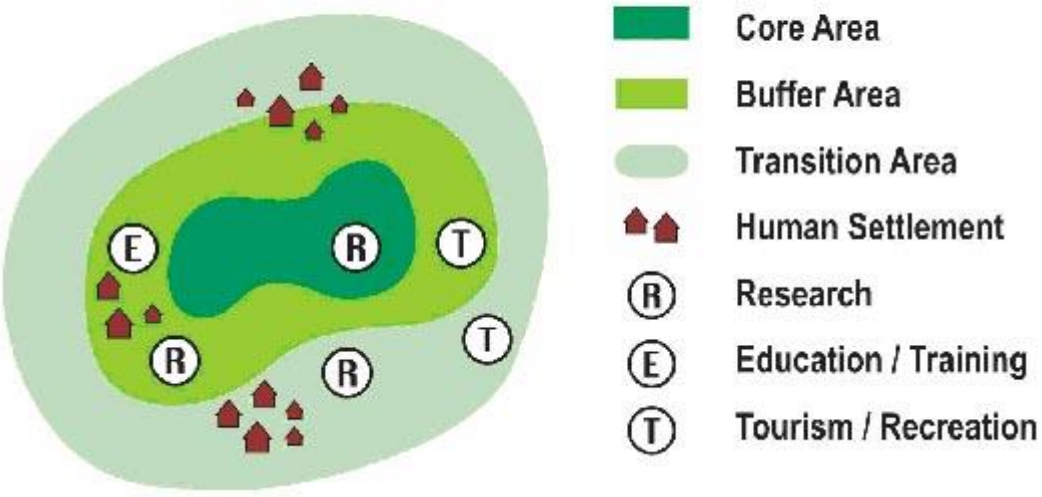
Zone	Activities
1. Core	The core zone is to be kept-free from all human pressures external to the system.
2. Transition	uses and activities include restoration, demonstration sites for enhancing value addition to the resources, limited recreation, tourism, fishing and grazing.
3. Buffer	zone of cooperation where conservation, knowledge and management skills are applied

Which of the above pairs is/are correctly matched?

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

Q.43) Solution (a)

Structure of a model biosphere reserve.



The core zone is kept absolutely undisturbed. It must contain suitable habitat for numerous plant and animal species, including higher order predators and may contain centres of endemism. Core areas often conserve the wild relatives of economic species and also represent important genetic reservoirs. The core zones also contain places of exceptional scientific interest. A core zone secures legal protection and management and research activities that do not affect natural processes and wildlife are allowed. Strict nature reserves and wilderness portions of the area are designated as core areas of BR. **The core zone is to be kept free from all human pressures external to the system.**

In the Buffer Zone, which adjoins or surrounds core zone, uses and activities are managed in ways that protect the core zone. **These uses and activities include restoration, demonstration sites for enhancing value addition to the resources, limited recreation, tourism, fishing and grazing, which are permitted to reduce its effect on core zone.** Research and educational activities are to be encouraged. Human activities, if natural within BR, are likely to be permitted to continue if these do not adversely affect the ecological diversity.

The Transition Zone is the outermost part of a Biosphere Reserve**. This is usually not delimited one and is a zone of cooperation where conservation, knowledge and management skills are applied and uses are managed in harmony with the purpose of the Biosphere Reserve.** This includes settlements, crop lands, managed forests and area for intensive recreation, and other economic uses characteristic of the region.

Do you know?

- Biosphere Reserves in India, categories roughly corresponding to IUCN Category V Protected areas.

THINK!

- World Network of Biosphere Reserve.

Q.44) Consider the following statement about Red Data Book.

1. Increase in the number of red pages indicates increase in number of critically endangered species.
2. Increase in number of green page indicates the increase in conservation efforts.

Which of the above statements is/are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) None

Q.44) Solution (b)

The Red Data Book, information for endangered mammals and birds are more extensive than for other groups of animals and plants, coverage is also given to less prominent organisms facing extinction.

The pink pages in this publication include the critically endangered species. With passing time, the number of pink pages continues to increase which indicates increasing number of critically endangered species.

Green pages are used for those species that were formerly endangered but have now recovered to a point where they are no longer threatened. So, increase in green pages indicates the increase in conservation efforts.

Do you know?

- A taxon **is Extinct in the Wild** when it is known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range. A taxon is presumed Extinct in the wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual.

THINK!

- Critically Endangered(CR)
- Endangered(EN)
- Vulnerable(VU)

Q.45) Which of the following are examples of in-situ conservation?

1. National Parks
2. Sanctuaries
3. Biosphere reserves
4. Recreational gardens

Select the correct answer using the codes given below.

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

Q.45) Solution (a)

In-situ 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
- Protected forests
- Nature reserves

Ex-situ conservation: Conserving biodiversity outside the areas where they naturally occur is known as ex-situ conservation.

Seed banks, botanical, horticultural and **recreational gardens** are important centers for ex-situ conservation.

Do you know?

- Biodiversity is measured by two major components **species richness, and species evenness.**

THINK!

- Levels of Biodiversity.

Q.46) Which of the following are the Biodiversity Conservation initiatives in India?

1. Schedule list of Wild Life Protection Act 1972
2. Captive Breeding
3. Project Tiger
4. Sea Turtle Project

Select the correct answer using the codes given below.

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

Q.46) Solution (d)

WPA 1972 consists of 6 schedule lists, which give varying degrees of protection.

Poaching, smuggling and illegal trade of **animals listed Schedule 1 to schedule 4** are prohibited. **Animals listed in schedule 1 and part II of schedule 2 have absolute protection** – offences under these are prescribed the highest penalties. Examples of animals listed in schedule 1 are lion tailed macaque, rhinoceros, great Indian bustard, narcondam hornbill, nicobar megapode, black buck, etc. Examples of animals listed in schedule 2 are rhesus macaque, dhole, Bengal porcupine, king cobra, flying squirrel, Himalayan brown bear, etc.

Captive breeding means that members of a wild species are captured, then bred and raised in a special facility under the care of wildlife biologists and other expert.

Bringing an animal into captivity may represent the last chance to preserve a species in the wild in these situations.

When a population drops dangerously, captive breeding can boost numbers. Captive-produced young can sometimes be released into the wild where populations have diminished or disappeared, yet where suitable habitat remain to support them.

Project Tiger centrally sponsored scheme was launched in 1973 with the following objectives.

To ensure maintenance of available population of Tigers in India for scientific, economic, aesthetic, cultural and ecological value.

To preserve, for all times, the areas of such biological importance as a national heritage for the benefit, education and enjoyment of the people.

With the objective of conservation of olive ridley turtles and other endangered marine turtles, Ministry of Environment & Forests initiated the **Sea Turtle Conservation Project** in collaboration of UNDP in November 1999 with Wildlife Institute of India, Dehradun as the Implementing Agency.

The project is being implemented in 10 coastal States of the country **with special emphasis in State of Orissa.**

Do you know?

- Animals listed in schedule 5 are called "vermin" which can be hunted. Mice, rat, common crow and flying fox (fruit eating bats are the list of animals (only 4 nos) in schedule 5 [i.e. vermin].

THINK!

- Vulture Safety Zones.

Q.47) Consider the following statements about Aichi Target.

1. The 'Aichi Target' is adopted by the United Nations Framework Convention on Climate Change at its Nagoya conference.
2. They are a series of goals that were set for protection and conservation of biodiversity.

Which of the above statements is/are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) None

Q.47) Solution (b)

Aichi Target

The 'Aichi Target' adopted by the Convention on Biological Diversity (CBD) at its Nagoya conference. In the COP-10 meeting, the parties agreed that previous biodiversity protection targets are not achieved, so we need to do come up with new plans and targets

The short-term plan provides a set of 20 ambitious yet achievable targets, collectively known as the Aichi Targets.

Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society.

Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use.

Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity.

Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services.

Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building.

Do you know?

- **Target 11:** By 2020, at least 17% of terrestrial & inland water, and 10% of coastal & marine areas, are conserved through systems of protected areas and other effective area-based conservation measures.
- India's network of protected areas is far below the "Aichi Target".

THINK!

- Monitoring of illegal Killing of Elephants (MIKE)Programme.

Q.48) Recently Red Sanders was in news. Consider the following statements about it.

1. Red Sanders is an endemic tree of South India.
2. They are found in Tropical Moist Deciduous forest.
3. Red Sanders usually grow in the rocky, degraded and fallow lands with Red Soil and hot and humid climate.
4. IUCN has put it under the category of endangered species.

Which of the statements is/are correct?

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

Q.48) Solution (c)

Pterocarpus santalinus or Red Sanders is an **endemic tree of South India.**

They are found in **Tropical Dry Deciduous forest** of the Palakonda and Seshachalam hill ranges of Andhra Pradesh and also found in Tamil Nadu and Karnataka.

Red Sanders usually grow in the rocky, degraded and fallow lands with Red Soil **and hot and dry climate.**

IUCN has put it under the category of **endangered species in the Red List** due to the dwindling population because of illegal felling and smuggling.

Do you know?

- Its export is banned in India in accordance with the CITES and Wildlife Protection Act 1972.
- It is used for various purposes such as immunity medicine, furniture, radiation absorbent, musical instrument, food dyes and spices, Ayurveda and Siddha medicine, decorative and ornamental purposes etc.

THINK!

- Convention on International Trade in Endangered Species (CITES).

Q.49) Consider the following statements about Talle WildLife Sanctuary:

1. Talle Wildlife Sanctuary in Andhra Pradesh.
2. It is one of the homes for clouded leopard.

Which of the statements is/are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) None

Q.49) Solution (b)

Why in News?

Recently, **new Moth species** has been discovered in Talle Wildlife Sanctuary in Arunachal Pradesh. It is the first record of this moth species (Elcysma) in Arunachal Pradesh. The scientifically name of moth is Elcysma Ziroensis, and **commonly called Apatani Glory, named after a local tribe called Apatani.**

Talle WildLife Sanctuary

- It lies roughly in between **the Subansiri, Sipu and Pange Rivers**.
- It is one of the home for clouded leopard (Vulnerable IUCN status).
- Sub-tropical broad leafed, temperate broad leafed and temperate conifer types of vegetation are found here.

Do you know?

Other wildlife reserves in Arunachal Pradesh

- **Wildlife Sanctuary:** Itanagar, Lao, Mehao, Dibang Eagle's Nest Sanctuary, Kamlang, Kane.
- **National Park**: Namdapha, Mouling
- **Biospheric Reserve**: Dihang-Dibang Biosphere Reserve.
- **Clouded Leopard**- IUCN-Vulnerable

THINK!

- Marine Protected Areas.

Q.50) Which of the following state animals are correctly matched?

1. Clouded leopard–Arunachal Pradesh
2. Hangul - Jammu and Kashmir

3. Barahsingha- Madhya Pradesh

Select the code from following:

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

Q.50) Solution (b)

All 29 States and 7 Union Territories of the Republic of India have their own state animals. The motivation for the choice varies from state to state; species to the state are often selected.

Clouded Leopard is the state animal of Meghalaya.

- Himachal Pradesh – Snow Leopard
- Jammu and Kashmir – Kashmir Stag
- Punjab, Haryana, Andhra Pradesh – Blackbuck
- Uttarakhand – Musk Deer
- Rajasthan – Camel
- Uttar Pradesh, Madhya Pradesh – Swamp Deer
- Bihar, Goa, Nagaland – Gaur
- Sikkim – Red Panda
- Assam – One Horned Rhino
- Arunachal Pradesh, Nagaland – Gayal
- Manipur – Sangai
- Mizoram – Serow
- West Bengal – Fishing Cat
- Jharkhand, Karnataka, Kerala – Indian Elephant
- Odisha – Sambar
- Chhattisgarh – Wild Buffalo
- Gujarat – Lion
- Maharashtra: Indian Giant Squirrel
- Telangana – Deer
- Tamil Nadu – Nilgiri Tahr

Q.51) Which of the following species are critically endangered in India?

1. Malabar Civet

2. Red Panda
3. Namdhapa Flying Squirrel
4. Leather back turtle

Select the code from following:

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

Q.51) Solution (c)

Critically Endangered Mammals

1. Pygmy Hog (Porcula salvania).
2. Andaman White-toothed Shrew (Crocidura andamanensis)
3. Jenkin's Andaman Spiny Shrew (Crocidura jenkinsi)
4. Nicobar White-tailed Shrew (Crocidura nicobarica)
5. Kondana Rat (Millardia kondana)
6. Large Rock Rat or Elvira Rat (Cremnomys elvira)
7. Namdapha Flying Squirrel (Biswamoyopterus biswasi)
8. Malabar Civet (Viverra civettina)
9. Sumatran Rhinoceros (Dicerorhinus sumatrensis)
10. Javan Rhinoceros (Rhinoceros sondaicus)

Critically endangered birds in India

1. Migratory Wetland Species – Baer's Pochard (Aythya baeri), Siberian Crane (Leucogeranus leucogeranus), Spoon-billed Sandpiper (Eurynorhynchus pygmeus)
2. Non-migratory Wetland Species – White-bellied Heron (Ardea insignis)
3. Grassland Species – Bengal Florican (Houbaropsis bengalensis), Great Indian Bustard (Ardeotis nigriceps), Jerdon's Courser (Rhinoptilus bitorquatus), Sociable Lapwing (Vanellus gregarius)

1. Forest Species – Forest Owlet (Heteroglaux blewitti)
2. Scavengers – Indian Vulture (Gyps indicus), Red-headed Vulture (Sarcogyps calvus), Slender-billed Vulture (Gyps tenuirostris), White-backed Vulture (Gyps bengalensis).
3. Practically extinct – Himalayan Quail (Ophrysia superciliosa), Pink-headed Duck (Rhodonessa caryophyllacea)

Critically Endangered Reptiles

1. Gharial (Gavialis gangeticus)
2. Hawksbill Turtle (Eretmochelys imbricata)
3. Leatherback Turtle (Dermochelys coriacea)
4. Four-toed River Terrapin or River Terrapin (Batagur baska)
5. Red-crowned Roofed Turtle or the Bengal Roof Turtle (Batagur kachuga)

Critically Endangered Fishes

1. Pondicherry Shark (Carcharhinus hemiodon)
2. Ganges Shark (Glyphis gangeticus)
3. Knife-tooth Sawfish (Anoxypristis cuspidata)
4. Large-tooth Sawfish (Pristis microdon)
5. Long-comb Sawfish or Narrow-snout Sawfish (Pristis zijsron)

Q.52) Which of the following statements is/are correct regarding Flagship species?

1. A flagship species is a species selected to act as an ambassador, icon or symbol for a defined habitat, issue, campaign or environmental cause.
2. Only Keystone species are selected as Flagship species so that other species are also benefitted.

Select the code from below:

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

Q.52) Solution (a)

Flagship species

- A flagship species is a species selected to act as an ambassador, icon or symbol for a defined habitat, issue, campaign or environmental cause.
- By focusing on, and achieving conservation of that species, the status of many other species which share its habitat – or are vulnerable to the same threats - may also be improved.
- Flagship species are usually relatively large, and considered to be 'charismatic' in western cultures.
- Flagship species may or may not be keystone species and may or may not be good indicators of biological process.

Q.53) Consider the following statements:

1. Indicator species is an organism whose presence, absence or abundance reflects a specific environmental condition.
2. Indicator species indicates the different seral levels of succession.
3. Lichens can be used as an indicator species to check the presence of SO_2.

Which of the above statements regarding Indicator species are correct?

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

Q.53) Solution (c)

Indicator Species

An indicator species is an organism whose presence, absence or abundance reflects a specific environmental condition. Indicator species can signal a change in the biological condition of a particular ecosystem, and thus may be used as a proxy to diagnose the health of an ecosystem. For example, plants or lichens sensitive to heavy metals or acids in precipitation may be indicators of air pollution. Indicator species can also reflect a unique set of environmental qualities or characteristics found in a specific place, such as a unique microclimate.

Indicator species are a useful management tool, and can help us delineate an ecoregion, indicate the status of an environmental condition, find a disease outbreak, or monitor

pollution or climate change. In one sense, they can be used as an "early warning system" by biologists and conservation managers. Indicator species must also be accompanied by a thorough study of what is being indicated, what is really correlated, and how this one species fits into the rest of ecosystem.

Think

- Keystone species

Q.54) Ameenpur lake has recently received the Biodiversity Heritage Tag. Consider the following statements regarding this?

1. It is the first water body in India to receive this tag
2. Ameenpur lake lies in Karnataka.
3. The Biodiversity Heritage Tag is awarded by UNESCO

Which of the above statements are correct?

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

Q.54) Solution (a)

Ameenpur Lake

Ameenpur lake, located in the metropolitan area limits of Hyderabad with a number of industrial units nearby, has been designated a biodiversity heritage site.

A major attraction for admirers of birds, particularly the majestic flamingos, is the first water body in the country to get such a status.

The tag is given by National Biodiversity Authority (NBA) under Biodiversity Act, 2002.

Think

- Hydroponics

Q.55) Arrange the following states in the descending order according to the population of tigers in them:

1. Uttarakhand

2. Karnataka
3. Tamil Nadu
4. Madhya Pradesh

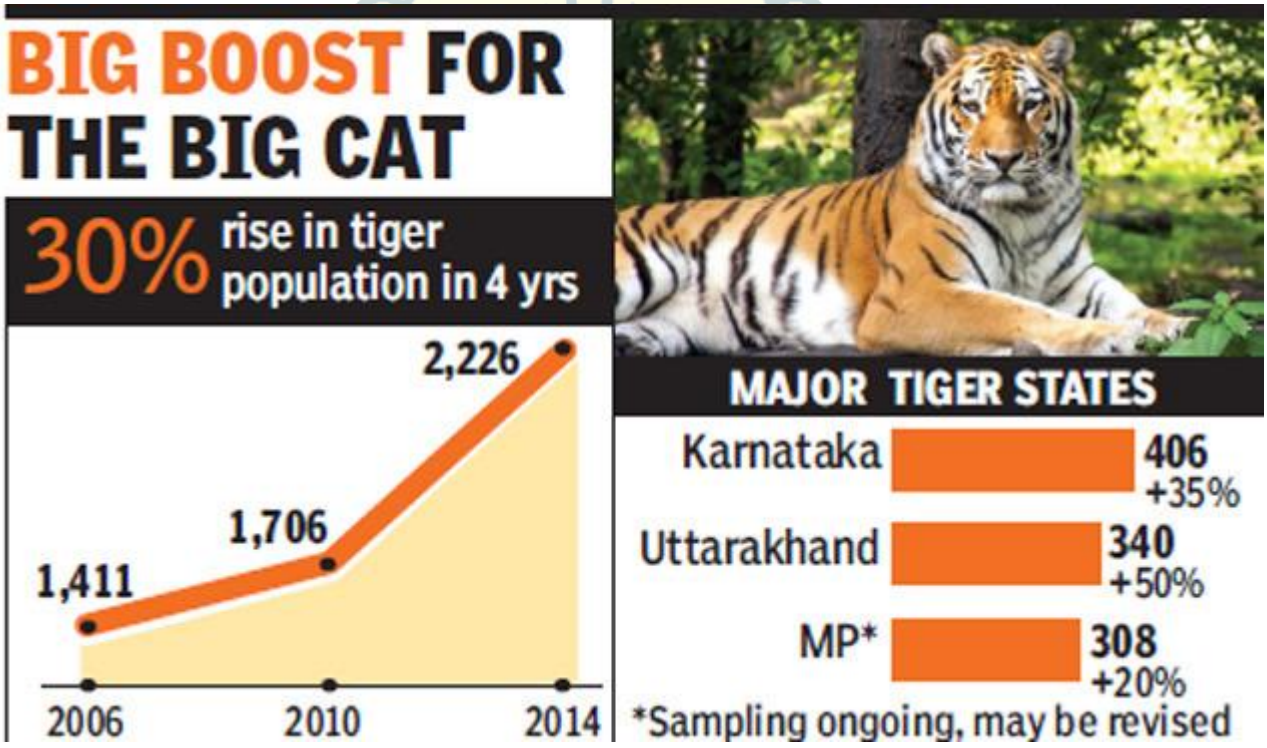
Select the code from below:

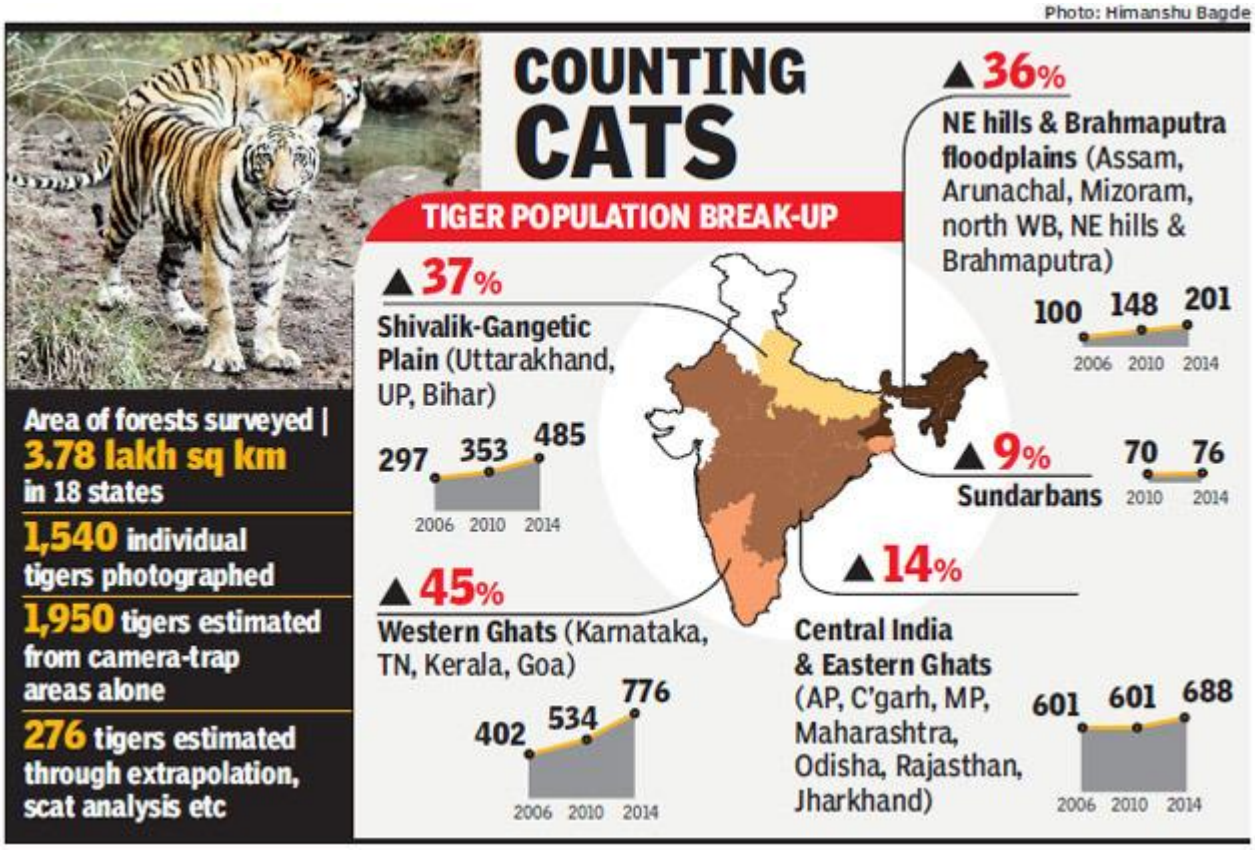
a) 1 – 2 – 3 – 4
b) 2 – 1 – 4 – 3
c) 2 – 3 – 4 – 1
d) 2 – 4 – 3 – 1

Q.55) Solution (b)

State wise distribution of tigers

State-wise, Karnatakas has the highest number of tigers (406) followed by 340 in Uttarakhand, 308 in Madhya Pradesh, 229 in Tamil Nadu, 190 in Maharashtra, 167 in Assam, 136 in Kerala and 117 in Uttar Pradesh.





Q.56) Government of India in collaboration with the Norwegian Government has established a "Centre for Biodiversity Policy and Law (CEBPOL)" in the National Biodiversity Authority (NBA), Chennai. Which of the following activities will be undertaken by CEBPOL?

1. Collect, collate, analyse and disseminate information relating to biodiversity policy and law at regional, national and international levels.
2. Execute short and long-term training courses and sensitisation programmes on biodiversity policies and laws for various target groups.
3. Prepare for the Government of India, country position papers on various aspects relating to biodiversity polices and law for international meetings and negotiations.

Select the code from following:

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

Q.56) Solution (d)

Government of India in collaboration with the Norwegian Government has established a "Centre for Biodiversity Policy and Law (CEBPOL)" in the National Biodiversity Authority (NBA), Chennai, to develop professional expertise in biodiversity policies and laws and develop capacity building. This Centre is focusing on biodiversity policies and laws that cater to the needs of national and international rule-making and subsequent implementation on issues of biodiversity.

Activities of CEBPOL

- Collect, collate, analyse and disseminate information relating to biodiversity policy and law at regional, national and international levels
- Execute short and long-term training courses and sensitisation programmes on biodiversity policies and laws for various target groups including natural resource managers, administrators, decision makers, civil society, media representatives, scientific community, judiciary, academicians and elected public representatives.
- Engage consultants, policy analysts, legal experts and interns on both short-term and long-term basis for providing professional inputs in the training, research, education, analysis and awareness activities of the CEBPOL.
- Prepare for the Government of India, country position papers on various aspects relating to biodiversity polices and law for international meetings and negotiations.
- Establish appropriate linkages with other similar centres / institutions, both nationally and internationally, for developing collaborative programmes and academic exchange in furtherance of the objectives of CEBPOL.

Think

- National Biodiversity Authority

Q.57) The Great Hornbill, Buceros bicornis, is a near threatened species, and is on the IUCN red list. Which of the following statements is NOT true about them?

a) It's the State bird of both Arunachal Pradesh and Kerala
b) They are unique to the Western Ghats
c) Sound of their take off is akin to the start of the steam locomotive of the Nilgiri Mountain Railway
d) None

Q.57) Solution (b)

Why in News?

Great Hornbill, commonly found in many parts of the Blue Mountains flying from one tree to another, may in a matter of time become extremely rare if habitat loss continues at the rate at which it has been happening for sometime now.

The magnificent birds which were also a common sight in the evergreen rain forests of the Western Ghats are now forced, due to deforestation, to adapt themselves to hollows in silver oak trees which form part of thick coffee plantations in Singara and Moyar and some tea plantations in the lower part of the hills.

Do you know?

- Its take off sound is akin to the start of the steam locomotive of the Nilgiri Mountain Railway.
- Hornbills are mostly dependent on wild berries.
- The birds which follow a unique nesting style are also being targeted by poachers for their meat and casques.

Q.58) Recent studies have shown that all citrus species available today came from the foothills of this mountain stretch? Which one are we talking about?

a) The Andes
b) The Appalachian mountains
c) The Himalayas
d) The Alps

Q.58) Solution (c)

When life gives you lemons, blame the Himalayas, as they are the birthplace of all the citrus fruits of the world.

Genomic (DNA study), phylogenetic (study of evolution) and bio-geographic (study of migration and distribution of species through time) studies have now proved that all citrus species available today came from the south-east foothills of the Himalayas, specifically the eastern area of Assam, northern Myanmar and western Yunnan in China.

An international team of over 15 scientists studied 60 diverse species of citrus, including lemons, oranges and grapefruit, and concluded that the fruit fundamentally had just three ancestors. "It is like creating an immense jigsaw puzzle that overlaps to some degree, and then assembling these pieces into larger groups, and assembling the larger groups into even larger parts of the genome," said Frederick Gmitter from the Citrus Research and Education Centre, University of Florida, in a release.

The paper, published in Nature on February 7, describes the origin, evolution and domestication of citrus fruits. They noted that a fossil specimen from Yunnan that dates back to about 8 million years ago has similar traits to modern ones.

http://www.thehindu.com/sci-tech/energy-and-environment/on-the-origin-of-oranges/article22713163.ece

Q.59) Scientists believe more than 75% of creatures in the ocean use this mechanism to lure, intimidate, stun, mislead, find mates and thrive. Which process are we talking about?

a) Chemiluminescence
b) Bioluminescence
c) Phosphorescence
d) Bioflourescence

Q.59) Solution (b)

Scientists find that 76% of creatures in the ocean use light to lure, intimidate, stun, mislead, find mates and thrive.

The living lights emanated from tiny fish with needle-like fangs, and gelatinous brutes with thousands of feeding tentacles. The sheer variety suggested that bioluminescence was fairly common, but no scientist came up with a measurement of the phenomenon.

Now, scientists have succeeded in gauging the actual extent of bioluminescence in the deep ocean.

During 240 research dives in the Pacific, they recorded every occurrence and kind of glowing sea creature — more than 500 types living down as deep as 3 km. The team merged the results into a comprehensive survey. The result? Most of the creatures — a stunning 76% — made their own light, vastly outnumbering the ranks of the unlit, such as dolphins.

Q.60) Consider the following statements in regard to Aquatic Ecosystem:

1. Neustons are unattached organisms which live at the air-water interface
2. Nektons are organisms which remain attached to stems and leaves of rooted plants and substances emerging above the bottom mud
3. Planktons includes both microscopic plants like algae and animals like crustaceans and protozoans
4. Benthos or benthic organisms are those found living in the bottom of the water mass

Which of the above given statement(s) is/are correct?

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

Q.60) Solution (c)

Neustons are unattached organisms which live at the air-water interface such as floating plants

Periphytons are organisms which remain attached to stems and leaves of rooted plants and substances emerging above the bottom mud such as sessile algae and their associated group of animals

Planktons includes both microscopic plants like algae (phytoplanktons) and animals like crustaceans and protozoans (zooplanktons) found in all aquatic ecosystems, except certain swift moving waters.

Nektons are groups which contains animals which are swimmers

Benthos or benthic organisms are those found living in the bottom of the water mass

Q.61) Consider the below statements and select the correct statement from the codes given below:

3. When succession is brought about by living inhabitants of that community itself, the process is called Autotrophic succession
4. When succession is brought about by outside forces is known as Allogenic succession.

Choose the correct answer:

e) 1 only
f) 2 only
g) Both 1 and 2
h) Neither 1 nor 2

Q.61) Solution (b)

Ecological succession is the process of change in the species structure of an ecological community over time. The time scale can be decades (for example, after a wildfire), or even millions of years after a mass extinction.

Autogenic and Allogenic Succession

- When succession is brought about by living inhabitants of that community itself, the process is called autogenic succession, while change brought about by outside forces is known as allogenic succession.

Autotrophic and Heterotrophic succession

- Succession in which, initially the green plants are much greater in quantity is known as autotrophic succession; and the ones in which the heterotrophs are greater in quantity is known as heterotrophic succession.

Q.62) Consider the following about Coral Reefs:

1. Snowflake coral is posing a major threat to the coral reef colonies in the Gulf of Mannar, Gulf of Kutch and the Sunderban Islands.
2. It can destabilize the marine ecosystem because it may crowd out other species like corals, sponges, algae, ascidians that contribute to the rich marine biodiversity of the region.

Choose the correct option

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

Q.62) Solution (b)

Since Sunderban Islands does not have corals (as they don't meet the criteria for coral survival as mentioned below), statement (1) is wrong.

Coral reefs are restricted to narrow latitudinal, horizontal, and vertical ranges along the tropical continental shelves. Their contribution to global coastal biodiversity is disproportionate to their spatial extent: Although they cover less than 1% of the world's oceans, they are inhabited by one-third of globally known marine species.

Do you know?

What Do Coral Reefs Need to Survive?

1. **Sunlight:** Corals need to grow in shallow water where sunlight can reach them. Corals depend on the zooxanthellae (algae) that grow inside of them for oxygen and other things, and since these algae needs sunlight to survive, corals also need sunlight to survive. Corals rarely develop in water deeper than 165 feet (50 meters).

2. **Clear water:** Corals need clear water that lets sunlight through; they don't thrive well when the water is opaque. Sediment and plankton can cloud water, which decreases the amount of sunlight that reaches the zooxanthellae.

3. **Warm water temperature:** Reef-building corals require warm water conditions to survive. Different corals living in different regions can withstand various temperature fluctuations. However, corals generally live in water temperatures of 68–90° F or 20–32° C.

4. **Clean water:** Corals are sensitive to pollution and sediments. Sediment can create cloudy water and be deposited on corals, blocking out the sun and harming the polyps. Wastewater discharged into the ocean near the reef can contain too many nutrients that cause seaweeds to overgrow the reef.

5. **Saltwater:** Corals need saltwater to survive and require a certain balance in the ratio of salt to water. This is why corals don't live in areas where rivers drain fresh water into the ocean ("estuaries").

Q.63) Consider the following pairs in relation to schedules under Wildlife Protection Act, 1972:

Schedule : : Description

1. Schedule I : : includes the animals which may be hunted
2. Schedule II and III : : provides for absolute protection of species and high penalties
3. Schedule IV and V : : species are also protected, but the penalties are much lower
4. Schedule VI : : includes plants that are prohibited for cultivation and planting

Which of the pairs given above is/are incorrectly matched?

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

Q.63) Solution (d)

The Wildlife Protection Act, 1972 is an Act of the Parliament of India enacted for protection of plants and animal species.

The Act provides for the protection of wild animals, birds and plants; and for matters connected therewith or ancillary or incidental thereto.

Among other reforms, the Act established schedules of protected plant and animal species; hunting or harvesting these species was largely outlawed.

It has six schedules which give varying degrees of protection.

- Schedule I and part II of Schedule II provide absolute protection - offences under these are prescribed the highest penalties.
- Species listed in Schedule III and Schedule IV are also protected, but the penalties are much lower.
- Schedule V includes the animals which may be hunted.
- The plants in Schedule VI are prohibited from cultivation and planting.

Q.64) Consider the following statements.

1. Telangana is the first state to have eco-friendly bridges for the movement of tigers.
2. National Tiger Conservation Authority will be the nodal agency for recommending the size and location of eco-bridge.

Which of the above statements is/are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) None

Q.64) Solution (a)

First of its kind, **Telangana State** will have eco-friendly bridges over a canal cutting across the tiger corridor linking the Tadoba-Andhari Tiger Reserve.

Tiger corridor linking the Tadoba-Andhari Tiger Reserve (TATR) in the Chandrapur district of Maharashtra with the forests in Telangana's Kumram Bheem Asifabad district.

The 'eco-bridges' will be constructed at key spots along the 72 km-long with the laying of fertile soil to grow grass and plants over the structure, so that fragmentation of the reserve forest is camouflaged.

National Board of Wildlife will be the nodal agency for recommending the size and location of eco-bridge.

Do you know?

Why is eco-Bridge needed?

- Maintain biodiversity conservation and are important for country's ecological security.
- Help in colonizing new area thus safeguard themselves from inbreeding.
- Reduce man-animal conflict.
- Fulfill the migratory need of animals.

THINK!

- Green corridor

Q.65) Consider the following statements about elephant conservation.

1. Under Wildlife (Protection) Act, 1972 Elephant is a Schedule I animal.
2. Asian elephants are listed as "endangered" in the IUCN Red List of threatened species.
3. Project Elephant is a Centrally Sponsored Scheme.

Which of the above statements is/are *incorrect*?

a) 2 only
b) 2 and 3 only
c) All the above
d) None

Q.65) Solution (d)

Steps Taken for Elephant conservation

Wildlife (Protection) Act, 1972: Under it, Elephant is a **Schedule I animal.**

IUCN Status: Asian elephants are listed **as "endangered"** in the IUCN Red List of threatened species.

Project Elephant: It was launched in the year 1992 as a Centrally Sponsored Scheme

Objectives:

- To protect elephants, their habitat & corridors

- To address issues of man-animal conflict
- Welfare of captive elephants
- Elephant reserves are established across states to achieve above objectives.

Do you know?

Elephant corridors

These are narrow strips of land that allow elephants to move from one habitat patch to another. There are 88 identified elephant corridors in India.

THINK!

- Monitoring of Illegal Killing Of Elephants (MIKE) Programme

Q.66) Consider the following statements about Animal Welfare Board of India.

1. The Animal Welfare Board of India is a statutory advisory body.
2. The Animal Welfare Board of India set up in 1962, in accordance with Wildlife (Protection) Act 1972.
3. Shrimati Rukminl Devi Arundale pioneered the setting up of the Board, with its Headquarters at Chennai.

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 the above

Q.66) Solution (b)

The Animal Welfare Board of India is a **statutory advisory body** on Animal Welfare Laws and promotes animal welfare in the country.

The Animal Welfare Board of India, the first of its kind to be established by any Government in the world, was set up in 1962, in accordance with Section 4 of **the Prevention of Cruelty to Animals Acts 1960.**

Shrimati Rukminl Devi Arundale pioneered the setting up of the Board, with its Headquarters at Chennai. She guided the activities of the Board for nearly twenty years till her demise in 1986.

Do you know?

Functions of The Animal Welfare Board of India

- To keep the law in force in India for the Prevention of Cruelty to Animals under constant study and to advise the government on the amendments to be undertaken in any such law from time to time.
- To advise the Central Government on the making of rules under the Act with a view to preventing unnecessary pain or suffering to animals generally, and more particularly when they are being transported from one place to another or When they are used as performing animals or when they are kept in captivity or confinement.

THINK!

- Central Zoo Authority.

Q.67) Consider the following statements about Coalition Against Wildlife Trafficking.

1. It works to end the illegal trade in wildlife and wildlife products.
2. It is an intergovernmental treaty under the aegis of UNEP.

Which of the above statements is/are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) None

Q.67) Solution (a)

The Coalition Against Wildlife Trafficking (CAWT) aims to focus public and political attention and resources on **ending the illegal trade in wildlife and wildlife products.**

Initiated in 2005, CAWT is a **unique voluntary public-private coalition** of like-minded governments and organizations sharing a common purpose.

Do you know?

- The Convention on the Conservation of Migratory Species of Wild Animals (also known as CMS or Bonn Convention) aims to conserve terrestrial, aquatic and avian migratory species throughout their range.
- **It is an intergovernmental treaty, concluded under the aegis of the United Nations Environment Programme,** concerned with the. Conservation of wildlife and habitats on a global scale.

THINK!

- TRAFFIC

Q.68) Consider the following statements.

1. The Global Tiger Forum (GTF) is an intergovernmental and international body to save the tiger species in the wild.
2. Global Tiger Alliance is an alliance of governments, international agencies, civil society, and the private sector united to save wild tigers from extinction.

Which of the above statements is/are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) None

Q.68) Solution (c)

THE GLOBAL TIGER FORUM (GTF)

The Global Tiger Forum (GTF) is an intergovernmental and international body established with members from willing countries to embark on a worldwide campaign, common approach, promotion of appropriate programmes and controls to save the remaining five sub-species of tigers in the wild distributed Over 14 tiger range countries of the world.

Formed in 1994 with its secretariat at New Delhi, GTF is the only inter-governmental & international body campaigning to save the TIGER worldwide. The General Assembly of GTF shall meet once in three years.

Global Tiger Initiative

An alliance of governments, international agencies, civil society, and the private sector united to save wild tigers from extinction.

Do you know?

- The Economic and Social Council of the United Nations (ECOSOC), established the **United Nations Forum on Forests (UNFF).** In October 2000, a subsidiary body with the main objective to promote "the management, conservation and sustainable development of all types of forests and to strengthen long term political commitment to this end" based on **the Rio Declaration, the Forest Principles, Chapter 11 of Agenda 21** and the outcome Of **Intergovernmental Panel on Forests**

(IPF)/intergovernmental Forum on Forests (IFF) processes and other key milestones of international forest policy.

THINK!

- The International Tropical Timber Organization (ITTO).

Q.69) Consider the following statements.

1. Rajasthan is the first state to have India's first wildlife conservation reserve dedicated exclusively to the blackbuck.
2. Blackbucks are native to the Indian subcontinent that has been classified as endangered (IUCN) in 2017.

Which of the above statements is/are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) None

Q.69) Solution (d)

India's first wildlife conservation reserve dedicated exclusively to the blackbuck has been approved by the state government in **the trans-Yamuna region of Allahabad** in Uttar Pradesh under Wildlife Protection Act, 1972. It is the "first ever conservation reserve" of any kind in U.P.

They are native to the Indian subcontinent that has been classified as Least Concerned in 2017 (earlier status was near threatened by IUCN since 2003). They are now extinct in Bangladesh and Pakistan.

Do you know?

- Bishnoi community is known as protectors of Blackbuck.

THINK!

- Amrita Devi Bishnoi Wildlife Protection Award

Q.70) Consider the following statements.

1. Environmental Information System (ENVIS) is a centrally sponsored scheme, being implemented by MoEF&CC since 1982-83.
2. ENVIS Hubs and ENVIS Resource Partners (RPs) are part of its network.

Which of the above statements is/are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) None

Q.70) Solution (b)

Environmental Information System (ENVIS)

It is a **central sector scheme** not sponsored, being implemented by MoEF&CC since 1982-83.

It is a decentralized network of centers of which some centers dealing with "State of the Environment and Related Issues" are hosted by State Government /UT Administrations, called ENVIS Hubs.

Some are hosted by environment-related governmental and non-governmental organizations/ institutes of professional excellence, with varied thematic mandates pertaining to environment, called the ENVIS Resource Partners (RPs).

Do you know?

- **Green Skills:** Green skills are those skills needed to adapt products, services and processes to climate change and the related environmental requirements and regulations. They include the knowledge, abilities, values and attitudes needed to live in, develop and support a sustainable and resource-efficient society. (OECD definition)
- These skills are required in areas such as such as Renewable energy, Waste water treatment, Climate resilient cities, Green construction, Solid waste management etc.

THINK!

- Green Skill Development Programme (GSDP).

Q.71) Which of the following statements are correct regarding 'Hope spots'?

1. These are the regions of low biodiversity where species have been destroyed because of a natural calamity and can be restored by human intervention.

2. A hope spot is an area of an ocean that needs special protection because of its wildlife and significant underwater habitats.
3. India does not have any hope spots.

Which of the above statements are NOT correct?

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

Q.71) Solution (c)

Note: Incorrect options have been asked.

Hope Spot

A hope spot is an area of an ocean that needs special protection because of its wildlife and significant underwater habitats.

Andaman and Nicobar Islands and Lakshadweep islands have recently been named as the new "hope spots" by the International Union for Conservation of Nature (IUCN) and Mission Blue, an organization involved in the study of oceans.

The two group of islands, considered extremely rich in marine biodiversity, are the first places in India to have been added in the list of 50 global 'hope spots'. Earlier, 13 hope spots had been identified all around the world. The additional list of 31 new hope spots was released by IUCN and Mission Blue.

While about 12 percent of the land around the world is now under some form of protection (as national parks etc.), less than six percent of the ocean is protected in any way. Hope Spots allow us to plan for the future and look beyond current marine protected areas (MPAs), which are like national parks on land where exploitative uses like fishing and deep sea mining are restricted. Hope Spots are often areas that need new protection, but they can also be existing MPAs where more action is needed. They can be large, they can be small, but they all provide hope due to:

- A special abundance or diversity of species, unusual or representative species, habitats or ecosystems
- Particular populations of rare, threatened or endemic species
- A site with potential to reverse damage from negative human impacts
- The presence of natural processes such as major migration corridors or spawning grounds

- Significant historical, cultural or spiritual values
- Particular economic importance to the community

THINK!

- Mission Blue

Q.72) Consider the following statements:

1. Rock Nitrogen is the nitrogen trapped in the Rocks.
2. Rock nitrogen is available to the plants due to weathering of the rocks.

Which of the above statements are correct?

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

Q.72) Solution (c)

Rock Nitrogen

- Prevailing science has indicated that all of the nitrogen on Earth available to plants comes from the atmosphere BUT, more than a quarter comes from Earth's bedrock
- Nitrogen weathering is a globally significant source of nutrition to soils and ecosystems worldwide

Weathering

- Ecosystems need nitrogen and other nutrients to absorb carbon dioxide pollution, and there is a limited amount of it available from plants and soils.
- If a large amount of nitrogen comes from rocks, it helps explain how natural ecosystems like boreal forests are capable of taking up high levels of carbon dioxide.
- But not just any rock can leach nitrogen. Rock nitrogen availability is determined by weathering, which can be physical, such as through tectonic movement, or chemical, such as when minerals react with rainwater.
- Large areas of Africa are devoid of nitrogen-rich bedrock while northern latitudes have some of the highest levels of rock nitrogen weathering
- Mountainous regions like the Himalayas and Andes are estimated to be significant sources of rock nitrogen weathering, similar to those regions' importance to global weathering rates and climate.

- Grasslands, tundra, deserts and woodlands also experience sizable rates of rock nitrogen weathering.

https://www.pressreader.com/india/the-hindu/20180408/282265256001513

Q.73) Recently President of India has planted a Baobab tree in Rashtrapati Bhawan. Which of the following statements regarding Baobab are correct?

1. It is native to Australia and has high medicinal and nutrition value.
2. In India, it is found in small pockets at Gujarat, Maharashtra and Jharkhand.
3. Baobab has high levels of vitamin C, potassium, phosphorous and antioxidants.

Select the code from following:

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

Q.73) Solution (b)

Baobab Tree

- The Baobab, known in India as kalpavriksha or a wish-fulling tree, is a rare sight.
- Across the country, not more than 200 are found say conservationists; mostly in isolated pockets of Gujarat, Maharashtra and a few in Jharkhand.
- The Baobab has high medicinal and nutritional value, much like the Neem tree.
- The Baobab is native to Africa and of the nine species of genus Adansonia in the world, Madagascar is home to six species, while two are native to mainland Africa and the Arabian Peninsula, and one is native to Australia.
- People in many African countries use the Baobab to treat malaria and infertility.
- Baobab powder is very popular in European market ; it used to make porridge and smoothies.
- Baobab has high levels of vitamin C, potassium, phosphorous and antioxidants.
- It lives for 2000 years

https://www.ndtv.com/india-news/this-tree-lives-for-2000-years-president-kovind-plants-a-baobab-sapling-at-rashtrapati-bhavan-garden-1832277

Q.74) A recent study shows that flowering plants have evolved to produce a 'Blue Halo' from there petals. Which of the following statements is correct regarding the Blue Halo?

a) It is invisible to humans but lure pollinating bees
b) It repels the harmful insects by triggering their panic centers.
c) It helps in repelling the harmful UV radiations coming from the sun.
d) None of the above

Q.74) Solution (a)

Blue Halo

- Hundreds of flower species have evolved the ability to project ethereal halos of blue light invisible to humans in order to lure pollinating bees.
- In laboratory experiments, bumblebees were drawn to synthetic flowers designed to generate the same kind of ultraviolent rings.
- The effect occurs in the ultraviolent part of the optical spectrum that we cannot see, but bees can.
- Previous studies have shown that bees in search of nectar-giving plants are attracted to odours, but take most of their cues from colours and petal shapes. Bees are especially sensitive to the band of colours on the light spectrum where blue graduates into ultraviolent.

Process

- Many flowers lack the genetic and biochemical capability to manipulate pigment chemistry into the blue-to-ultraviolent spectrum.
- So arranging the molecules in petals so that reflected sunlight will produce a blue halo emerged as an alternative evolutionary strategy to attract pollinators.
- Remarkably, otherwise divergent species wound up with the same lure.
- Findings suggest the petal ridges that produce 'blue halos' evolved many times across different flower lineages, all converging on this optical signal for pollinators.

Think

- Pollination
- Key stone species

Q.75) Amidst huge protest from the environmentalists, Ministry of Environment and Forest has given clearance to Athirapally project. In which state is it located?

a) Tamil Nadu
b) Karnataka
c) Kerala
d) Andhra Pradesh

Q.75) Solution (c)

Athirapally Project

Location: Athirapally waterfalls, Chalakudy river, Kerala

Capacity: 163 MW

The dam is proposed on the Chalakudy River which is 5th largest river in Kerala with 144 kms length. The Chalakudy River is a tributary of the Periyar River and originates in the Anamalai region of Tamil Nadu. The famous Athirapally and Vazhachal waterfalls are situated on this river. Athirapally waterfall is situated at 1000ft MSL and falling from a height of 80 fts. It is largest waterfall in the state.

In news:

The Union Ministry of Environment and Forest has sanctioned clearance for this proposed project on July 19, 2007 but environmentalist are against this project because it will result in enormous destruction of the riparian ecosystem.

Facts:

The proposed dam will affect 138.6 hector of forestland and livelihood of tribal families depending on the forest and river.

Also a stretch of 28.5 hectares of riparian forest falls under the submergence area while it will reduce or dry up the water-flow of Athirapally waterfall which harnesses ecology and tourism in this area.

EIA and Public hearing was not done before implementation of this program.

The Western Ghats Ecology Expert Panel (WGEEP),led by Mr. Gadgil, constituted by Union Ministry of Environment and Forests to suggest conservation measures for Western Ghats has rejected this proposal.

Q.76) Which of the following species are known as the 'Panda of the sea'?

a) King Penguin
b) Walrus
c) Vaquita porpoise
d) Indian Dugong

Q.76) Solution (c)

Vaquita Porpoise

With an estimated 30 or fewer individuals remaining, vaquita porpoise — the world's most endangered marine mammal — may go extinct by 2018 if no action is taken to save them, a new study warns.

Highlights

- Known as the 'panda of the sea' because of its distinctive markings, the vaquita is endemic to the Upper Gulf of California.
- Unsustainable fishing practices and illegal wildlife trade driven by demand for the swim bladder, has caused the vaquita population to plummet.
- Listed as the most endangered cetacean in the world these mammals are often accidentally killed in gillnets also.

Q.77) Consider the following statements regarding 'Chinnar Wildlife Sanctuary'?

1. CWS the only rehabilitation centre for star tortoises in the country.
2. CWS is the only place in Kerala where star tortoises are known to occur in the wild
3. Pet trade and poaching has made Star Tortoise critically endangered.

Select the code from following:

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

Q.77) Solution (a)

Chinnar Wildlife Sanctuary (CWS)

- CWS the only rehabilitation centre for star tortoises in the country.
- CWS is the only place in Kerala where star tortoises are known to occur in the wild
- Chinnar Wildlife Sanctuary (CWS) is located in the Idukki district of Kerala
- The conservation status of Star Tortoise is Vulnerable.

http://www.thehindu.com/sci-tech/energy-and-environment/chinnar-wildlife-sanctuary-hitches-wagon-to-star-tortoises/article18410581.ece

Q.78) Which among the following are species endemic to the Western Ghats?

1. Malabar large-spotted civet
2. Lion-tailed macaque
3. Brown palm civet
4. Nilgiri tahr

Choose the correct answer using the codes below:

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

Q.78) Solution (d)

Among the species endemic to the Western Ghats are the Malabar large-spotted civet, lion-tailed macaque, brown palm civet and Nilgiri tahr. Hence option (d) is the answer.

Do you know?

Recognised as one of the world's eight "hottest hotspots" of biological diversity, the Western Ghats is older than the Himalayan mountain range.

The forests are home to more than over a thousand species, including 300 species of globally threatened flora and fauna. The major vegetation types are tropical evergreen forests, moist deciduous forests, dry deciduous forests, scrub jungles, sholas, peat bogs and swamps.

THINK!

- Neelakurinji

Q.79) Which of the following substances are Ozone depleting substances?

1. Methyl Chloroform
2. Hydrochlorofluorocarbons
3. Methyl Bromide
4. Methyl Iodide

Select the correct answer using the codes:

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

Q.79) Solution (a)

Methyl Iodide is a naturally occurring substance, however it does not has ozone-depleting properties. Methyl iodide was tested as a possible replacement for methyl bromide as a soil fumigant due to the scheduled removal of methyl bromide from the market. Methyl iodide is a better methylating agent than methyl bromide; it is rapidly destroyed by UV light and therefore unlikely to be involved in stratospheric ozone depletion. The United States Environment Protection Agency has designated the compound a non-ozone layer depleter.

THINK!

- Ozone related conventions and protocols

Q.80) Consider the following statements regarding Earth Hour:

1. It is a worldwide movement organized by UNEP and UNESCO.
2. The event is held worldwide annually encouraging individuals, communities, households and businesses to turn off their essential lights for 2 hours.
3. It is held annually to raise awareness about the climate change and the need to save the planet.

Choose the correct codes:

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

Q.80) Solution (d)

Earth hour is a worldwide movement for the planet organized by the **World Wide Fund for Nature**. The event is held worldwide annually encouraging individuals, communities, households and businesses to turn off their essential lights for One hour, from 8:30 to 9:30 pm, towards the end of March, as a symbol for their commitment to the planet.

It was famously started as a lights-off event in Sydney, Australia, in 2007. Since then, it has grown to engage more than 7000 cities and towns worldwide.

Today, Earth Hour engages a massive mainstream community on a broad range of environmental issues. It is held annually to raise awareness about the climate change and the need to save the planet. The One Hour event continues to remain the key driver of the now larger movements.

Q.81) Which of the following defines the term Putrescibility correctly:

a) It is the process of decomposition of inorganic matter in water by microorganisms using oxygen
b) It is the process of decomposition of organic matter in water by microorganisms using oxygen
c) It is the process of decomposition of inorganic matter in air by microorganisms using oxygen

d) It is the process of decomposition of organic matter in air by microorganisms using oxygen.

Q.81) Solution (b)

Putrescibility: It is the process of decomposition of organic matter in water by microorganisms using oxygen.

Do you know?

Putrescible waste is "solid waste that contains organic matter capable of being decomposed by microorganisms and of such a character and proportion as to cause obnoxious odors and to be capable of attracting or providing food for birds or animals.

Basically, putrescibles are the bits of garbage that decompose and get stinky. This can include food waste, used diapers, and pet waste.

Q.82) Consider the below statements about Marine Ecosystem:

1. They serve as the sink of a large quantity of runoff and wastes from land.
2. Marine water has a high salt content and rich in nitrates and phosphates as compared to freshwater.
3. Marine ecosystem provide good habitat for phytoplankton, zooplankton, aquatic plants and fishes.

Which of the statements given above is/are correct?

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

Q.82) Solution (a)

Marine Ecosystem

- Oceans occupy 70 per cent of earth's surface, offering habitat to numerous plants (mainly algae), animals like zoo plankton, shrimps, oysters, fishes, reptiles, birds and mammals. They serve as the sink of a large quantity of runoff and wastes from land.
- Marine water has a high salt content (about 3.5% by weight) and poor fertility due to lack of nitrates and phosphates as compared to freshwater.

- Marine life is abundant near the shore and in the continental shelf. The species include commercial fishes, large sea mammals like whales and seals.

Freshwater Ecosystem

- Freshwater bodies (ponds, lakes, rivers, springs) are rich in nutrients (nitrates, phosphates) and provide good habitat for phytoplankton, zooplankton, aquatic plants and fishes.

Q.83) Troides minos is the largest butterfly in India. What is the name of the largest butterfly in the world?

a) Queen Alexandra's birdwing
b) Large Blue
c) Lesser Monarch
d) Giant Galapago

Q.83) Solution (a)

Queen Alexandra's birdwing, is the largest butterfly in the world, with females reaching wingspans slightly in excess of 25 cm (9.8 inches).

This birdwing is restricted to the forests of the Oro Province in eastern Papua New Guinea.

The species is endangered, and is one of only three insects (the other two being butterflies as well) to be listed on Appendix I of CITES, making international trade illegal.

Do you know?

- The Queen Alexandra's birdwing was discovered by English naturalist and wildlife collector Albert Stewart Meek in 1906.
- Male Queen Alexandra's birdwings are smaller than the females, but have much brighter colors. Their wings are a shimmering emerald green-blue color, with black stripes and veins.
- Female Queen Alexandra's birdwings are larger than the males. Their wings are brown, and marked with rows of white spots and triangles.

Q.84) The kurinji flower, that blooms every 12 years in the Western Ghats and the Nilgiris are called…

a) Hardy flowering plants

b) Half-hardy flowering plants
c) Gregarious flowering plants
d) Non-gregarious flowering plants

Q.84) Solution (c)

Neela Kurinji or Strobilanthes kunthianus is a shrub predominantly found in the Shola forests of Western Ghats and Nilgiri Hills of South India. It flowers once in 12 years and dies immediately after producing seeds. Such plants are called gregarious flowering plants.

Do you know?

Neela Kurinji in Western Ghats bloom once in twelve years, why?

Flowering is influenced by the surroundings, temperature, time of exposure to sunlight, humidity and favourable circumstances for pollination, seed formation and seed dispersal.

Under these favourable conditions, the receptors such as phytochromes present in the leaves will send the signals to rush more nutrients, carbohydrates, sugars, water and florigens such as Gibberellins (plant hormones) to the meristems to produce floral buds. These floral buds bloom on receiving more sugars and water. But this blooming will take place only when the inhibitors concentration falls below certain critical levels.

In Kurinji plants this happens regularly after a gap of twelve years. The period between each flowering season is called the Oscillatory period. This is under the control of an endogenous oscillator.

In plants like Neela Kurinji, Bamboo etc, the plants take several years to gather resources and prepare themselves for flowering.

By this time the inhibitor levels in Kurinji must have fallen below the critical levels making it suitable for both flowering and seed formation. Hence mass pollination takes place and seed formation occurs. Once the seeds are shed the plants will die.

Hence it is the inbuilt oscillatory mechanism which is responsible for the mass flowering in Neela Kurinji which in turn is controlled by the inhibitors present in the plant itself.

Q.85) With regard to sub-soiling consider the following statements.

1. greater volume of soil may be obtained for cultivation of crops.
2. reduce runoff and soil erosion.
3. excess water may percolate downward to recharge permanent water table.

Which of the above statements is/are correct?

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

Q.85) Solution (d)

Sub soiling: To break the hard -pan beneath the plough layer special tillage operations (chiseling) are performed to reduce compaction. Sub soiling is essentially once in four to five years, where heavy machineries are used for field operations, seeding, harvesting, transporting etc.

- Greater volume of soil may be obtained for cultivation of crops.
- Reduce runoff and soil erosion.
- Excess water may percolate downward to recharge permanent water table.
- Roots of crop plants can penetrate deeper to extract moisture from the water table

Do you know?

- **Blind tillage:** It refers to tillage done after seeding or planting the crop (in a sterile soil) either at the pre - emergence stage of the crop plants or while they are in the early stages of growth so that crop plants (cereals, tuber crops etc.) do not get damaged, but extra plants and broad-leaved weeds are uprooted.

THINK!

- Advantages of Zero tillage.

Q.86) It is defined as direct or indirect harmful effect of one plant over the other crop species through the exudation of toxic substances from the roots or the decomposition of crop residues. It is

a) Forest Pathology
b) Allelopathy
c) Phytochemical
d) Allomone

Q.86) Solution (b)

Forest pathology is the research of both biotic and abiotic maladies affecting the health of a forest ecosystem, primarily fungal pathogens and their insect vectors. It is a subfield of forestry and plant pathology. Forest pathology is part of the broader approach of forest protection.

An allomone is any chemical substance produced and released by an individual of one species that affects the behavior of a member of another species to the benefit of the originator but not the receiver. Production of allomones is a common form of defense, particularly by plant species against insect herbivores.

Phytochemicals are chemical compounds produced by plants, generally to help them thrive or thwart competitors, predators, or pathogens. The name comes from meaning 'plant'. Some phytochemicals have been used as poisons and others as traditional medicine.

Allelopathy: is defined as direct or indirect harmful effect of one plant over the other crop species through the exudation of toxic substances from the roots or the decomposition of crop residues.

Do you know?

- Allelopathy is characteristic of certain plants, algae, bacteria, coral, and fungi. Allelopathic interactions are an important factor in determining species distribution and abundance within plant communities and are also thought to be important in the success of many invasive plants. For specific examples, see spotted knapweed (Centaurea maculosa), garlic mustard (Alliaria petiolata), Casuarina/Allocasuarina spp., and nutsedge.

THINK!

- Antioxidants

Q.87) The Earth Summit resulted in which of the following documents

1. Rio Declaration on Environment and Development
2. Agenda21
3. Forest Principles

Select the correct answer using the codes given below.

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

Q.87) Solution (a)

United Nations Conference on Environment and Development (UNCED) Also known as the Rio Summit, Rio Conference, Earth Summit held in Rio de Janeiro in June 1992.

The Earth Summit resulted in the following documents:

- Rio Declaration on Environment and Development
- Agenda21
- Forest Principles

Do you know?

The Earth Summit resulted two important legally binding agreements

- Convention on Biological Diversity
- Framework Convention on Climate Change (UNFCCC)

THINK!

- Local Agenda 21.

Q.88) With regard to Sustainable Development Goals (SDGs) consider the following statements.

1. These are also known as "Transforming our World: the 2030 Agenda for Sustainable Development".
2. The SDGs build on the principles agreed upon in entitled "The Future We Want".

Which of the above statements is/are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) None

Q.88) Solution (c)

The Sustainable Development Goals (SDGs) are a collection of 17 global goals set by the United Nations. The broad goals are interrelated though each has its own targets to achieve. The total number of targets is 169.

The SDGs are also known as "Transforming our World: the 2030 Agenda for Sustainable Development" or 2030 Agenda in short. The are also known as the Global Goals for Sustainable Development.

The SDGs build on the principles agreed upon in Resolution A/RES/66/288, **entitled "The Future We Want".** This was a non-binding document released as a result of Rio+20 Conference held in 2012.

Do you know?

- The Government of India established the **NITI Aayog to attain the sustainable development goals.** In March 2018 Haryana became the first state in India to have its annual budget focused on the attainment of SDG with a 3-year action plan and a 7-year strategy plan to implement sustainable development goals.

THINK!

- Action for climate empowerment (ACE)

Q.89) 'Our Common Future' report released by

a) Brundtland Commission.
b) UN Conference on the Human Environment
c) United Nations Conference on Environment and Development
d) General Assembly Special Session on the Environment

Q.89) Solution (a)

Formerly known as the World Commission on Environment and Development (WCED), the mission of the Brundtland Commission is to unite countries to pursue sustainable development together.

The Brundtland Commission officially dissolved in December 1987 after releasing **Our Common Future**, also known as the Brundtland Report, in October 1987, a document which coined, and defined the meaning of the term "Sustainable Development".

Do you know?

The report deals with sustainable development and the change of politics needed for achieving it. The definition of this term in the report is quite well known and often cited:

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs". It contains two key concepts:

- the concept of "needs", in particular the essential needs of the world's poor, to which overriding priority should be given; and
- the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs."

THINK!

- Limits To Growth

Q.90) With regard to Social Progress Index consider the following statements.

1. It measures the extent to which countries provide for the only the social needs of their citizens.
2. It is based on the writings of Amartya Sen, Douglass North, and Joseph Stiglitz.

Which of the above statements is/are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) None

Q.90) Solution (b)

The Social Progress Index (SPI) **measures the extent to which countries provide for the social and environmental needs of their citizens**. Fifty-four indicators in the areas of basic human needs, foundations of well-being, and opportunity to progress show the relative performance of nations.

The index is published by the nonprofit **Social Progress Imperative**, and is based on the writings of **Amartya Sen, Douglass North, and Joseph Stiglitz**. The SPI measures the well-**being of a society by observing social and environmental outcomes directly rather than the economic factors.** The social and environmental factors include wellness (including health, shelter and sanitation), equality, inclusion, sustainability and personal freedom and safety.

Do you know?

Two key features of the Social Progress Index are:

- the exclusion of economic variables
- the use of outcome measures rather than inputs

THINK!

- Happy Planet Index

Q.91) With regard to World Summit on Sustainable Development (2002) consider the following statements.

1. It is also known as Rio+10 conference.
2. It was held in Rio de Janeiro.

Which of the above statements is/are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) None

Q.91) Solution (a)

World Summit on Sustainable Development (2002)

- Convened by General Assembly resolution 55/199 of 20 December 2000
- Also known as Rio +10
- **Held in Johannesburg, 26 August - 4 September 2002**
- Reviewed progress in the implementation of Agenda 21 since its adoption in 1992

Outcome document includes

- Johannesburg Declaration on Sustainable Development
- Plan of Implementation

Do you know?

UN Conference on Sustainable Development (2012)

- Called for by General Assembly resolution 66/197
- Known as Rio+20
- Held in Rio de Janeiro, 20-22 June 2012
- Outcome document A/CONF.216/16, includes "The future we want"

THINK!

- Earth Summit

Q.92) Megadiverse Nation status is conferred by Conservation International. Which of the following statements are correct regarding Mega Biodiverse Nations?

1. They should have 0.5% of the total species of vascular plants or 1000 endemic vascular plant species.
2. They should have a marine ecosystem.
3. India is Mega biodiverse Nation.

Select the code from following:

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

Q.92) Solution (b)

Megadiversity Country

The term megadiverse country refers to any one of a group of nations that harbor the majority of Earth's species and high numbers of endemic species. Conservation International identified 17 megadiverse countries in 1998. Many of them are located in, or partially in, tropical or subtropical regions.

Mega diversity means exhibiting great diversity. The main criteria for megadiverse countries is endemism at the level of species, genera and families. A megadiverse country must have at least 5,000 species of endemic plants and must border marine ecosystems.

In alphabetical order, the 17 megadiverse countries are:

- Australia
- Brazil
- China
- Colombia
- Democratic Republic of the Congo
- Ecuador
- India
- Indonesia
- Madagascar

- Malaysia
- Mexico
- Papua New Guinea
- Peru
- Philippines
- South Africa
- United States of America
- Venezuela

Think

- Megadiversity Hotspot
- Conservation International

Q.93) Biodiversity is seen at different levels. Which of the following statements is/are correct regarding genetic diversity?

1. It refers to differences in genetic make – up of individuals in a particular species.
2. It helps specie to adapt to changing environment increasing its chances of survival.

Select the code from following:

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

Q.93) Solution (c)

Genetic Diversity

Genetic diversity is the total number of genetic characteristics in the genetic makeup of a species. It is distinguished from genetic variability, which describes the tendency of genetic characteristics to vary.

Genetic diversity serves as a way for populations to adapt to changing environments. With more variation, it is more likely that some individuals in a population will possess variations of alleles that are suited for the environment. Those individuals are more likely to survive to produce offspring bearing that allele. The population will continue for more generations because of the success of these individuals.

Think

- Species Diversity
- Ecosystem Diversity

Q.94) Which of the following abiotic factors are responsible for maintaining biodiversity in the World?

1. Temperature
2. Water
3. Sunlight
4. soil
5. Honey bees

Select the code from following:

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

Q.94) Solution (b)

Temperature – Life processes of plant is governed by temperature. Germination of seeds, fruiting, flowering etc takes place at a particular temperature. Even fauna behaves according to temperature. There are species which can adjust to wide range of temperature while some cannot.

Water – Next to temperature, water is the most important factor influencing the life of organisms. Amount of rainfall or availability of water through rivers and lakes determines the type of vegetation.

Light – Since plants produce food through photosynthesis, a process which is only possible when sunlight is available as a source of energy, we can quickly understand the importance of light for living organisms, particularly autotrophs. Many species of small plants (herbs and shrubs) growing in forests are adapted to photosynthesise optimally under very low light conditions because they are constantly overshadowed by tall, canopied trees. Many plants are also dependent on sunlight to meet their photoperiodic requirement for flowering. For many animals too, light is important in that they use the diurnal and seasonal variations in light intensity and duration (photoperiod) as cues for timing their foraging, reproductive and migratory activities.

Soil – The nature and properties of soil in different places vary; it is dependent on the climate, the weathering process, whether soil is transported or sedimentary and how soil development occurred. Various characteristics of the soil such as soil composition, grain size and aggregation determine the percolation and water holding capacity of the soils. These characteristics along with parameters such as pH, mineral composition and topography determine to a large extent the vegetation in any area. This is in turn dictates the type of animals that can be supported.

Q.95) Which of the following statements are correct regarding Eurythermal Animals?

1. These animals are able to sustain a long range of temperature.
2. Their bodies are able to maintain a constant internal temperature irrespective of change in external temperature.
3. They migrate or hibernate in case of extreme cold temperatures.

Select the code from following:

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

Q.95) Solution (a)

Eurythermal Organisms

A eurytherm is an organism, often specifically an ectotherm, that can function at a wide range of body temperatures. Examples of Eurytherms include desert pupfish, which can function in waters from 4º to 45ºC.

The sustained supply of oxygen to body tissues limits the body temperature range of an organism. Eurytherms that live in environments with large temperature changes adapt to higher temperatures through a variety of methods. For some species, initial warming results in an increase of oxygen consumption and heart rate, accompanied by a decrease in stroke volume and haemolymph oxygen partial pressure. Further warming causes dissolved oxygen levels to decrease below the threshold of full haemocyanin oxygen saturation. The progressive release of haemocyanin bound oxygen as a result of heating follows an exponential pattern, saving energy in oxygen transport and resulting in an associated leveling off of metabolic rate.

Think

- Stenothermal organism

Q.96) Which of the following adaptations are correctly matched?

1. Desert plants have a thick cuticle on their leaf surfaces and have their stomata arranged in deep pits
2. Mammals from colder climates generally have shorter ears and limbs to minimise heat loss.
3. Aquatic mammals have thick layer of fat under their skin.
4. People living in higher altitude have higher Red blood cell count.

Select the code from following:

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

Q.96) Solution (d)

Adaptations

Some organisms possess adaptations that are physiological which allow them to respond quickly to a stressful situation.

Altitude sickness is one such condition. Its symptoms include nausea, fatigue and heart palpitations. This is because in the low atmospheric pressure of high altitudes, the body does not get enough oxygen. But, gradually you get acclimatised and stop experiencing altitude sickness. The body compensates low oxygen availability by increasing red blood cell production, decreasing the binding capacity of hemoglobin and by increasing breathing rate. Many tribes live in the high altitude of Himalayas. They normally have a higher red blood cell count (or total hemoglobin) than people living in the plains.

Mammals from colder climates generally have shorter ears and limbs to minimise heat loss. (This is called the Allen's Rule.) In the polar seas aquatic mammals like seals have a thick layer of fat (blubber) below their skin that acts as an insulator and reduces loss of body heat.

Q.97) Keystone species play an important part in an ecosystem. Which of the following statements is/are correct regarding keystone species?

1. The removal of these species from ecosystem can destroy the entire ecosystem.
2. These species are usually critically endangered.

Select the code from following:

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

Q.97) Solution (a)

Keystone Specie

A keystone species is a species that has a disproportionately large effect on its environment relative to its abundance. Such species are described as playing a critical role in maintaining the structure of an ecological community, affecting many other organisms in an ecosystem and helping to determine the types and numbers of various other species in the community. A keystone species is a plant or animal that plays a unique and crucial role in the way an ecosystem functions. Without keystone species, the ecosystem would be dramatically different or cease to exist altogether. Some keystone species, such as the wolf, are also apex predators.

The role that a keystone species plays in its ecosystem is analogous to the role of a keystone in an arch. While the keystone is under the least pressure of any of the stones in an arch, the arch still collapses without it.

Think

- Umbrella Species

Q.98) Which of the following statements correctly explains 'Catabolism'?

a) It refers to breaking down of detritus material into smaller particles.
b) It refers to break down of organic material into smaller inorganic molecules.
c) It refers to the process of digestion of food in the digestion system.
d) None of the above

Q.98) Solution (b)

Fragmentation and Catabolism

Detritivores (e.g., earthworm) break down detritus into smaller particles. This process is called fragmentation.

By the process of leaching, water- soluble inorganic nutrients go down into the soil horizon and get precipitated as unavailable salts. Bacterial and fungal enzymes degrade detritus into simpler inorganic substances. This process is called as catabolism.

Think

- Humification
- Anerobic decomposition

Q.99) Consider the below statements with reference to Koalas:

1. Koala bears are carnivoran mammals of the family Ursidae.
2. They are found on the continents of North America, Europe, and Australia.
3. They are considered to be vulnerable according to IUCN.

Which of the statements given above is/are correct?

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

Q.99) Solution (b)

About Koalas

- IUCN Status: Vulnerable
- Endemic to Australia. Koalas are found in the eucalyptus forests of eastern Australia.
- It is an arboreal herbivorous marsupial native to Australia.
- Koalas typically inhabit open eucalypt woodlands, and the leaves of these trees make up most of their diet. Because this eucalypt diet has limited nutritional and caloric content, koalas are largely sedentary and sleep up to 20 hours a day.
- Koalas get almost all their moisture from the leaves they eat, and rarely drink water.
- Eucalyptus leaves are super tough and poisonous! Luckily for koalas, they have a long digestive organ called a cecum which allows them to break down the leaves unharmed.

Q.100) India has launched Green Growth Equity Fund (GGEF) to invest in green Infrastructure Projects. Which of the following statements regarding GGEF are correct?

1. It is a joint fund between India and European Union.
2. It aims to leverage private sector funding in Green Infrastructure projects in India.
3. The joint fund will be established under NIIF.

Select the code from below:

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

Q.100) Solution (b)

Green Growth Equity Fund

- India and the UK announced the launch of an Early Market Engagement for the joint UK-India Fund, namely a Green Growth Equity Fund
- It aims to leverage private sector investment from the City of London to invest in green infrastructure projects in India
- Both governments will invest up to £120 million each (i.e. totally £ 240 million)
- The joint fund which will be established under the NIIF framework.

Q.101) Consider the below statements with regard to National Adaptation Fund for Climate Change (NAFCC)

1. It is a Central Sector Scheme.
2. The projects related to adaptation in sectors such as agriculture, animal husbandry, water, forestry, tourism etc. are eligible for funding under NAFCC.
3. National Action Plan on Climate Change (NAPCC) is the National Implementing Entity for implementation of adaptation projects under NAFCC.

Which of the above given statement(s) is/are correct?

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

Q.101) Solution (a)

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. National Bank for Agriculture and Rural Development (NABARD) is the National Implementing Entity (NIE).

Q.102) National Wetland Atlas has been prepared by which of the following?

a) Ministry of Water Resources
b) Wetland International
c) Survey of India
d) Indian Space Research Organization

Q.102) Solution (d)

The National Wetland Atlas was prepared by the ISRO in 2011.

It found that India has over 2,00,000 wetlands. But a vast majority had not been notified as wetlands thus running the risk of being destroyed.

Q.103) Which of the statements given below is/are correct?

1. National Ganga Council is under chairmanship of Hon'ble Prime Minister of India.
2. Empowered Task Force (ETF) on river Ganga under chairmanship of Hon'ble Union Minister of Water Resources, River Development and Ganga Rejuvenation.

Choose the correct code from the following

a) 1 only
b) 2 only
c) Both
d) None

Q.103) Solution (c)

About National Mission for Clean Ganga (NMCG) and National Ganga River Basin Authority (NGRBA)

- NMCG was registered as a society under the Societies Registration Act 1860.
- It acted as implementation arm of National Ganga River Basin Authority (NGRBA) which was constituted under the provisions of the Environment (Protection) Act (EPA), 1986.
- NGRBA has since been dissolved with effect from the 7th October 2016, consequent to constitution of National Council for Rejuvenation, Protection and Management of River Ganga (referred as National Ganga Council)
- National Ganga Council is under chairmanship of Hon'ble Prime Minister of India.
- Empowered Task Force (ETF) on river Ganga under chairmanship of Hon'ble Union Minister of Water Resources, River Development and Ganga Rejuvenation.

Q.104) What is a Mixotroph?

a) It is an organism that can use different sources of energy and carbon
b) It is an automaton that displays human-like traits
c) It is a bacteria that can behave like a virus
d) It is an organism that cannot produce its own food, relying instead on the intake of nutrition from other sources of organic carbon

Q.104) Solution (a)

A mixotroph is an organism that can use a mix of different sources of energy and carbon, instead of having a single trophic mode on the continuum from complete autotrophy at one end to heterotrophy at the other.

Do you know?

- Mixotrophs can be either eukaryotic or prokaryotic. They can take advantage of different environmental conditions.

Q.105) This bird, found only in the arid grasslands and scrub lands of central and west-central India including Gujarat, Uttar Pradesh and Maharashtra, is known for its ability to mimic 34 other bird species. Which bird is this?

a) Rose-ringed parakeet
b) Common Minah
c) Tawny lark

d) Red-whiskered Bulbul

Q.105) Solution (c)

Do you know?

Tawny lark: the dull brown-coloured bird that is small enough to fit in your palm can imitate calls of 34 other birds found in its habitat, and even shepherds' whistles.

Many birds mimic the calls of other birds to impress females during territorial displays, to discourage competing species from using the area and to teach their young to associate the calls of other birds with danger. The diminutive crested Tawny lark – found only in the arid grasslands and scrub lands of central and west-central India including Gujarat, Uttar Pradesh and Maharashtra – belongs to a family of larks well-known for their mimicking abilities.

Male Tawny larks imitate the calls of 34 other bird species, including babblers and lapwings, with varied accuracy.

Interestingly, they even mimicked a squirrel and whistles of local shepherds – indicating that the birds learn from their surroundings.

Birds often learn to mimic other birds and sounds they hear, like Australia's Superb lyrebird which can imitate chainsaws and car alarms. Though mimicry is poorly-studied and its functions highly debated, it is thought to influence the behaviour of birds (of the same species and others) that are listening.

Source: http://www.thehindu.com/sci-tech/science/for-a-lark-this-bird-imitates-34-others/article19897541.ece

Q.106) Which of the following statements best describes 'Ecotype'?

a) It is a type of marine ecosystem that provides an alternative to a species of terrestrial for growth and survival.
b) It is a transition area between two biomes where communities interact.
c) It is a genetically distinct variety within a species, which is adapted to specific environmental conditions.
d) It is a type of ecosystem in which inherent balance is maintained between autotrophs and heterotrophs.

Q.106) Solution (c)

In evolutionary ecology, an ecotype, sometimes called ecospecies, describes a genetically distinct geographic variety, population or race within a species, **which is genotypically adapted to specific environmental conditions.**

Typically, though ecotypes exhibit phenotypic differences (such as in morphology or physiology) stemming from environmental heterogeneity, they are capable of interbreeding with other geographically adjacent ecotypes without loss of fertility or vigor.

Do you know?

- Earthworms fall into four different ecotypes. Compost earthworms prefer warm and moist environments with a ready supply of fresh compost material.
- Epigeic earthworms live on the surface of the soil in leaf litter and tend not to make burrows but live in and feed on the leaf litter.
- Endogeic earthworms live in and feed on the soil, making horizontal burrows through the soil to move around and to feed and they will reuse these burrows to a certain extent.
- Anecic earthworms make permanent vertical burrows in soil, feeding on leaves on the soil surface that they drag into their burrows.

THINK!

- Ecotope

Q.107) Consider the following pairs.

Aquatic organism	Meaning
1. Plankton	Microscopic plants and animals
2. Neuston	Animals which can swim
3. Benthos	Organisms found on the bottom of the water body
4. Nekton	Floating organisms inhabiting the surface layer

Which of the following pairs is/are correctly matched?

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

Q.107) Solution (c)

Based on their life form or location, aquatic organisms (both flora and fauna) are classified into five groups:

Neustons: Unattached organisms which live at air-water interface such as floating plants etc.

Periphytons: There are organisms which remain attached to stems and leaves of rooted plants or substances emerging above the bottom mud such as sessile algae.

Planktons: These are free floating species with limited powers of locomotion. This group includes microscopic plants like algae (phytoplankton) and animals like crustaceans and protozoans (zooplankton).

Nektons: This group includes animals which are swimmers. The animals range in size from the swimming insects to the largest animals, blue whale.

Benthos: These are found living in the bottom of the water mass.

Do you know?

Plankton are primarily divided into broad functional (or trophic level) groups:

- **Phytoplankton** (from Greek phyton, or plant), autotrophic prokaryotic or eukaryotic algae that live near the water surface where there is sufficient light to support photosynthesis. Among the more important groups are the diatoms, cyanobacteria, dinoflagellates and coccolithophores.
- **Zooplankton** (from Greek zoon, or animal), small protozoans or metazoans (e.g. crustaceans and other animals) that feed on other plankton. Some of the eggs and larvae of larger nektonic animals, such as fish, crustaceans, and annelids, are included here.
- **Bacterioplankton,** bacteria and archaea, which play an important role in remineralising organic material down the water column (note that prokaryotic phytoplankton are also bacterioplankton).
- **Mycoplankton,** fungi and fungus-like organisms, which, like bacterioplankton, are also significant in remineralisation and nutrient cycling.

THINK!

- Iron fertilization

Q.108) Which of the following is the correct sequence of an aquatic food chain?

a) Dinoflagellates - Amphipod - Squid
b) Dinoflagellates - Squid - Amphipod

c) Amphipod - Squid - Dinoflagellates
d) Squid - Dinoflagellates – Amphipod

Q.108) Solution (a)

Phytoplankton, also known as microalgae, is similar to terrestrial plants in that they contain chlorophyll and require sunlight in order to live and grow. Most phytoplankton are buoyant and float in the upper part of the ocean, where sunlight penetrates the water.

The two main classes of phytoplankton are dinoflagellates and diatoms. Dinoflagellates use a whip-like tail, or flagella, to move through the water and their bodies are covered with complex shells. Diatoms also have shells, but they are made of a different substance and their structure is rigid and made of interlocking parts. Diatoms do not rely on flagella to move through the water and instead rely on ocean currents to travel through the water.

In a balanced ecosystem, phytoplankton provide food for a wide range of sea creatures including Zooplankton (like Crustaceans, Protozoa), **Squid and larger fishes.** Copepods and **Amphipods are Crustaceans.**

Do you know?

Biofloc culture

- It is an innovative and cost-effective technology in which toxic materials to the fish and shellfish such as Nitrate, Nitrite, Ammonia can be converted to useful product, ie., proteinaceous feed. It is the technology used in aquaculture system with limited or zero water exchange under high stocking density, strong aeration and biota formed by biofloc. The culture of biofloc will be productive in the case of culture tanks exposed to sun.

THINK!

- Biosparging

Q.109) Consider the following pairs:

Biome type	Vegetation type
1. Taiga	Devoid of trees, except stunted shrubs
2. Savannah	Grasses with scattered trees and fire resisting thorny shrubs
3. Temperate	Broad-leaved trees with less diversity of plant species

Which of the pairs given above is/are correctly matched?

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

Q.109) Solution (b)

In the higher latitudes (50°-70°) of Northern hemisphere, the **Coniferous forests are** found. These are also called as Taiga. These forests are also seen in the higher altitudes.

In Tundra type of vegetation, the growth of natural vegetation is very limited. Only mosses, lichens and very small shrubs are found here. It grows during the very short summer. This is called Tundra type of vegetation. This vegetation is found in the polar areas of Europe, Asia and North America.

Tropical grasslands: These grow on either side of the equator and extend till the tropics. This vegetation grows in the areas of moderate to low amount of rainfall. They can grow very tall, about 3 to 4 metres in height. Savannah grasslands of Africa are of this type. Savannah shrubs are fire-resistent which helps them survive periodic, natural fire spread in forests. Thus, pair 2 is correctly matched.

Temperate forests have moderately dense broad-leaved trees and have less diversity of plant species. Oak, Beach, Maple etc. are some common species. Thus, pair 3 is correctly matched.

Do you know?

- Tropical rainforests are rainforests that occur in areas of tropical rainforest climate in which there is no dry season – all months have an average precipitation of at least 60 mm – and may also be referred to as lowland equatorial evergreen rainforest.
- True rainforests are typically found between 10 degrees north and south of the equator (see map); they are a sub-set of the tropical forest biome that occurs roughly within the 28-degree latitudes (in the equatorial zone between the Tropic of Cancer and Tropic of Capricorn).

THINK!

- Monsoon forest

Q.110) With reference to cold water corals, which of the following statements is/are correct?

1. They do not require Zooxanthellae to survive.
2. Worldwide distribution of cold water coral reef is greater than tropical reef.

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.110) Solution (c)

Cold-water corals extend to deeper, darker parts of the oceans than tropical corals, ranging from near the surface to the abyss, beyond 2,000 meters where water temperatures may be as cold as 4 °C. They inhabit deep water, not shallow water**. Like tropical corals, they provide habitat to other species, but deep-water corals do not require zooxanthellae to survive.**

United Nations Environment Programme reports that there are more cold-water coral reefs worldwide than tropical reefs. Their extent is much larger than their tropical counterpart. Some, as the various individual reefs stretching from Norway as far south as West Africa, are when combined far bigger than more famous tropical ones such as Australia's Great Barrier Reef.

Do you know?

- **Cays** – small, low-elevation, sandy islands formed on the surface of coral reefs from eroded material that piles up, forming an area above sea level; can be stabilized by plants to become habitable; occur in tropical environments throughout the Pacific, Atlantic and Indian Oceans (including the Caribbean and on the Great Barrier Reef and Belize Barrier Reef), where they provide habitable and agricultural land.

THINK!

- Habili

Q.111) Consider the following statements regarding dissolved oxygen in an aquatic ecosystem:

1. It increases with increase in temperature of a water-body.

2. Its concentration in fresh water is usually more than the concentration of oxygen in air.
3. Snow cover of ice on water reduces dissolved oxygen concentration.

Which of the statements given above is/are correct?

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

Q.111) Solution (b)

The solubility of oxygen decreases as temperature increases. Warm water also enhances the decomposer activity. There dissolved oxygen concentration decreases, not increases, with increase in temperature of water-body.

Its concentration in fresh water is usually more than 100 times less than the concentration of Oxygen in air.

Snow cover doesn't allow transfer of oxygen from atmosphere. It also reduces the photosynthesis activities by aquatic plants. Thus, there is reduction in dissolved oxygen concentration.

Do you know?

- In environmental chemistry, the chemical oxygen demand (COD) is an indicative measure of the amount of oxygen that can be consumed by reactions in a measured solution. It is commonly expressed in mass of oxygen consumed over volume of solution which in SI units is milligrams per litre (mg/L).
- COD test can be used to easily quantify the amount of organics in water. The most common application of COD is in quantifying the amount of oxidizable pollutants found in surface water (e.g. lakes and rivers) or wastewater. COD is useful in terms of water quality by providing a metric to determine the effect an effluent will have on the receiving body, much like biochemical oxygen demand (BOD).

THINK!

- Carbonaceous biochemical oxygen demand

Q.112) With reference to 'Algal Blooms', which of the following statements is/are correct?

1. They are always harmful for aquatic ecosystem.

2. They are called 'Red Tides'.
3. Algal blooms can occur in freshwater as well as marine environments.

Select the correct answer using the code given below.

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

Q.112) Solution (c)

Not all algal blooms are harmful, some can actually be beneficial. Phytoplankton (Algae) are found at the base of the marine food chain therefore all other life in the ocean relies on phytoplankton. **Blooms can also be a good indicator of environmental change not only in the water, but also on land.** Algal blooms may occur in freshwater as well as marine environments.

Algal blooms are commonly called as red tides because many times, they turn water red. However, algal blooms could be of other colors as well like green, blue, red or brown. Thus, scientists prefer the term - harmful algal bloom.

Do you know?

- An indicator species is an organism whose presence, absence or abundance reflects a specific environmental condition. Indicator species can signal a change in the biological condition of a particular ecosystem, and thus may be used as a proxy to diagnose the health of an ecosystem. For example, plants or lichens sensitive to heavy metals or acids in precipitation may be indicators of air pollution.

THINK!

- Keystone species

Q.113) Second phase of National Monsoon Mission started in 2017. Which of the following statements is/are correct regarding the Mission?

1. It has been launched by Ministry of Drinking water and sanitation.
2. The objective of the program is to increase the amount of rainfall during monsoon season and increase water harvesting.

Select the code from following:

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

Q.113) Solution (d)

National Monsoon Mission

Under the National Monsoon Mission initiative, the Indian Institute of Tropical Meteorology (IITM), Pune, Indian National Centre for Ocean Information Services (INCOIS), Hyderabad and National Centre for Medium Range Weather Forecasting (NCMRWF), NOIDA have embarked upon to build a state-of-the-art coupled ocean atmospheric model for:-

(a) improved prediction of monsoon rainfall on extended range to seasonal time scale (16 days to one season) and (b) improved prediction of temperature, rainfall and extreme weather events on short to medium range time scale (up to 15 days) so that forecast skill gets quantitatively improved further for operational services of India Meteorological Department (IMD).

Note: The Mission comes under Ministry of Earth Sciences.

Q.114) Secure Himalaya Project has been launched by Ministry of Environment, Forest and Climate Change. Which of the following statements are correct regarding Secure Himalaya Project?

1. The aim of the project is to ensure conservation of locally and globally significant biodiversity, land and forest resources in the high Himalayan ecosystem.
2. The project will be implemented in all the Himalayan states from J and K to Arunachal Pradesh.
3. Protection of snow leopard and other endangered species and their habitats is one of the key components of the project,

Select the code from following:

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

Q.114) Solution (c)

Note: The project is launched in four states – Jammu and Kashmir, Himachal Pradesh, Uttarakhand and Sikkim.

The by Ministry of Environment, Forest and Climate Change launched a six-year project to ensure conservation of locally and globally significant biodiversity, land and forest resources in the high Himalayan ecosystem spread over four states in India.

Protection of snow leopard and other endangered species and their habitats is one of the key components of the project which will also focus on securing livelihoods of the people in the region and enhancing enforcement to reduce wildlife crime.

The project has been launched in association with United Nations Development Program.

Q.115) National Mission on sustainable habitat is one of the missions under National Action plan on Climate Change (NAPCC). Which of the following statements is/are NOT correct regarding National Mission on Sustainable Habitat?

1. The aim of the mission is to protect the natural habitats of Critically endangered species in India and increase their population.
2. The mission is being implemented by Ministry of Environment, Forest and Climate Change.

Select the code from following:

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

Q.115) Solution (c)

Note: Incorrect options have been asked.

National mission on sustainable habitat

It is one of the eight missions under national climate change action plan and aims to make cities sustainable through improvements in energy efficiency in buildings, management of solid waste & shift to public transport.

The National Mission for Sustainable Habitat which is a component of the National Action Plan for Climate Change will broadly cover the following aspects:

- Extension of the energy conservation building code - which addresses the design of new and large commercial buildings to optimize their energy demand;
- Better urban planning and modal shift to public transport - make long term transport plans to facilitate the growth of medium and small cities in such a way that ensures efficient and convenient public transport;
- Recycling of material and urban waste management - a special areas of focus will be development of technology for producing power form waste.

The National Mission will include a major R&D programme, focusing on bio-chemical conversion, waste water use, sewage utilization and recycling options wherever possible.

Q.116) The rate of biomass production in an ecosystem is called Productivity. Which of the following statements is/are correct regarding different Primary Productivities?

1. Gross primary productivity (GPP) of an ecosystem is the rate of production of organic matter during photosynthesis.
2. Gross primary productivity minus respiration losses, is the net primary productivity (NPP).

Select the code from following:

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

Q.116) Solution (c)

Primary production

Primary production is defined as the amount of biomass or organic matter produced per unit area over a time period by plants during photosynthesis. It is expressed in terms of weight (g–2) or energy (kcal m–2). The rate of biomass production is called productivity.

It can be divided into gross primary productivity (GPP) and net primary productivity (NPP).

Gross primary productivity of an ecosystem is the rate of production of organic matter during photosynthesis. A considerable amount of GPP is utilised by plants in respiration. Gross primary productivity minus respiration losses (R) is the **net primary productivity** (NPP).

GPP – R = NPP

Net primary productivity is the available biomass for the consumption to heterotrophs (herbiviores and decomposers).

Secondary productivity is defined as the rate of formation of new organic matter by consumers.

Q.117) Which of the following statements correctly explains the term 'Saprotroph'?

a) This is the name given to the organisms which produce their own food without sunlight.
b) It is an organism which feeds on decaying organic matter.
c) This is the name given to highest consumer in a food chain.
d) It is a primary food producer in marine food chain.

Q.117) Solution (b)

Saprotrophs

The detritus food chain (DFC) begins with dead organic matter. It is made up of decomposers which are heterotrophic organisms, mainly fungi and bacteria. They meet their energy and nutrient requirements by degrading dead organic matter or detritus. These are also known as **saprotrophs** (sapro: to decompose). Decomposers secrete digestive enzymes that breakdown dead and waste materials into simple, inorganic materials, which are subsequently absorbed by them.

Q.118) Which of the following statements correctly explains the 10 per cent law in context of ecology?

a) Only 10 per cent of the energy is transferred to each trophic level from the lower trophic level.
b) Biomass in one tropic level is only 10% of the lower trophic level.
c) With 10 per cent increase in sunlight the vegetation growth in an ecosystem gets doubled.
d) None of the above

Q.118) Solution (a)

Ten Percent Law

The Ten **percent law** of transfer of energy from one trophic level to the next was introduced by Raymond Lindeman (1942). According to this **law**, during the transfer of energy from organic food from one trophic level to the next, only about ten **percent** of the energy from organic matter is stored as flesh.

Q.119) The gradual and fairly predictable change in the species composition of a given area is called ecological succession.Which of the following statements regarding Ecological succession is/are correct?

1. Hydrarch succession takes place in wetter areas and the successional series progress from hydric to the mesic conditions.
2. Xerarch succession takes place in dry areas and the series progress from dry to mesic conditions.

Select the code from following:

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

Q.119) Solution (c)

Based on the nature of the habitat – whether it is water (or very wet areas) or it is on very dry areas – succession of plants is called hydrach or xerarch, respectively.

Hydrarch succession takes place in wetter areas and the successional series progress from hydric to the mesic conditions. As against this, xerarch succession takes place in dry areas and the series progress from xeric to mesic conditions. Hence, both hydrarch and xerach successions lead to medium water conditions (mesic) – neither too dry (xeric) nor too wet (hydric).

Think

- Pioneer species
- Climax species
- Seral stages

Q.120) Consider the following statements with reference to Wetlands:

1. Wetlands exist in every country and in every climatic zone, from the polar regions to the tropics, from high altitudes to dry regions.
2. Mangroves, peat lands, rice fields and even coral reefs can be considered a wetland.

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.120) Solution (c)

According to standard definition, "Wetlands occur where water meets land. They include mangroves, peatlands and marshes, rivers and lakes, deltas, floodplains and flooded forests, rice-fields, and even coral reefs. Wetlands exist in every country and in every climatic zone, from the polar regions to the tropics, from high altitudes to dry regions."

Q.121) Which among the following are likely to increase after large areas of tropical rain forests are cut down?

1. erosion by rivers flowing through the areas
2. rate of nutrient loss from the areas
3. species diversity of the areas
4. average surface temperature of the soil in the areas

Select the correct code:

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

Q.121) Solution (b)

If large areas of tropical rain forests are cut down, it is likely to increase the rate of nutrient loss from the areas; increase the average surface temperature of the soil in the areas and also there will be increase in soil erosion.

However, the continuing loss of the diverse habitats found in tropical rain forests will cause a decrease in species diversity, not an increase. Hence, option (b) is correct answer.

Q.122) Consider the below characteristics:

1. Cold regions with high rainfall, strong seasonal climates with long winters and short summers.
2. Soils are characterized by thin podozols, are acidic and are mineral deficient.
3. The productivity and community stability of these forests are lower than those of any other forest ecosystem.

Identify the appropriate forest ecosystem which has above characteristics:

a) Tundra forest
b) Temperate forest
c) Mediterranean forest
d) Boreal forest

Q.122) Solution (d)

Coniferous forest (boreal forest):

- Cold regions with high rainfall, strong seasonal climates with long winters and short summers
- Evergreen plant species such as Spruce, fir and pine trees, etc and by animals such as the lynx, wolf, bear, red fox, porcupine, squirrel, and amphibians like Hyla, Rana, etc.
- Boreal forest soils are characterized by thin podozols and are rather poor. Both because, the weathering of rocks proceeds slowly in cold environments and because the litter derived from conifer needle (leaf is decomposed very slowly and is not rich in nutrients.)
- These soils are acidic and are mineral deficient.
- This is due to movement of large amount of water through the soil, without a significant counter-upward movement of evaporation, essential soluble nutrients like calcium, nitrogen and potassium which are leached sometimes beyond the reach of roots. This process leaves no alkaline oriented cations to encounter the organic acids of the accumulating litter.
- The productivity and community stability of a boreal forest are lower than those of any other forest ecosystem.

Q.123) Tropical areas have very rich biodiversity as compared to Temperate, because -

1. Over geological times the tropics have had more stable climate than the temperate zones.
2. Of warm temperatures and high humidity in most tropical areas
3. Tropical communities are older than temperate ones
4. Of greater pressure from pests, parasites and diseases in tropics

Which of the statements given above is/are correct reasons for the same?

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

Q.123) Solution (d)

Reasons why biodiversity is rich in Tropics:

1. Over geological times the tropics have had more stable climate than the temperate zones. In tropics, therefore, local species continued to live there itself, whereas in temperate they tend to disperse to other areas.
2. Tropical communities are older than temperate ones and therefore there has been more time for them to evolve. This could have allowed them greater degree of specialization and local adaptation to occur.
3. Warm temperatures and high humidity in most tropical areas provide favourable conditions for many species that are unable to survive in temperate areas.
4. In tropics there is greater pressure from pests, parasites and diseases. This does not allow any single species to dominate and thus there is opportunity for many species to co-exist. On the contrary in temperate zones there is reduced pests pressure due to cold, and there is one or few dominating species that exclude many other species.
5. Among plant, rates of out-crossing appear to be higher in tropics, which may lead to higher levels of genetic variability.
6. Tropical areas receive more solar energy over the year. Thus tropical communities are more productive or greater resource base that can support a wider range of species.

Q.124) Select the correct term related to the phrase - "The entire complement of species of organisms, plants and animals found within a given region"

a) Community
b) Biotype
c) Biota
d) Biome

Q.124) Solution (c)

Biome: A large terrestrial ecosystem characterized by specific plant communities and formations; usually named after the predominant vegetation in the region.

Biosphere: The totality of life on or near Earth's surface.

Biota: The entire complement of species of organisms, plants, and animals, found within a given region.

Biotype: A biotope is an area of uniform environmental conditions providing a living place for a specific assemblage of plants and animals. Biotope is almost synonymous with the term habitat.

In ecology, a community is an assemblage or association of populations of two or more different species occupying the same geographical area and in a particular time, also known as a **biocoenosis**.

Q.125) In the context of solving pollution problems, what is/are the advantage(s) of bioremediation technique?

1. It is a technique for cleaning up pollution by enhancing the same biodegradation process that occurs in nature.
2. Any contaminant with heavy metals such as cadmium and lead can be readily and completely treated by bioremediation using microorganisms.
3. Genetic engineering can be used to create microorganisms specifically designed for bioremediation.

Select the correct answer using the correct codes given below:

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

Q.125) Solution (c)

Bioremediation is the use of microorganisms (bacteria and fungi) to degrade the environmental contaminants into less toxic forms.

Statement 1:

- In-situ Bioremediation techniques: It involves treatment of the contaminated material at the site. Such as: Bioventing; Biosparging; Bioaugmentation
- Ex-situ Bioremediation techniques: It involves removal of the contaminated material to be treated elsewhere. Such as: Landfarming; Biopiles; Bioreactors; Composting.

Statement 2:

- Disadvantage of bioremediation is that it is limited to those compounds that are biodegradable.
- Not all compounds are susceptible to rapid and complete degradation.

Statement 3:

- Genetic engineering is also one of the approaches under which Phytoremediation that is using of plants to remove contaminants from soil and water.

Q.126) The miniature succession of micro-organic environment and different types of fungi on the fallen logs of the decaying wood, tree bark, etc. is called:

a) Sere
b) Mesarch
c) Serule
d) Pioneers

Q.126) Solution (c)

Pioneers: The first organisms to become established in an ecosystem undergoing succession are called pioneers; the stable community that ends the succession is termed the climax community.

Sere: The whole series of communities which are involved in the ecological succession at a given area. For example, from grass to shrub to forest, and which terminates in a final stable climax community, is called as sere.

Mesarch: The succession when begins in an area, where adequate moisture is present, is called mesarch.

Xerach: The succession when starts in xeric or dry habitat having minimum amounts of moisture, such as dry deserts, rocks, etc. is called xerach.

Serule: The miniature succession of micro-organic environment and different types of fungi on the fallen logs of the decaying wood, tree bark, etc. is called serule.

Q.127) Consider the following statements with reference to a National Park:

1. It has moist deciduous, semi evergreen, evergreen, shola forests and montane grasslands.
2. It is home to largest population of Lion Tailed Macaque.
3. It is locally known as Sairandhrivanam.

Which of the following National Parks is characterized by the above features?

a) Manas
b) Bannerghata
c) Silent valley
d) Nandadevi

Q.127) Solution (c)

Silent Valley National Park has exceptional Ecosystem diversity from moist deciduous, semi evergreen, evergreen and shola forests to montane grasslands. It has largest population of Lion Tailed Macaque and Nilgiri Langur. It comes under Project Elephant area.

The Silent Valley region is locally known as Sairandhrivanam, which means Sairandhri's Forest. Sairandhri is Draupadi, the wife of the Pandavas in the epic Mahabharatha, who disguised herself as Sairandhri, the maid of a queen named Sudeshna while her family was in exile

Manas national park is ruled out as Shola forests are endemic to southern part of Western Ghats.

Bannerghata national park is located just south of Bengaluru and is deprived of shola forest.

Lion tailed macaque is not there in Nandadevi national park.

Do you know?

- The Eastern Highlands moist deciduous forests is a tropical moist broadleaf forest ecoregion of east-central India. The ecoregion covers an area of 341,100 square kilometers (131,700 sq mi), extending across portions of Andhra Pradesh, Chhattisgarh, Jharkhand, Madhya Pradesh, Maharashtra, Odisha, and Telangana states.

THINK!

- Simlipal National Park

Q.128) Consider the following statements regarding Loktak lake:

1. It is known for phumdis floating over it.
2. It provides habitat to critically endangered Sangai.
3. It is covered under Ramsar list and Montruex Record.
4. Keoladeo National Park is situated inside the lake.

Which of the statements given above is/are correct?

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

Q.128) Solution (d)

Loktak Lake is the largest freshwater lake in North -East India (Manipur) is famous for the phumdis (heterogeneous mass of vegetation, soil, and organic matters at various stages of decomposition) floating over it.

It is listed under Ramsar as well as Montreux Record.

The Keibul Lamjao National Park on the lake is the only remaining natural habitat of the endangered brow-antlered deer or the dancing deer, locally known as Sangai. Keibul Lamjao National park is situated inside the lake to conserve the species.

Do you know?

- Keoladeo National Park or Keoladeo Ghana National Park formerly known as the Bharatpur Bird Sanctuary in Bharatpur, Rajasthan, India is a famous avifauna sanctuary that hosts thousands of birds, especially during the winter season. Over 230 species of birds are known to be resident. It is also a major tourist centre with scores of ornithologists arriving here in the hibernal season. It was declared a protected sanctuary in 1971. It is also a World Heritage Site.

THINK!

- Tso Moriri Lake

Q.129) Consider the following statements regarding Biosphere Reserves:

1. The core area should be large enough to sustain viable population of all trophic levels.
2. There is no comprehensive statute covering biosphere reserves in India.
3. All biosphere reserves of India are under the MAB programme of UNESCO.

Which of the statements given above is/are correct?

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

Q.129) Solution (b)

Biosphere Reserves (BRs) are representative parts of natural and cultural landscapes extending over large area of terrestrial or coastal/marine ecosystems or a combination thereof and representative examples of bio-geographic zones/provinces.

The core area of biosphere reserve should be typical of a bio-geographical unit and large enough to sustain viable populations representing all trophic levels in the ecosystem.

The UNESCO has introduced the designation 'Biosphere Reserve' for natural areas to minimize conflict between development and conservation. BRs are nominated by national government which meet a minimal set of criteria and adhere to minimal set of conditions for inclusion in the world network of Biosphere reserves under the Man and Biosphere Reserve Programme of UNESCO. **Thus only 10 of the 18 biosphere reserves are covered under MAB.**

At present, there is no comprehensive legislation dealing with all aspect of biosphere. Only few aspects have legal backing e.g. the core areas like National park or wildlife sanctuaries of reserve are governed under Wildlife protection act.

Do you know?

- The United Nations General Assembly declared 2011–20 the United Nations Decade on Biodiversity (Resolution 65/161). The UN Decade on Biodiversity serves to support and promote implementation of the objectives of the **Strategic Plan for Biodiversity and the Aichi Biodiversity Targets, with the goal of significantly reducing biodiversity loss.**

THINK!

- Cartagena Protocol on Biosafety.

Q.130) With reference to biodiversity conservation, Forest PLUS is:

a) a bilateral program between India and Nepal to enhance conservation efforts for the forests in the Himalayas.
b) a bilateral program between India and the U.S. to develop solutions for sustainable forest land use in India.
c) a program of UNFCCC to reduce emissions from deforestation and forest degradation.
d) None of the above.

Q.130) Solution (b)

Forest-PLUS is a bilateral program between India and the U.S. to develop solutions for sustainable forest land use in India. The program, in partnership with the Ministry of Environment, Forest and Climate Change (MoEFCC), prepares India to implement successfully Reducing Emissions from Deforestation and Forest Degradation (REDD+), an international mechanism for climate change mitigation, livelihoods improvement, and biodiversity protection.

Do you know?

- Dr Harsh Vardhan inaugurates Conference on "Sustainable Landscapes & Forest Ecosystems: Theory to Practice" Environment Minister launches "Wood is Good" Campaign on 12-September-2017.

THINK!

- REDD

(Source http://pib.nic.in/newsite/PrintRelease.aspx?relid=170685)

Q.131) Insectivorous plants have special mechanisms that trap insects which serve as their nutrition. With respect to this, which of the following conditions is/are favorable for this modification?

1. Acidic soils
2. Nitrogen deficient soils.
3. Leached soils.

Select the correct answer using the code given below.

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

Q.131) Solution (d)

Insectivorous plants are a specialized group of plants that grow **in wet, acidic soils.**

One of the most critical plant nutrients is nitrogen which is usually taken up by plants as nitrates. **Nitrogen is a nutrient that is easily leached out of soils.**

For this reason, the plants that live in these soils have evolved into carnivorous plants that capture and digest insects as a means of obtaining nitrates. **These plants are usually associated with leached, nutrient-poor soils, or wet and acidic areas that are ill-drained.**

Do you know?

Insectivorous plants of India belong mainly to three families:

- Droseraceae
- Nepenthaceae
- Lentibulariaceae

THINK!

- Endangered plants from India.

Q.132) Biosphere reserves are demarcated into following 3 inter-related zones-Core zones, Buffer Zones and Transition Zone. A core zone being National Park or Sanctuary is regulated under which of the following acts?

a) Environmental Protection Act, 1986
b) Wildlife Protection Act, 1972
c) Biodiversity Act, 2002
d) The Forest (Conservation) Act, 1980

Q.132) Solution (b)

Biosphere reserves are demarcated into following 3 inter-related zones:

Core Zone: Core zone must contain suitable habitat for numerous plant and animal species, including higher order predators and may contain centres of endemism. Core areas often conserve the wild relatives of economic species and also represent important genetic reservoirs having exceptional scientific interest.

A core zone being National Park or Sanctuary regulated under the Wildlife (Protection) Act, 1972. Whilst realizing that perturbation is an ingredient of ecosystem functioning, the core zone is to be kept free from l human pressures external to the system.

Buffer Zone: The buffer zone, adjoins or surrounds core zone, uses and activities are managed in this area in the ways that help in protection of core zone in its natural condition. These uses and activities include restoration, demonstration sites for enhancing value addition to the resources, limited recreation, tourism, fishing, grazing, etc; which are permitted to reduce its effect on core zone. Research and educational activities are to be encouraged. Human activities, if natural within BR, are likely to continue if these do not adversely affect the ecological diversity.

Transition Zone: The transition area is the outermost part of a biosphere reserve. This is usually not delimited one and is a zone of cooperation where conservation knowledge and management skills are applied and uses are managed in harmony with the purpose of the biosphere reserve. This includes settlements, crop lands, managed forests and area for intensive recreation and other economic uses characteristics of the region.

Do you know?

Benefit sharing out of usage of biological resources can be done in following manner

- Joint ownership of intellectual property rights
- transfer of technology
- location of production, research development units in the area of source
- payment of monetary and non-monetary compensation
- setting up of venture capital fund for aiding the cause of benefit claimers

THINK!

- Traditional Knowledge Digital Library (TKDL)

Q.133) Consider the following statements regarding Community Reserves:

1. Its objective is to protect the areas in and around existing or proposed protected areas from private ownership of land and land use.
2. They are declared under Wildlife Protection Act, 1972.
3. It is managed by a Community Reserve Management Committee.

Which of the statements given above is/are correct?

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

Q.133) Solution (d)

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 community areas if they are uninhabited and owned by both govt. and private individuals but used for subsistence by communities. If such land is completely owned by government of India it is called as conservation areas.

These protected area categories were first introduced in the Wildlife (Protection) Amendment Act of 2002, the amendment to the Wildlife Protection Act of 1972. Under the act, Community Reserve Management committee is formed to manage the community reserves. Their members would be included from Gram sabha.

These categories were added because of reduced protection in and around existing or proposed protected areas due to private ownership of land, and land use. The declaration of such an area is aimed at improving the socio-economic conditions of the people living in such areas as well as conserving wildlife.

The law calls for a 'Community Reserve Management Committee' (CRMC), the 'competent authority to prepare and implement management plans for the Reserve and to take steps to ensure the protection of the wildlife and its habitat in the Reserve'. Its representatives will be nominated from the local village panchayat or gram sabha.

Do you know?

- Tiruppadaimarathur Conservation Reserve is an IUCN Category V protected bird nesting area in the 2.84 hectares (7.0 acres) compound of Siva temple in Tiruppadaimarathur village, Thanjavur District, Tamil Nadu, South India. It was declared Feb 14, 2005 and **is the first Conservation Reserve to be established in India.** The reserve is 10 kilometres (6.2 mi) from Kalakkad Mundanthurai Tiger Reserve.

THINK!

- Indian Council of Forestry Research and Education.

Q.134) Project Elephant was launched by Government of India in 1992. Which of the following statements are correct regarding Project Elephant?

1. It aims at conserving elephants, their habitat and migratory routes.
2. Project includes only wild elephants and not domestic elephants.
3. The project's endeavour is to strengthen the measures for protection of elephants against poachers and unnatural death.

Select the code from following:

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

Q.134) Solution (c)

Project Elephant

Initiated in 1992 by the Government of India Project Elephant aims at conserving elephants and their habitat and of migratory routes by developing scientific and planned management measures. Under the project welfare of the domestic elephants is also considered, issues like mitigation of human-elephant conflict are also taken care of. The project's endeavour is to strengthen the measures for protection of elephants against poachers and unnatural death.

Q.135) Which of the following species is not critically endangered?

a) Malabar Civet
b) Hangul
c) Pygmy Hog
d) Blackbuck

Q.135) Solution (d)

According to IUCN status, Blackbuck is least concerned specie. However, it is in Schedule I of Wildlife protection act because of its cultural and religious significance.

Q.136) The Svalbard Global Seed Vault is a secure seed bank which act as a bank for seed banks of other countries. Where is it located?

a) Denmark
b) Norway
c) Netherlands
d) Finland

Q.136) Solution (b)

Svalbard Global Seed Vault

The Svalbard Global Seed Vault is a secure seed bank on the Norwegian island of Spitsbergen near Longyearbyen in the remote Arctic Svalbard archipelago, about 1,300 kilometres (810 mi) from the North Pole.

The seed vault is an attempt to ensure against the loss of seeds in other genebanks during large-scale regional or global crises. The seed vault is managed under terms spelled out in a tripartite agreement between the Norwegian government, the Crop Trust and the Nordic Genetic Resource Center (NordGen).

The Norwegian government entirely funded the vault's approximately 45 million kr (US$8.8 million in 2008) construction. Storing seeds in the vault is free to end users, with Norway and the Crop Trust paying for operational costs. Primary funding for the Trust comes from organisations such as the Bill & Melinda Gates Foundation and from various governments worldwide.

Q.137) The High Biodiversity Wilderness Areas (HBWA) approach has been developed by Conservation International (CI). HBWAs consist of 5 of the 24 major wilderness areas that hold globally significant levels of biodiversity. Which of the following areas are considered under HBWA?

1. Amazonia
2. The Congo forests of Central Africa
3. New Guinea
4. The North American Desert complex

Select the code from following:

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

Q.137) Solution (d)

High Biodiversity Wilderness Areas (HBWA)

The High Biodiversity Wilderness Areas (HBWA) approach has been developed by Conservation International (CI). HBWAs consist of 5 of the 24 major wilderness areas that hold globally significant levels of biodiversity, as identified by Mittermeier et al (2002). **The 5 HBWAs are Amazonia, the Congo forests of Central Africa, New Guinea, the Miombo-Mopane woodlands of Southern Africa (including the Okavango Delta), and the North American desert complex of northern Mexico and the Southwestern part of United States of America.** The intact portion of these areas covers 8,981,000 km^2 (76% of their original extent), and 6.1% of the planet's land area. The geographic boundaries of the HBWAs coincide with the boundaries of several amalgamated WWF ecoregions.

In the past HBWAs were mostly considered to have "low vulnerability" because of their low levels of past habitat loss. However, recent analysis suggests that the high cultivation potential of many HBWAs makes them a target for future agricultural expansion. Cropland expansion is one of the primary threats to biodiversity in tropical countries.

Q.138) In order to name a biodiversity hotspot, which of the following criteria is not taken into account?

a) Endemism
b) Biodiversity loss
c) Lesser inter – species competition
d) Species richness

Q.138) Solution (c)

Biodiversity Hotspot

To qualify as a biodiversity hotspot, a region must meet two strict criteria:

- It must have at least **1,500 vascular plants as endemics** — which is to say, it must have a high percentage of plant life found nowhere else on the planet. A hotspot, in other words, is **irreplaceable.**
- It must have **30% or less of its original natural vegetation.** In other words, it must be **threatened.**

Around the world, **35 areas** qualify as hotspots. They represent just **2.3% of Earth's land surface,** but they support more than half of the world's plant species as endemics — i.e., species found no place else — and nearly **43% of bird, mammal, reptile and amphibian species as endemics.**

Q.139) In general the biodiversity

a) Increases towards equator
b) Decreases towards equator
c) Is zero in arctic region
d) Is not effected by latitudes

Q.139) Solution (a)

Conducive conditions for biodiversity are high temperature, ample sunlight and moisture. Since all these conditions are present at the equator, it has high biodiversity.

Q.140) Which of the following endangered animals are correctly matched with the National Parks?

1. Hangul – Kebul lamjao
2. Tiger – Bandipur
3. Elephant – Periyar
4. Rhinoceros – Kaziranga

Select the code from following:

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

Q.140) Solution (b)

Hangul is Kashmir Stag. It is found only in Dachigam National Park.

Q.141) Consider the below statements with regard to Under2 Coalition and identify the correct statement:

a) It is a group of ambitious governments from around the world committed to combating climate change.
b) It is in relation to limiting the use of plastic which are above 2 microns.
c) It is in relation to limiting the use of plastic and plan policy on alternatives.
d) It deals with conservation of Antarctica and Antarctic

Q.141) Solution (a)

Pic link: http://under2mou.org/wp-content/uploads/2016/08/Under2-Secretariat-Logo.jpg

The Under2 Coalition is a group of ambitious governments from around the world committed to combating climate change. A total of 205 jurisdictions representing 43 countries and six continents have signed or endorsed the climate agreement, known as the Under2 MOU (Memorandum of Understanding).

The goal of limiting warming to below 2° Celsius, which the Intergovernmental Panel on Climate Change (IPCC) scientists say is needed to avoid dangerous consequences.

The Under2 Coalition's shared goal of limiting greenhouse gas emissions to 2 tons per capita, or 80-95% below 1990 level by 2050.

Q.142) Which of the following statements regarding Marsupial mammals are correct?

1. Marsupial females have a pouch to carry and protect their babies.
2. The young ones are born premature and the embryo climbs from the mother's birth canal to the nipple.
3. They have a longer gestation period as compared to placental mammal of the same size.

Select the code from below:

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

Q.142) Solution (a)

Marsupials are any members of the mammalian infraclass Marsupialia. All extant marsupials are endemic to Australasia and the Americas. A distinctive characteristic common to these species is that most of the young are carried in a pouch. Well-known marsupials include

kangaroos, wallabies, koalas, possums, opossums, wombats, and Tasmanian devils. Some lesser known marsupials are the potoroo and the quokka.

Marsupials represent the clad originating from the last common ancestor of extant metatherians. Like other mammals in the Metatheria, they give birth to relatively undeveloped young that often reside with the mother in a pouch, for a certain amount of time. Close to 70% of the 334 extant species occur on the Australian continent (the mainland, Tasmania, New Guinea and nearby islands).

Marsupials give birth at a very early stage of development (about four to five weeks); after birth, newborn marsupials crawl up the bodies of their mothers and attach themselves to a nipple, which is located on the underside of the mother either inside a pouch called the marsupium or open to the environment. To crawl to the nipple and attach to it, the marsupial must have well-developed forelimbs and facial structures. This is accomplished by accelerating forelimb and facial development in marsupials compared to placental mammals, which results in decelerated development of such structures as the hindlimb and brain. There they remain for a number of weeks, attached to the nipple. The offspring are eventually able to leave the marsupium for short periods, returning to it for warmth, protection, and nourishment.

Q.143) Consider the below statements in regard to SAMPADA scheme and indentify the correct statement:

a) It is launched by ministry of culture to preserve ancient literary pieces and manuscripts
b) It is a scheme of Ministry of Drinking Water and Sanitation to improve access to drinking water in drought hit areas
c) It is a scheme of Ministry of agriculture to boost farm income
d) It is a scheme of Ministry of Food processing to modernise agriculture, processing and decrease agri-waste

Q.143) Solution (d)

The government has given its approval for re-structuring the schemes of the Ministry of Food Processing Industries (MoFPI) under new Central Sector Scheme – SAMPADA (Scheme for Agro-Marine Processing and Development of Agro-Processing Clusters) for the period 2016-20. The objective of SAMPADA is to supplement agriculture, modernize processing and decrease agri-waste.

SAMPADA is an umbrella scheme incorporating ongoing schemes of the Ministry like Mega Food Parks, Integrated Cold Chain and Value Addition Infrastructure, Food Safety and Quality Assurance Infrastructure, etc. It now also includes new schemes of Infrastructure for Agro-processing Clusters, Creation of Backward and Forward Linkages and Creation / Expansion of Food Processing & Preservation Capacities. The implementation of SAMPADA will result in creation of modern infrastructure with efficient supply chain management from farm gate to retail outlet.

Q.144) Which of the following statements are correct about endosulfan?

1. Endosulfan is acutely neurotoxic to both insects and mammals.
2. Endosulfan has high potential to bio-accumulate and bio-magnify.
3. Endosulfan is banned across the world under Stockholm convention.
4. Endosulfan is the cause of death of Indian vultures.

Select the code from the following:

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

Q.144) Solution (b)

The Stockholm Convention banned endosulfan in more than 120 countries in 2011, including India.

The World Health Organization classifies pesticides based on their acute toxicity. Class I pesticides are considered to be the most hazardous. Many class I pesticides such as monocrotophos, triazophos and phosphamidon are still in use in India, even though they are banned by other countries.

In 2011, India's supreme court banned endosulfan after aerial spraying was linked to neurological and congenital disorders in children in southern India. The decision came hot on the heels of the Stockholm Convention meeting in Geneva, where India agreed to join a global phase-out of the pesticide.

Cause of death of Indian vultures is the use of diclofinac, not endosulfan.

Q.145) Which of the following are classified as 'Lotic Ecosystem'?

1. Brooks
2. Springs
3. Lakes
4. Rivers

Select the correct code

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

Q.145) Solution (b)

A Lotic Ecosystem has flowing waters. Examples include: creeks, streams, runs, rivers, springs, brooks and channels.

A Lentic Ecosystem has still waters. Examples include: ponds, basin marshes, ditches, reservoirs, seeps, lakes, and vernal / ephemeral pools.

Q.146) Consider the following statements regarding the 'Black Lung' Disease:

1. It is an industrial hazard of mercury mining and develops due to inhaling of mercury vapours.
2. It is a form of Pneumoconiosis.

Which of the above statements are correct?

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

Q.146) Solution (b)

The other name for 'Black Lung Disease' is Coal Workers Pneumoconiosis (CWP) and is caused by long exposure to coal dust. It is similar to silicosis, from inhaling silica dust, and to the long effects of Tobacco smoking.

Q.147) Choose the Correct Answer

Hydroponics is otherwise called

a) soil-less agriculture
b) tank farming
c) chemical gardening
d) All of the above

Q.147) Solution (d)

Hydroponics: The term hydroponics has been used for growth of plants in water and sand culture. This may also be referred to as soil-less agriculture, test-tube farming, tank farming or chemical gardening.

Q.148) With regard to forest fires in India consider the following statements.

1. Maximum number of forest fires occurs in Open Forest (OF) followed by Moderately Dense Forests (MDF).
2. India don't have a dedicated scheme for Forest fire management and forest fire management is done ad hoc.

Which of the following statements is/are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) None

Q.148) Solution (a)

According to India State of Forest Report (ISFR) maximum number of forest fires occurs in Open Forest (OF) followed by Moderately Dense Forests (MDF). About 70% forest fires in India occur in the tropical dry forests encompassing scrub, savanna grassland, dry and moist-deciduous forests.

Forest Fire Prevention & Management Scheme (FFPMS)

Intensification of Forest Management Scheme was revised and replaced as Forest Fire Prevention & Management Scheme in December 2017.

It's a centrally sponsored scheme with an aim to focus solely on the issue of forest fire prevention & management and related activities, to address growing concern over adverse effects of forest fire.

Funding Pattern:

- For Normal States: 60:40 between center and states.
- NE and Himalayan states: 90:10 between center and states
- For Union Territory: 100% central funding

Do you know?

- Madhya Pradesh has the largest forest cover of 77,414 sq km in the country in terms of area, followed by Arunachal Pradesh with 66,964 sq km and Chhattisgarh (55,547 sq km).
- In terms of percentage of forest cover with respect to the total geographical area, Lakshadweep with (90.33 per cent) has the highest forest cover, followed by Mizoram (86.27 per cent) and Andaman & Nicobar Island (81.73 per cent).

THINK!

- India State of Forest Report 2017

Q.149) Water Scarce Cities Initiative- is an initiative of

a) UNEP
b) World Bank
c) IUCN
d) UNDP

Q.149) Solution (b)

Water Scarce Cities Initiative- World Bank's initiative that offers a holistic perspective to urban water security in scarcity conditions. It is working towards shifting mindsets across the world, demystifying urban water management, and engaging with water scarce cities to develop concrete solutions.

Do you know?

- Recently, a report titled "Water Scarce Cities: Thriving in a Finite World" was released by World Bank Group that attempts to compile innovative approaches from the Water Scarce Cities (WSC) Initiative.

THINK!

- Ancient water conservation systems of India.

(Source http://www.thehindu.com/opinion/op-ed/making-every-drop count/article23311134.ece)

Q.150) Which of the following parties involved in Maharashtra Project for Climate Resilient Agriculture?

1. Government of India
2. Government of Maharashtra
3. World Bank
4. Asian Development Bank

Select the correct answer using the codes given below.

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

Q.150) Solution (c)

Recently, Government of India, Government of Maharashtra and the World Bank signed a US$ 420 million loan for Maharashtra Project for Climate Resilient Agriculture.

The project aims to improve water harvesting structures and adopt Climate Smart Agricultural Practices in the water-starved Vidarbha and Marathwada regions of Maharashtra.

Do you know?

- Food and Agricultural Organization of the United Nations (FAO), which defines Climate Smart Agriculture as "agriculture that sustainably increases productivity, enhances resilience (adaptation), reduces/removes GHGs (mitigation) where possible, and enhances achievement of national food security and development goals".

THINK!

- National Innovations on Climate Resilient Agriculture (NICRA)

(Source http://pib.nic.in/newsite/PrintRelease.aspx?relid=178494)

Q.151) The term `Extended Producer Responsibility' often in news related to

a) Ecosystems services provided by Biodiversity
b) Waste management
c) Marine fishing
d) Mining and Metallurgy

Q.151) Solution (b)

In the field of waste management, extended producer responsibility (EPR) is a strategy designed to promote the integration of environmental costs associated with goods throughout their life cycles into the market price of the products.

Extended producer responsibility legislation is a driving force behind the adoption of remanufacturing initiatives as it "focuses on the end-of-use treatment of consumer products and has the primary aim to increase the amount and degree of product recovery and to minimize the environmental impact of waste materials".

Do you know?

Ministry of Environment, Forest and Climate Change (MoEF&CC) amended the Plastic Waste Management Rules, 2016. Highlights of the New Rule are as follows-

- New Central registration system
- Automated registration
- Plastic waste management fee

THINK!

- Plastic Waste Management Rule 2016

Q.152) Mission ZERO Waste is component of which of the following initiative of Government of India?

a) Swachh Bharat Mission (Urban)
b) Make In India
c) Start Up India
d) Skill India Mission

Q.152) Solution (a)

Under the Swachh Bharat Mission (Urban), Government is approaching, Mission ZERO Waste which aims at sound management of the solid wastes generated in the country with special focus on Reduce, Reuse and Recycle (3Rs). "Mission Zero Waste" complements the Swachh Bharat Mission of Government of India aiming at fostering creativity, innovation, green business, eco-education & consumerism.

Do you know?

- 8th Regional 3R Forum in Asia and Pacific was organized by Ministry of Housing and Urban Affairs, Government of India; Ministry of the Environment of the Environment of the Government of Japan and United Nations Centre for Regional Development (UNCRD).

THINK!

- International Regional Forum on 3Rs

(Source http://india3rforum.in/hi/2-uncategorised/32-about-mission-zero-waste-and-swachh-bharat-mission.html)

Q.153) Global Commission on the Geopolitics of Energy Transformation is launched by

a) International Renewable Energy Agency (IRENA)
b) International Atomic Agency
c) International Energy Forum
d) International Energy Agency

Q.153) Solution (a)

International Renewable Energy Agency (IRENA), launched the Global Commission on the Geopolitics of Energy Transformation.

Global Commission on the Geopolitics of Energy Transformation

- It will work to achieve a better understanding of the geopolitical implications of a large-scale shift to renewable energy.
- It will analyses how higher shares of renewable energy and increased energy efficiency will impact relations between states and thus reshape global energy diplomacy.
- It will suggest how countries can thrive in the new energy economy in line with the Paris Climate Agreement objectives and the SDGs.

Do you know?

International Renewable Energy Agency (IRENA)

- It is an intergovernmental organization that supports countries in their transition to a sustainable energy future.
- It serves as the principal platform for international cooperation, and a repository of policy, technology, resource and financial knowledge on renewable energy.

THINK!

- International Energy Forum

(Source http://www.downtoearth.org.in/news/global-body-comes-into-action-to-map-geopolitical-impact-of-renewables-60251)

Q.154) "Future of Global Energy Security: Transition, Technology, Trade and Investment" is theme of which of the following Summits/Forums?

a) World Economic Forum-2018
b) International Energy Forum-2018
c) International Energy Agency-2018
d) World Entrepreneurial Summit-2017

Q.154) Solution (b)

The 16th International Energy Forum Ministerial (IEF 16) was hosted by India and co-hosted by China and S. Korea.

The IEF is an inter-governmental forum set up in 1991 and is based in Riyadh, Saudi Arabia.

The theme of IEF 16 was "Future of Global Energy Security: Transition, Technology, Trade and Investment".

Do you know?

- Covering all six continents and accounting for around 90% of global supply and demand for oil and gas, the IEF is unique in that it comprises not only consuming and producing countries of the IEA and OPEC, but also Transit States and major players outside of their memberships, including Argentina, China, India, Mexico, Russia and South Africa.

THINK!

- Association of Renewable Energy Agencies of States (AREAS)

(Source http://pib.nic.in/newsite/PrintRelease.aspx?relid=178533

https://mnre.gov.in/association-renewable-energy-agencies-states-areas)

Q.155) Which of the following are the negative environmental impacts of agriculture?

1. Global warming
2. Soil erosion
3. Deforestation
4. Introduction of alien species

Select the code from following:

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

Q.155) Solution (d)

Agriculture has been shown to produce significant effects on climate change, primarily through the production and release of greenhouse gases such as carbon dioxide, methane, and nitrous oxide. In addition, agriculture that practices tillage, fertilization, and pesticide application also releases ammonia, nitrate, phosphorus, and many other pesticides that affect air, water, and soil quality, as well as biodiversity. Agriculture also alters the Earth's land cover, which can change its ability to absorb or reflect heat and light, thus contributing to radiative forcing. Land use change such as deforestation and desertification, together with use of fossil fuels, are the major anthropogenic sources of carbon dioxide; agriculture itself is the major contributor to increasing methane and nitrous oxide concentrations in earth's atmosphere.

Soil degradation is the decline in soil quality that can be a result of many factors, especially from agriculture. Soils hold the majority of the world's biodiversity, and healthy soils are essential for food production and an adequate water supply. Common attributes of soil degradation can be salting, waterlogging, compaction, pesticide contamination, decline in soil structure quality, loss of fertility, changes in soil acidity, alkalinity, salinity, and erosion. Soil erosion is the wearing away of topsoil by water, wind, or farming activities. Topsoil is very fertile, which makes it valuable to farmers growing crops. Soil degradation also has a huge impact on biological degradation, which affects the microbial community of the soil and can alter nutrient cycling, pest and disease control, and chemical transformation properties of the soil.

Genetically modified seeds have been introduced in the ecosystem which have acted as invasive species hampering the biodiversity of the region.

Q.156) Which of the following statements are correct regarding 'Radiative Forcing'?

1. It is the method of artificially trapping more heat from sun.
2. Negative radiative forcing means that Earth loses more energy to space than it receives from the sun.

Select the code from following:

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

Q.156) Solution (b)

Radiative forcing or climate forcing is the difference between insolation (sunlight) absorbed by the Earth and energy radiated back to space. The influences that cause changes to the Earth's climate system altering Earth's radiative equilibrium, forcing temperatures to rise or fall, are called climate Forcings. Positive radiative forcing means Earth receives more incoming energy from sunlight than it radiates to space. This net gain of energy will cause warming. Conversely, negative radiative forcing means that Earth loses more energy to space than it receives from the sun, which produces cooling.

Typically, radiative forcing is quantified at the tropopause or at the top of the atmosphere (often accounting for rapid adjustments in temperature) in units of watts per square meter of the Earth's surface. Positive forcing (incoming energy exceeding outgoing energy) warms the system, while negative forcing (outgoing energy exceeding incoming energy) cools it. Causes of radiative forcing include changes in insolation and the concentrations of radiatively active gases, commonly known as greenhouse gases, and aerosols.

Q.157) Which of the following statements correctly defines contrails?

a) These are enzyme tracks left by blue whales which can help scientists to track their movement.
b) This is a mechanism of counting tigers with unique trail of each tiger.
c) These are line shaped clouds produced by aircraft engine exhaust.
d) These are the smoke trails produced by high chimneys.

Q.157) Solution (c)

Contrails (short for "condensation trails") are line-shaped clouds produced by aircraft engine exhaust or changes in air pressure, typically at aircraft cruise altitudes several miles above the Earth's surface. Contrails are composed primarily of water, in the form of ice crystals. The combination of water vapor in aircraft engine exhaust and the low ambient temperatures that exist at high altitudes allows the formation of the trails. Impurities in the engine exhaust from the fuel, including sulfur compounds (0.05% by weight in jet fuel) provide some of the particles that can serve as sites for water droplet growth in the exhaust and, if water droplets form, they might freeze to form ice particles that compose a contrail.

Q.158) Overfishing has become one of the major disasters affecting the biodiversity of the ocean. Which of the following statements correctly explains the process of 'Bycatch'?

a) Extra fishes caught by fishermen to avoid going for fishing again and again.
b) It is the term given to catching of large fishes like sharks.
c) It is the term given to failed fishing attempt because of lack of fishes.
d) It is the term given to fish or other marine organisms that is caught unintentionally while catching the target specie.

Q.158) Solution (d)

Bycatch, in the fishing industry, is a fish or other marine species that is caught unintentionally while catching certain target species and target sizes of fish, crabs etc. Bycatch is either of a different species, the wrong sex, or is undersized or juvenile individuals of the target species. The term "bycatch" is also sometimes used for untargeted catch in other forms of animal harvesting or collecting.

In 1997, the Organisation for Economic Co-operation and Development (OECD) defined bycatch as "total fishing mortality, excluding that accounted directly by the retained catch of target species". Bycatch contributes to fishery decline and is a mechanism of overfishing for unintentional catch.

Q.159) Which of the statements correctly explains 'Visual Pollution'?

a) It is the presence of extra artificial light at night.
b) It is the increase of dust and smoke in the atmosphere causing haziness.
c) It is an aesthetic issue and refers to the impacts of pollution that impair one's ability to enjoy a vista or view.
d) None of the above

Q.159) Solution (c)

Visual pollution is an aesthetic issue and refers to the impacts of pollution that impair one's ability to enjoy a vista or view.

Visual pollution disturbs the visual areas of people by creating harmful changes in the natural environment. Billboards open storage of trash, antennas, electric wires, buildings, and automobiles are often considered visual pollution. An overcrowding of an area causes visual pollution. Visual pollution is defined as the whole of irregular formations, which are mostly found in natural.

Effects of exposure to visual pollution include: distraction, eye fatigue, decreases in opinion diversity, and loss of identity.

Q.160) Tar ball has become a major environmental issue. Which of the following statements are correct regarding Tarball?

a) These are chunks of oil slicks floating on shipping route.
b) It is the name given to oil lumps found trapped in coral reefs.
c) This is the name given to solidified crude oil which jams the pipeline and decreases efficiency.
d) These are lumps of solidified crude oil found usually on the shores.

Q.160) Solution (d)

They are the remnants of crude oil dumped into the ocean by marine vessels or, in this case, by a blown-out undersea well. They are "little, dark-colored pieces of oil that stick to our feet when we go to the beach.

During the initial stages of a spill, the oil will spread into a thin slick, leaving it susceptible to tearing by wind and wave action. The smaller patches that result often disperse over a wide area and some of the crude mixes with water to form an emulsion that looks like chocolate pudding.

This mix is thicker and stickier than the original oil in the spill, but it can still be torn by wind and waves. The smaller pieces it breaks into are tar balls.

Q.161) Pantanal is the World's Largest Wetland System. It is found in

a) China
b) Brazil
c) Russia
d) Venezuela

Q.161) Solution (b)

The world's largest wetland is the Pantanal, which covers 200,000 square kilometres (during the wet season) through Brazil, Paraguay and Bolivia, although 80% of it is in Brazil.

It is a land of flooded grasslands, savannas and tropical forests.

Q.162) 'Adopt a Heritage' Project was recently in news. This project is a key initiative of –

a) Minister of Agriculture and Farmers' Welfare
b) Ministry of Environment, Forest and Climate Change
c) Ministry of Tourism
d) Ministry of Road Transport and Highways

Q.162) Solution (c)

Ministry of Tourism in close collaboration with Ministry of Culture and Archaeological Survey of India (ASI) had launched Adopt a Heritage Project. Under it, selected public sector companies, private sector companies and individuals will develop tourist amenities at heritage sites.

Adopt a Heritage Project

Objectives

- Provide world class tourist facilities at various natural and cultural heritage sites, monuments and other tourist sites.
- Make these selected sites tourist friendly, enhance their tourist potential and cultural importance in planned and phased manner across the country.

Q.163) Headquarters Agreement which was recently approved will institutionalize the functional arrangements between –

a) India and International Solar Alliance (ISA)
b) India and UNFCCC
c) India and UN Clean Seas
d) India and World Meteorological Organization

Q.163) Solution (a)

The International Solar Alliance (ISA) and the Ministry of External Affairs (MEA) have signed the Host Country Agreement, also called as Headquarters Agreement.

- The Agreement will give ISA a juridical personality and gives it power to contract, to acquire and dispose off movable and immovable properties, to institute and defend legal proceedings.

- Under this agreement, ISA shall enjoy such privileges, applicable tax concessions and immunities as are necessary for ISA's Headquarter to independently discharge its function and programmes.

Q.164) Consider the below statements with regard to Swachh Survekshan 2018':

1. Swachh Survekshan survey is released by Ministry of Health and Family Welfare.
2. Mysuru has been ranked the best city in solid waste management.
3. Indore gets cleanest city tag; followed by Madhya Pradesh capital Bhopal, while Union Territory of Chandigarh stands at the third place.

Which of the following statements is/are correct?

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

Q.164) Solution (a)

Swachh Survekshan survey is released by Ministry of Housing and Urban Affairs

State-wise: **Jharkhand** emerges as best performing State. **Maharashtra** stood second, while **Chhattisgarh** was at the third position in the category of 'best-performing States'.

City-wise: **Indore** gets cleanest city tag; followed by Madhya Pradesh capital **Bhopal**, while Union Territory of **Chandigarh** stands at the third place

Mysuru has been ranked the cleanest medium-sized city in the country. Mysuru has been ranked the cleanest among cities with a population of between 3 lakh and one million.

Mangaluru has been ranked the best city in solid waste management.

'Swachh Survekshan 2018' Rankings:

State-wise Ranks	City-wise Ranks
Jharkhand	Indore
Maharashtra	Bhopal
Chhattisgarh	Chandigarh

Q.165) Jatayu Conservation Breeding Centre (JCBC) is part of –

a) Telangana's vulture conservation programme
b) Haryana's vulture conservation programme
c) Maharashtra's vulture conservation programme
d) Madhya Pradesh's vulture conservation programme

Q.165) Solution (b)

Vulture Conservation

In news:

- **Palarapu cliff vulture habitat** in **Telangana**.
- Forest Department officials from Palarapu cliff vulture habitat visited **Jatayu Conservation Breeding Centre (JCBC), Pinjore, Haryana**, to study the methods and status of conservation.
- Vulture Safe Zone (VSZ) initiative of the Pinjore JCBC to be implemented in Telangana.
- The project envisages elimination of the probability of consumption of the **drug diclofenac** through animal carcasses by the vultures within a radius of 100 km which is considered to be the range of the habitat.

Q.166) Satkosia Tiger Reserve was in news recently. It belongs to which state?

a) Karnataka
b) Maharashtra
c) Madhya Pradesh
d) Odisha

Q.166) Solution (d)

Six tigers from M.P. to be relocated to **Odisha's Satkosia Tiger Reserve**

Odisha government plans to revive big cat population in the protected forest.

According to the 2016 tiger census, Odisha had 40 Royal Bengal Tigers - 13 males, 24 females and three calves.

Q.167) Consider the following statements about Indian Pharmacopoeia Commission (IPC), which was in news recently. Identify the incorrect statement about it.

a) IPC replaced the pyrogen test and the abnormal toxicity test carried out on animals with tests that can be done in test tubes.
b) IPC is created to set standards of drugs in the country.
c) IPC is an autonomous institution of the Ministry for pharmaceuticals sector.
d) None

Q.167) Solution (c)

Indian Pharmacopoeia Commission (IPC) approves modern animal-free testing for drugs.

IPC replaces the **pyrogen test** and the **abnormal toxicity test** carried out on animals **with tests that can be done in test tubes**.

New testing methodology – IPC suggests bacterial endotoxin test or a monocyte activation test which can be carried out in test tubes. (Animal-free testing)

Do you know?

- IPC's decision is a step towards animal safety – it would spare animals from suffering due to drug experiments.
- Role of NGO/CSO - People for the Ethical Treatment of Animals (PETA) has been pushing for doing away with the cruel methods of testing on animals

About:

Pyrogen test

- The pyrogen test is carried out to check impurity or substance that can cause adverse side-effects. For the test, the drug is injected into a rabbit and the animal is closely observed for feverish symptoms.

Abnormal toxicity test

- The abnormal toxicity test is carried out to check potential hazardous biological contamination in vaccine formulations.

Indian Pharmacopoeia Commission (IPC)

- IPC is an Autonomous Institution of the Ministry of Health and Family Welfare.
- IPC is created to set standards of drugs in the country. Its basic function is to update regularly the standards of drugs commonly required for treatment of diseases prevailing in this region.
- It further promotes rational use of generic medicines by publishing National Formulary of India.

Q.168) Scientists have discovered a new species of gibbon living in south-west China's rainforests. Consider the below statements about Hoolock Gibbon found in India:

1. Hoolock gibbon is the only apes found in our country
2. This species is found in Western Ghats
3. Hoolock is listed as Endangered in the IUCN Redlist

Which of the above given statement(s) is/are correct?

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

Q.168) Solution (b)

The forests of north-east India are well known for the rich biodiversity they support, both faunal and floral. These forests also support the highest diversity of primates in India, including the only apes found in the country, the western hoolock gibbon (Hoolock hoolock) and the eastern hoolock gibbon (Hoolock leuconedys).

This species is found in eastern Bangladesh, northeastern India (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, and Tripura), and northwestern Myanmar (west of the Chindwin River). It might possibly occur in China (extreme southeastern Tibet). The distribution in India is restricted to points south of the Brahmaputra and east of the Dibang (Dingba Qu) Rivers

Hoolocks are listed as Endangered in the IUCN Redlist.

Q.169) Consider the following statements about GreenCo Rating System.

1. It facilitates companies in improving their overall green performance.
2. It is applicable to manufacturing facilities only.

Which of the above statements is/are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) None

Q.169) Solution (a)

Pursuing sustainable growth through preserving the environment is one of the hallmarks of Indian Railways. To further spread its green initiatives, Indian Railways had entered into partnership with the Confederation of Indian Industry (CII) in July 2016. As part of this partnership, CII is facilitating various railways' production units, workshops and other units go the Green way and, in the process, equipping them to green the operations and practices.

CII's GreenCo Rating **System is a first-of-its-kind rating in the world that facilitates companies in improving their overall green performance.** GreenCo focus on major environmental areas including- energy efficiency, renewable energy, water conservation, waste management, resource conservation, green supply chain, product stewardship and life cycle assessment.

It is applicable to both manufacturing facilities and service sector units.

Do you know?

- Green Rating for Integrated Habitat Assessment (GRIHA) is India's own rating system jointly developed by TERI and the Ministry of New and Renewable Energy, Government of India. It is a green building design evaluation system where buildings are rated in a three-tier process.

THINK!

- Leadership in Energy & Environmental Design India

(Source http://pib.nic.in/newsite/PrintRelease.aspx?relid=178627)

Q.170) Solar Radiation Management Governance Initiative is

a) Intergovernmental organization
b) NGO-driven project
c) Legally binding treaty
d) Environment based research group

Q.170) Solution (b)

The Solar Radiation Management Governance Initiative is an international, NGO-driven project that seeks to expand the global conversation around the governance of SRM geoengineering research.

The Royal Society, The academy of sciences for the developing world and Environmental Defense Fund (EDF) are its partners.

Do you know?

- Solar Geo-Engineering/Solar Radiation Management (SRM) is a process through which the reflectivity (albedo) of the Earth's atmosphere or surface is increased, in an attempt to offset some of the effects of GHG-induced climate change.

THINK!

- Carbon sequestration

(Source http://www.srmgi.org/)

Q.171) 'Trends.Earth' is

a) An online platform that monitors "land degradation".
b) An initiative by UNEP to increase awareness about degradation of soil.
c) An organization working to increase forest area on the earth.
d) An NGO that implements the UNCCD initiatives.

Q.171) Solution (a)

Trends.Earth is an online platform that monitors "land degradation" — the reduction or loss of the biological or economic productivity of land. Using satellite imagery and global data, Trends.Earth can identify degraded areas and help decision-makers improve them. Piloted in four African countries, the tool can now be used anywhere in the world.

The Sustainable Development Goals aim to achieve "land-degradation neutrality" - where the quality of land resources remains stable or increases - by 2030. Trends.Earth can support countries in achieving land-degradation neutrality. Without it, our future is not sustainable.

Do you know?

- UNCCD defines Land Degradation Neutrality (LDN) as a state whereby the amount and quality of land resources which is necessary to support ecosystem functions and enhance food security, remains stable or increases within specified temporal and spatial scales and ecosystems.

THINK!

- Global Land Outlook

Q.172) With regard to draft National Forest Policy, 2018, Consider the following statements.

1. It aims to set-up 3-tier institutions viz. National Board of Forestry (NBF), State Boards of Forestry and district Boards of Forestry.
2. Forest Skill Development Centers are part of this policy.

Which of the above statements is/are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) None

Q.172) Solution (b)

Recently, Ministry of Environment, Forests & Climate Change (MoEFCC) has released the draft National Forest Policy, 2018.

Setting up **National Board of Forestry (NBF)** at central level (headed by the Environment Minister) and **State Boards of Forestry at state** level (headed by state ministers in charge of forests) for ensuring inter-sectoral convergence, simplification of procedures, conflict resolution, etc. They will also periodically review implementation of this policy.

Forest Certification to enhance value of forest product harvested sustainably.

Forest Skill Development Centres, for skilling forest dependent population in forestry sector jobs, will be instituted for training of frontline staff who are at the cutting edge of the forest department.

Do you know?

- India targets a carbon sink of 2.5 to 3 billion tonnes of CO2 equivalent through additional forest and tree cover by 2030.

THINK!

- REDD+

(Source http://www.downtoearth.org.in/news/moef-releases-draft-national-forest-policy-2018-59898

https://www.livemint.com/Politics/YKRe5VogEJnpFzUdFKU0QJ/Government-unveils-draft-national-forest-policy.html)

Q.173) International Conference on Sustainable Biofuels 2018 held in which of the following nation?

a) India
b) China
c) Brazil
d) Indonesia

Q.173) Solution (a)

The two-day international conference on Sustainable Biofuels is jointly being **organized by Department of Biotechnology, Govt. of India and Biofuture platform**. The event is bringing experts and delegates from 19 countries together in Sustainable Biofuels sector to take stock of current knowledge, share information and best practices, and build consensus on the actions most needed to move forward.

Do you know?

Mission Innovation (MI)

- It is a global initiative of 22 countries and the European Union to dramatically accelerate global clean energy innovation.
- It seeks to double investments in clean energy innovation over five years.
- Department of Biotechnology (DBT) is nodal agency of this mission in India.

THINK!

- Biofuture Platform

Q.174) World Sustainable Development Summit 2018 is the flagship forum of

a) Sustainable Development Solutions Network.
b) The Energy and Resources Institute (TERI)
c) World Economic Forum.
d) UNEP

Q.174) Solution (b)

World Sustainable Development Summit 2018 was inaugurated by Prime Minister in New Delhi.

It is a flagship forum of The Energy and Resources Institute (TERI) which has been conceptualized as a single platform to accelerate actions towards sustainable development and climate change.

Do you know?

- Energy Transitions Commission India was launched by The Energy and Resources Institute (TERI) on the sidelines of the World Sustainable Development Summit (WSDS) 2018. It is a unique, high-level, multi-stakeholder platform with experts from diverse fields to suggest pathways for energy and electricity sector transitions in India.

THINK!

- Global Commission on the Economy and Climate

Q.175) Consider the following statements about Net Present Value [NPV] Of Forest.

1. It is defined under Forest Rights Act 2006.
2. It is calculated for a period of 50 years.
3. It is the amount paid by the project proponent for diverting land for non-forest use to compensate the loss in ecosystem services.

Which of the above statements is/are correct?

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

Q.175) Solution (b)

NET PRESENT VALUE [NPV] of FOREST

- It is defined under Forest (Conservation) Act of 1980.
- It is the amount paid by the project proponent for diverting land for non-forest use to compensate the loss in ecosystem services.
- It is calculated for a period of 50 years.

- For NPV estimation forests are categorized into six eco-classes, or forest types, and three canopy cover density classes—very dense forest, moderately dense forest and open forest.

Do you know?

- National Mission for a Green India or the Green India Mission (GIM), is one of the eight Missions outlined under India's action plan for addressing the challenge of climate change -the National Action Plan on Climate Change (NAPCC).

THINK!

- Ecosystem Services Improvement Project

Q.176) Which of the following are the physical processes responsible for the formation of Estuaries?

1. Rising sea level
2. Movement of sand and sandbars
3. Glacial processes
4. Tectonic processes

Select the appropriate code:

e) All of the above
f) 1 and 4 only
g) 1, 3 and 4 only
h) 1, 2 and 4 only

Q.176) Solution (a)

Explanation:

Most estuaries can be grouped into four geomorphic categories based on the physical processes responsible for their formation:

1) Rising sea level
2) Movement of sand and sandbars
3) Glacial processes
4) Tectonic processes

Q.177) Consider the following two statements:

1) The Centre can declare any animal 'vermin', under the Wildlife Protection Act, 1972, following requests from the respective States.

2) 'Vermin' provision can be utilized within specified territories of the States, and outside forests and protected areas.

Which of the above given statement(s) is/are correct?

a) 1 only
b) 2 only
c) Both
d) None

Q.177) Solution (b)

Explanation:

- As per Section 62 of the Wildlife Protection Act, 1972, States can send a list of wild animals to the Centre requesting it to declare them vermin for selective slaughter. The Central Government may by notification, **declare any wild animal other than those specified in Schedule I and part 11 of Schedule H of the law to be vermin** for any area for a given period of time. As long as the notification is in force such wild animal shall be included in Schedule V of the law, depriving them of any protection under that law.
- This reprieve means that those who kill these animals here will, for a year after these notifications come into effect, not be subject to the jail terms and fines that hunting these animals typically invite.

Do you know?

Wildlife laws divide species into 'schedules' ranked from I to V. Schedule I members are the best protected, in theory, with severe punishments meted out to those who hunt them. Wild boars, nilgai and rhesus monkeys are Schedule II and III members — also protected, but can be hunted under specific conditions. Crows and fruit bat fall in Schedule 5, the vermin category.

Q.178) Consider the following statements in regard to Aquatic Ecosystem:

1. Neustons are unattached organisms which live at the air-water interface
2. Nektons are organisms which remain attached to stems and leaves of rooted plants and substances emerging above the bottom mud
3. Planktons includes both microscopic plants like algae and animals like crustaceans and protozoans
4. Benthos or benthic organisms are those found living in the bottom of the water mass

Which of the above given statement(s) is/are correct?

e) 3 and 4 only
f) 1, 2 and 4 only
g) 1, 3 and 4 only
h) All of the above

Q.178) Solution (c)

Explanation:

- Neustons are unattached organisms which live at the air-water interface such as floating plants
- Periphytons are organisms which remain attached to stems and leaves of rooted plants and substances emerging above the bottom mud such as sessile algae and their associated group of animals
- Planktons includes both microscopic plants like algae (phytoplanktons) and animals like crustaceans and protozoans (zooplanktons) found in all aquatic ecosystems, except certain swift moving waters.
- Nektons are groups which contains animals which are swimmers
- Benthos or benthic organisms are those found living in the bottom of the water mass

Q.179) Consider the following statements regarding Carbon Monoxide:

1. CO is naturally formed in human body.
2. CO is a normal neurotransmitter.
3. Too much of Carbon monoxide is poisonous for humans.

Which of the above statements are incorrect?

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

Q.179) Solution (d)

None of the above statement is incorrect.

Carbon monoxide is naturally produced by the action of heme oxygenase 1 and 2 on the heme from hemoglobin breakdown. This process produces a certain amount of carboxyhemoglobin in normal persons, even if they do not breathe any carbon monoxide. Following the first report that carbon monoxide is a normal neurotransmitter in 1993, as

well as one of three gases that naturally modulate inflammatory responses in the body (the other two being nitric oxide and hydrogen sulfide), carbon monoxide has received a great deal of clinical attention as a biological regulator. In many tissues, all three gases are known to act as anti-inflammatories, vasodilators, and promoters of neovascular growth. Clinical trials of small amounts of carbon monoxide as a drug are ongoing. Nonetheless, too much carbon monoxide causes carbon monoxide poisoning.

Q.180) Consider the following statements regarding 'Dark Fermentation':

1. It is a method to produce Methane from solid Organic waste.
2. Dark fermentation differs from photofermentation in that it proceeds without the presence of light.

Which of the above statements are correct?

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

Q.180) Solution (b)

It is a method to produce Hydrogen as fuel from wastewater.

Dark fermentation is the biological H2 production by fermentative conversion of organic substances in the absence of light. This process is differing from Photofermentation, which is the fermentative conversion of organic substances to biological H2 by a diverse group of photosynthetic bacteria with the presence of light. The most important factor in these fermentations is presence or absence of ***light***.

Anaerobic digestion is the breakdown of organic materials into biogas such as methane and carbon dioxide in the absence of oxygen, naturally or in an anaerobic digester. The most important factor in this process is the absence of **oxygen**.

Q.181) Which among the following awards has been instituted by the Government of India for individuals or communities from rural areas that have shown extraordinary courage and dedication in protecting Wildlife?

a) Indira Gandhi Paryavaran Puraskar
b) Medini Puruskar Yojana
c) Amrita Devi Bishnoi Award
d) Pitambar Pant National Award

Q.181) Solution (c)

Amrita Devi Bishnoi Award

This award is given for significant contribution in the field of wildlife protection, which is recognised as having shown exemplary courage or having done exemplary work for the protection of wildlife. A cash award of Rupees One lakh is presented to individuals/institutions involved in wildlife protection.

Q.182) Consider the following statements:

1. Ozone is generally formed in upper stratosphere and sinks to lower stratosphere.
2. Ozone is measured in Dobson Unit in stratosphere.

Which of the above statements are correct?

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

Q.182) Solution (c)

The upper stratosphere is also known as Chemosphere because of the chemical reactions taking place there.
A *dobson unit* is the most basic measure used in ozone research. One *Dobson Unit* (DU) is defined to be 0.01 mm thickness at STP (standard temperature and pressure).

Q.183) Consider the following statements with reference to Kalam Plant:

1. It is a new plant species identified in Western Ghats region.
2. It is a small shrub, just 1 metre tall and unisexual in nature.
3. The plant is considered "Critically Endangered"

Which of the statements given above is/are true?

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

Q.183) Solution (c)

Scientists from the Botanical Survey of India had recently identified a new plant species from two protected National Parks in West Bengal. Named *Drypetes kalamii*, it is a small shrub found to be shorter version of its close relative *Drypetes ellisii*.

Standing just 1 metre tall, the newly described plant is unisexual in nature, which means they have separate male and female plants.

The new species is found in wet, shaded areas of subtropical moist semi-evergreen forests, at a height ranging 50-100 metres. With pale yellow flowers in clusters and bright orange to red fruits, the plant is exclusive to the two national parks.

By following the IUCN (International Union for Conservation of Nature) rules, the scientists have provisionally assessed the plant to be "Critically Endangered". The report states forest fires and grazing as two plausible threats to the new species.

Q.184) Consider the following statements about Basel Convention:

1. It is an international treaty that was designed to reduce the movements of hazardous waste between nations.
2. It specifically focuses on to prevent transfer of hazardous waste from developed to less developed countries (LDCs).
3. **It also addresses the movement of radioactive waste between different nations.**

Select the correct code:

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

Q.184) Solution (a)

Basel Convention is an international treaty that was designed to reduce the movements of hazardous waste between nations.

It specifically focuses on to prevent transfer of hazardous waste from developed to less developed countries (LDCs).

It does not, however, address the movement of radioactive waste.

Q.185) The Energy Conservation Building Code (ECBC) was developed by an Expert Committee, set up by India's Bureau of Energy Efficiency. It provides design norms for which of the following?

1. Building envelope, including thermal performance requirements for walls, roofs, and windows.
2. Lighting system, including daylighting, and lamps and luminaire performance requirements.
3. HVAC system, including energy performance of chillers and air distribution systems.
4. Water heating and pumping systems, including requirements for solar hot-water systems.

Select the correct answer using the code given below.

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

Q.185) Solution (d)

The Energy Conservation Building Code (ECBC) 2017 unveiled by the government compares very favourably with international best practices, and if implemented correctly, could make new buildings producers of electricity rather than simply consuming energy, according to the Green Business Certification Institute.

The 2017 ECBC is an update of the Code first introduced in 2007. Since the applicability of such codes on buildings falls under the states' jurisdictions, the Centre could not mandate their adoption, meaning that the 2007 Codes were not widely adopted. The 2017 Codes seem to have met with more success, having already been adopted by 12 states.

The ECBC provides design norms for:

- Building envelope, including thermal performance requirements for walls, roofs, and windows;
- Lighting system, including daylighting, and lamps and luminaire performance requirements;
- HVAC system, including energy performance of chillers and air distribution systems;
- Electrical system; and

- Water heating and pumping systems, including requirements for solar hot-water systems.

In order for a building to be considered ECBC-compliant, it would need to demonstrate minimum energy savings of 25%. Additional improvements in energy efficiency performance would enable the new buildings to achieve higher grades like ECBC Plus or Super ECBC status leading to further energy savings of 35% and 50%, respectively.

With the adoption of ECBC 2017 for new commercial building construction throughout the country, it is estimated to achieve a 50% reduction in energy use by 2030. This will translate to energy savings of about 300 Billion Units by 2030 and peak demand reduction of over 15 GW in a year. This will be equivalent to expenditure savings of Rs 35,000 crore and 250 million tonnes of CO2 reduction.

ECBC 2017 was developed by BEE with technical support from United States Agency for International Development (USAID) under the U.S.-India bilateral Partnership to Advance Clean Energy – Deployment Technical Assistance (PACE-D TA) Program.

Q.186) Consider the following pairs:

Programme/ Project ***Ministry***

1. National Lake Conservation Programme (NLCP) : : Ministry of Water Resources, River Development and Ganga Rejuvenation
2. Desert Development Programme (DDP) : : Ministry of Environment, Forests and Climate Change
3. The Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) : : Ministry of Rural Development

Which of the above pair(s) is/are correctly matched?

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

Q.186) Solution (b)

Correct pairs are given below:

- National Lake Conservation Programme (NCLP) is under Ministry of Environment, Forests and Climate Change

- Desert Development Programme (DDP) is under Ministry Rural Development.
- The Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) is under Ministry of Rural Development

Q.187) Observe the statements with regard to the general characteristics for Lake Ecology:

1. The nutrient content is very low in *Oligotrophic* whereas nutrient content is very high in *Eutrophic*
2. Oxygen in the hypolimnion (bottom layer) is present in *Eutrophic* whereas is absent in *Oligotrophic.*
3. Number of plant and animal species is fewer in *Eutrophic* whereas quite many species re present in *Oligotrophic*.

Choose the correct codes:

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

Q.187) Solution (b)

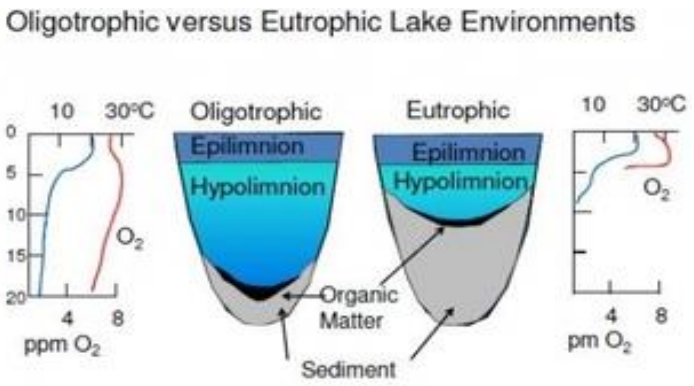
Like any organism, lakes are born as they originate by various geological and geomorphic events, and grow with time to change in their various morphological and functional characteristics and eventually die.

On the basis of their nutrient content, they are categorized as ***Oligotrophic*** (very low nutrients), ***Mesotrophic*** (moderate nutrients) and ***Eutrophic*** (highly nutrient rich).

Vast majority of lakes in India are either Eutrophic or Mesotrophic because of the nutrients derived from their surroundings or organic waste entering them.

- Oxygen in the hypolimnion (bottom layer) is absent in *Eutrophic* whereas is present in *Oligotrophic.*
- Number of plant and animal species is fewer in *Eutrophic* whereas quite many species are present in *Oligotrophic*.
- Aquatic plant production is low in *Oligotrophic* whereas high in *Eutrophic*
- Depth tend to be deeper in *Oligotrophic* whereas tend to be shallower in *Eutrophic*

- Total Salts or conductance is usually lower in *Oligotrophic* whereas sometimes higher in *Eutrophic*



Oligotrophic (less life) vs. Eutrophic (more life)

- Lakes

Figure 50.17 An oligotrophic lake in Grand Teton, Wyoming. A eutrophic lake in Okavango delta, Botswana

Q.188) Open-stunted forest with bushes and small trees having long roots and sharp thorns or spines are commonly found in

a) Eastern Orissa
b) North-eastern Tamil Nadu
c) Shiwaliks and Terai regions
d) Western Andhra Pradesh

Q.188) Solution (d)

Open-stunted forest with bushes and small trees having long roots and sharp thorns or spines are common features of semi-arid or tropical thorn type of vegetation.

Eastern Orissa is wrong option since it has swamp/littoral and tropical evergreen and moist deciduous climate. Even North Eastern Tamil Nadu is ruled out as it has tropical dry evergreen as shown in figure below. (Refer to the map)

Shiwaliks and Terai regions are characterised by tall grasslands, scrub savannah, sal forests and clay rich swamps. They fall in tropical dry and moist deciduous.
Therefore, correct answer is Western Andhra Pradesh – which is characterized by Tropical thorn type of vegetation.

Q.189) Consider the following statements about Petroleum and Explosives Safety Organization (PESO).

1. The PESO has been testing samples of crackers for all types of pollutions.
2. It functions under Ministry of Petroleum and Natural Gas.

Which of the above statements is/are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) None

Q.189) Solution (d)

Petroleum and Explosives Safety Organisation (PESO)

It is the apex department to control and administer manufacture, storage, transport and handling of explosives, petroleum, compressed gases and other hazardous substances in India.

Procurement of raw materials for fireworks does not come under the purview of the Explosives Act. **The PESO has been testing samples of crackers only for adherence to the sound limit of 125 decibels at a distance of four meters.**

It functions under the **Department of Industrial Policy and Promotion (DIPP), Ministry of Commerce and Industry.** HQ at Nagpur

It administers the responsibilities delegated under the Explosives Act 1884 and Petroleum Act 1934.

Do you know?

- Supreme Court imposed a ban on the use of antimony, lithium, mercury, arsenic and lead in the manufacture of firecrackers to prevent air pollution. SC entrusted the Petroleum and Explosive Safety Organization (PESO) with the responsibility of ensuring compliance.

THINK!

- Health hazards from fire crackers.

(Source http://www.thehindu.com/news/national/after-sc-order-focus-on-chemicals-in-firecrackers/article19440256.ece)

Q.190) consider the following pairs.

Protected areas of India	IUCN equivalent category
National parks	IUCN category II
Biosphere reserve	IUCN category V
Community reserve	IUCN category VI
Wildlife sanctuaries	IUCN category IV

Which of the above pairs is/are correctly matched?

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

Q.190) Solution (d)

National parks (IUCN Category II)

A national park (IUCN Category II) is similar to a wilderness area in its size and its main objective of protecting functioning ecosystems. However, national parks tend to be more lenient with human visitation and its supporting infrastructure. National parks are managed in a way that may contribute to local economies through promoting educational and recreational tourism on a scale that will not reduce the effectiveness of conservation efforts.

Wildlife sanctuaries (IUCN Category IV)

A habitat or species management area (IUCN Category IV) is similar to a natural monument or feature but focuses on more specific areas of conservation (though size is not necessarily

a distinguishing feature), like an identifiable species or habitat that requires continuous protection rather than that of a natural feature.

Biosphere reserve (UNESCO designation roughly corresponding to IUCN Category V)

A protected landscape or protected seascape (IUCN Category V) covers an entire body of land or ocean with an explicit natural conservation plan, but usually also accommodates a range of for-profit activities.

Conservation reserve and Community reserve (IUCN Category V and VI respectively)

Though human involvement is a large factor in the management of these protected areas, developments are not intended to allow for widescale industrial production. The IUCN recommends that a proportion of the land mass remains in its natural condition—a decision to be made on a national level, usually with specificity to each protected area. Governance has to be developed to adapt the diverse—and possibly growing—range of interests that arise from the production of sustainable natural resources.

Do you know?

- Leaders for Nature (LfN) is a business biodiversity network, initiated in the Netherlands by IUCN in 2005. LfN engages multinationals to work towards greening the economy. By offering knowledge and training, hands-on project support and inspiration, LfN stimulates and facilitates companies to take the lead on incorporating natural capital into their core business.

THINK!

- Sustainable Agriscapes for the Future project.

(Source (https://en.wikipedia.org/wiki/IUCN_protected_area_categories#Category_II_.E2.80.94_National_Park

https://en.wikipedia.org/wiki/Protected_areas_of_India)

Q.191) Consider the following statements about Convention on Long-Range Transboundary Air Pollution, often abbreviated as Air Pollution or CLRTAP.

1. It is implemented by UNEP.
2. India is party to this convention.

Which of the above statements is/are correct?

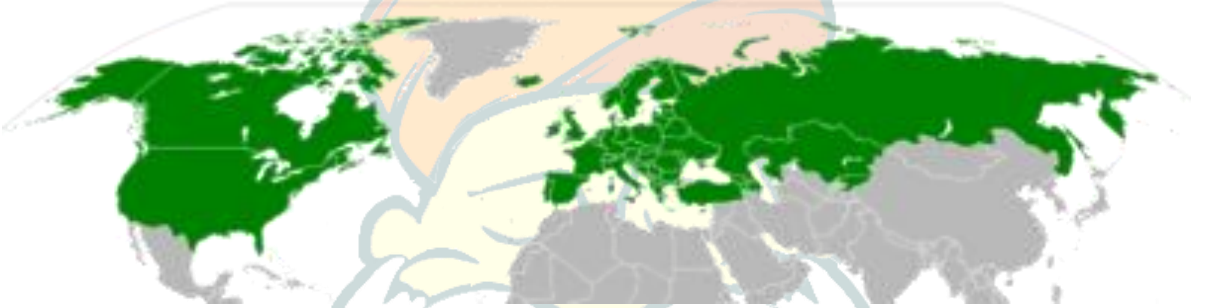
a) 1 only
b) 2 only

c) Both 1 and 2
d) None

Q.191) Solution (d)

The Convention on Long-Range Transboundary Air Pollution, often abbreviated as Air Pollution or CLRTAP, is intended to protect the human environment against air pollution and to gradually reduce and prevent air pollution, including long-range transboundary air pollution. **It is implemented by the European Monitoring and Evaluation Programme (EMEP),** directed by the United Nations Economic Commission for Europe (UNECE).

India is not signatory to this convention.



Map showing signatories of the Convention on Long-Range Transboundary Air Pollution

Do you know?

- Gothenburg Protocol: It aims to Abate Acidification, Eutrophication and Ground-level Ozone and is a part of is part of the Convention on Long-range Transboundary Air Pollution.

THINK!

- International Nitrogen Initiative (INI)
- Kyoto Protocol

Q.192) Scientific Committee on Problems of the Environment (SCOPE)'s primary function is

a) To advise the UN members on key environmental issues.
b) To study the environmental impact of Scientific inventions.
c) To develop scientific reviews of key environmental issues.
d) All the above

Q.192) Solution (c)

The Scientific Committee on Problems of the Environment (SCOPE) was established by the 10th meeting of the Executive Committee of **the International Council for Science (ICSU**) in 1969. SCOPE's members include 38 national science academies and research councils, and 22 international scientific unions. **The secretariat is located in the Netherlands.**

SCOPE exists **primarily to develop scientific reviews of key environmental issues** around the themes of managing societal and natural resources, ecosystem processes, and biodiversity, health and environment.

Do you know?

- The International Council for Science (ICSU, after its former name, International Council of Scientific Unions) is an international organization devoted to international cooperation in the advancement of science.
- India is member of this council.

THINK!

- International Environmental Law (IEL)

Q.193) Consider the following statements about United Nations Convention to Combat Desertification (UNCCD).

1. It is the only internationally legally binding framework set up to address the problem of desertification.
2. The Convention is based on the principles of participation, partnership and decentralization.
3. The Conference of the Parties (COP) will be held biennial.

Which of the above statements is/are correct?

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

Q.193) Solution (d)

The **United Nations Convention to Combat Desertification** in Those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa (UNCCD) is a Convention to combat desertification and mitigate the effects of drought through national action programs

that incorporate long-term strategies supported by international cooperation and partnership arrangements.

The Convention, the only convention stemming from a direct recommendation of the Rio Conference's Agenda 21, was adopted in Paris, France on 17 June 1994 and entered into force in December 1996. **It is the only internationally legally binding framework set up to address the problem of desertification. The Convention is based on the principles of participation, partnership and decentralization—**the backbone of Good Governance and Sustainable Development. It has 197 parties, making it near universal in reach.

The first five sessions of the COP were held annually from 1997 to 2001. Starting 2001 sessions are held on a biennial basis.

Do you know?

- Loss of soil cover, mainly due to rainfall and surface runoff, is one of the biggest reasons for desertification. It is responsible for 10.98 per cent of desertification in the country. Water erosion is observed in both hot and cold desert areas, across various land covers and with varying levels of severity. The next big reason is wind erosion.

THINK!

- UNFCCC (United Nations Framework Convention on Climate Change)

Q.194) Consider the following statements about Strategic Approach to International Chemicals Management (SAICM).

1. It was adopted by the First International Conference on Chemicals Management (ICCM1).
2. India is the member of this Multilateral Environmental Agreement.

Which of the above statements is/are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) None

Q.194) Solution (c)

Adopted by the First International Conference on Chemicals Management (ICCM1) on 6 February 2006 in Dubai, the **Strategic Approach to International Chemicals Management (SAICM) is a policy framework to promote chemical safety around the world.**

SAICM was developed by a multi-stakeholder and multi-sectoral Preparatory Committee and supports the achievement of the 2020 goal agreed at the 2002 Johannesburg World Summit on Sustainable Development. SAICM overall objective is the achievement of the sound management of chemicals throughout their life cycle so that by the year 2020, chemicals are produced and used in ways that minimize significant adverse impacts on the environment and human health.

India is the member of this Multilateral Environmental Agreement.

Do you know?

- SAICM comprises the **Dubai Declaration on International Chemicals Management,** expressing high-level political commitment to SAICM, and an Overarching Policy Strategy which sets out its scope, needs, objectives, financial considerations underlying principles and approaches, and implementation and review arrangements.

THINK!

- Stockholm Convention on Persistent Organic Pollutants (POPs).

(Source http://www.saicm.org/About/SAICMOverview/tabid/5522/language/en-US/Default.aspx)

Q.195) Consider the following statements about International Whaling Commission (IWC).

1. IWC adopted a moratorium on commercial whaling, which was welcomed by all UN members.
2. Indian Ocean Whale Sanctuary is the only designated sanctuary by IWC.

Which of the above statements is/are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) None

Q.195) Solution (d)

The International Whaling Commission (IWC) is an international body set up by the terms of the International Convention for the Regulation of Whaling (ICRW), which was signed in Washington, D.C., United States, on December 2, 1946 to **"provide for the proper conservation of whale stocks and thus make possible the orderly development of the whaling industry.**

In 1982 the IWC adopted a moratorium on commercial whaling. **Currently, Japan, Russia, and a number of other nations oppose this moratorium.**

The Indian Ocean Whale Sanctuary is an area in the Indian Ocean where the International Whaling Commission (IWC) has banned all types of commercial whaling. The IWC has at present designated two such sanctuaries, the other being the **Southern Ocean Whale Sanctuary.**

Do you know?

- India is member of IWC.

THINK!

- CMS
- CITES
- TRAFFIC

Q.196) Consider the following statements regarding Cartagena Protocol:

1. The protocol seeks to protect biodiversity from environmental threats like acid rain, pollution, land degradation etc.
2. It allows member countries to ban imports of genetically modified organisms if they feel that there is not enough scientific evidence that the product is safe.

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.196) Solution (b)

Cartagena Protocol on Biosafety

The Cartagena Protocol on Biosafety to the Convention on Biological Diversity is an international agreement on biosafety as a supplement to the Convention on Biological Diversity effective since 2003. The Biosafety Protocol seeks to protect biological diversity from the potential risks posed by genetically modified organisms resulting from modern biotechnology.

The Biosafety Protocol makes clear that products from new technologies must be based on the precautionary principle and allow developing nations to balance public health against economic benefits. It will for example let countries ban imports of genetically modified organisms if they feel there is not enough scientific evidence that the product is safe and requires exporters to label shipments containing genetically altered commodities such as corn or cotton.

Objective

the objective of the Protocol is to contribute to ensuring an adequate level of protection in the field of the safe transfer, handling and use of 'living modified organisms resulting from modern biotechnology' that may have adverse effects on the conservation and sustainable use of biological diversity, taking also into account risks to human health, and specifically focusing on transboundary movements

Living Modified Organism

The protocol defines a 'living modified organism' as any living organism that possesses a novel combination of genetic material obtained through the use of modern biotechnology, and 'living organism' means any biological entity capable of transferring or replicating genetic material, including sterile organisms, viruses and viroids. 'Modern biotechnology' is defined in the Protocol to mean the application of in vitro nucleic acid techniques, or fusion of cells beyond the taxonomic family, that overcome natural physiological reproductive or recombination barriers and are not techniques used in traditional breeding and selection. 'Living modified organism (LMO) Products' are defined as processed material that are of living modified organism origin, containing detectable novel combinations of replicable genetic material obtained through the use of modern biotechnology. Common LMOs include agricultural crops that have been genetically modified for greater productivity or for resistance to pests or diseases. Examples of modified crops include tomatoes, cassava, corn, cotton and soybeans. 'Living modified organism intended for direct use as food or feed, or for processing (LMO-FFP)' are agricultural commodities from GM crops. Overall the term 'living modified organisms' is equivalent to genetically modified organism – the Protocol did not make any distinction between these terms and did not use the term 'genetically modified organism.'

Q.197) Recently Kigali Agreement was in the news. Which of the following statements is/are correct regarding Kigali Agreement?

1. It is an amendment in Kyoto protocol.

2. As per the agreement, member countries are expected to reduce the manufacture and use of **Hydrofluorocarbons (HFCs)** by roughly 80-85% from their respective baselines, till 2045.

Select the code from below:

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

Q.197) Solution (b)

Kigali Agreement

- In the 28th meeting of the Parties to the Montreal Protocol, negotiators from 197 nations have signed a historic agreement to amend the Montreal Protocol in Kigali, a capital city of a tiny African country, Rwanda on 15th October 2016.
- As per the agreement, these countries are expected to reduce the manufacture and use of **Hydrofluorocarbons (HFCs)** by roughly 80-85% from their respective baselines, till 2045.
- This phase down is expected to arrest the global average temperature rise up to 0.5° C by 2100.
- Kigali agreement is an amendment to Montreal Protocol.

Kigali Agreement: Important Points

- It is a **legally binding agreement** between the signatory parties with non-compliance measures.
- It will come into effect from 1st January 2019 provided it is ratified by at least 20 member parties by then.
- It has shown a considerable flexibility in approach while setting phase-down targets for different economies accommodating their developmental aspirations, different socio-economic compulsions, and scientific & technological capabilities.
- It has divided the signatory parties into three groups-

1. **The first group** consists of rich and developed economies like USA, UK and EU countries who will start to phase down HFCs by 2019 and reduce it to 15% of 2012 levels by 2036.
2. **The second group** consists of emerging economies like China, Brazil as well as some African countries that will start phase down by 2024 and reduce it to 20% of 2021 levels by 2045.

3. **The third group** consists of developing economies and some of the hottest climatic countries like India, Pakistan, Iran, Saudi Arabia who will start phasing down HFCs by 2028 and reduce it to 15% of 2024-2026 levels till 2047.

Q.198) Which of the following statements regarding Biocarbon Fund Initiative are correct?

1. The BioCarbon Fund Initiative for Sustainable Forest Landscapes collaborates with forest countries around the world to reduce emissions from the land sector.
2. It is a multilateral fund managed by UNFCCC.
3. It seeks to promote reduced greenhouse gas emissions from the land sector, from deforestation and forest degradation in developing countries (REDD+), and from sustainable agriculture, as well as smarter land-use planning, policies and practices.

Select the code from following:

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

Q.198) Solution (c)

BioCarbon Fund Initiative

The BioCarbon Fund Initiative for Sustainable Forest Landscapes (ISFL) is a multilateral fund, supported by donor governments and managed by the **World Bank**. It seeks to promote reduced greenhouse gas emissions from the land sector, from deforestation and forest degradation in developing countries (REDD+), and from sustainable agriculture, as well as smarter land-use planning, policies and practices.

The initiative will be managed by the BioCarbon Fund, a public-private program housed within the World Bank that mobilizes finance for activities that sequester or conserve carbon emissions in forest and agricultural systems.

The new *Initiative for Sustainable Forest Landscapes* seeks to scale up land-management practices across large landscapes, including improved livestock management, climate-smart agriculture, and sustainable forest management, with a focus on protecting forests and greening and securing supply chains.

Think

- Global Environment Fund

Q.199) The Central Zoo Authority of India (CZA) is the body of the government of India responsible for oversight of zoos. Which of the following statements are correct regarding CZA?

1. It is a statutory body
2. It is an affiliate member of the World Association of Zoos and Aquariums (WAZA)
3. It regulates the exchange of animals of endangered category Listed under Schedule-I and II of the Wildlife Protection Act among zoos.

Select the code from following:

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

Q.199) Solution (d)

Central Zoo Authority of India (CZA)

The Central Zoo Authority of India (CZA) is the body of the government of India responsible for oversight of zoos. It is an affiliate member of the World Association of Zoos and Aquariums (WAZA).

The Central Zoo Authority has been constituted under the Wild Life (Protection) Act. The Authority consists of a Chairman, ten members and a Member Secretary. The main objective of the authority is to complement the national effort in conservation of wild life. Standards and norms for housing, upkeep, health care and overall management of animals in zoos has been laid down under the Recognition of Zoo Rules, 1992. Every zoo in the country is required to obtain recognition from the Authority for its operation. The Authority evaluates the zoos with reference to the parameters prescribed under the Rules and grants recognition accordingly. Zoos which have no potential to come up to the prescribed standards and norms may be refused recognition and asked to close down.

Apart from the primary function of grant of recognition and release of financial assistance, the Central Zoo Authority also regulates the exchange of animals of endangered category Listed under Schedule-I and II of the Wildlife Protection Act) among zoos. Exchange of animals between Indian and foreign zoos is also approved by the Authority before the

requisite clearances under EXIM Policy and the CITES permits are issued by the competent authority.

Think

- Ex – Situ Conservation
- Gene pool

Q.200) Kappatagudda Forest has been in news for removal of conservation tag and restoration of the same. In which state does it lie?

a) Tamil Nadu
b) Kerala
c) Chhattisgarh
d) Karnataka

Q.200) Solution (d)

On November 4 2016, the government decided to withdraw the conservation tag which was accorded to Kappatagudda in the preceding year of 2015, leading to an agitation in Gadag district. Environmentalists considered it as doomsday for the forest reserve.

With the forest having deposits of close to 50 tonnes of unadulterated and pure gold reserves, the Ramgad Mines and Minerals limited (RMML), a subsidiary of the Baldota group of companies, had been given a mining license in 2012 itself.

Karnataka chief minister has decided to go along with larger consensus in the controversial environment versus development issue in the Kappatagudda forest reserve case and restore the "conservation reserve" tag.

Q.201) The State Government in consultation with local bodies may notify the areas of biodiversity importance as Biodiversity Heritage Sites (BHS). Which of the following statements regarding BHS is/are correct?

1. In order to get BHS tag, the area should have 10 or 0.5% of the vascular endemic species.
2. 70% of the biodiversity in the area should have been destroyed.

Select the code from following:

a) 1 only

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

Q.201) Solution (d)

"Biodiversity Heritage Sites" (BHS)

Under Section 37 of Biological Diversity Act, 2002 (BDA) the State Government in consultation with local bodies may notify in the official gazette, areas of biodiversity importance as Biodiversity Heritage Sites (BHS).

"Biodiversity Heritage Sites" (BHS) are well defined areas that are unique, ecologically fragile ecosystems – terrestrial, coastal and inland waters and, marine having rich biodiversity comprising of any one or more of the following components: richness of wild as well as domesticated species or intra-specific categories, high endemism, presence of rare and threatened species, keystone species, species of evolutionary significance, wild ancestors of domestic/cultivated species or their varieties, past pre-eminence of biological components represented by fossil beds and having significant cultural, ethical or aesthetic values and are important for the maintenance of cultural diversity, with or without a long history of human association with them. All other terms used are as defined in Section 2 of the Biological Diversity Act (2002).

Significance and objectives of Biodiversity Heritage sites

a. Biodiversity is closely linked to ecological security and therefore, human welfare. To strengthen the biodiversity conservation in traditionally managed areas and to stem the rapid loss of biodiversity in intensively managed areas, such areas need special attention.

b. Such areas also often represent a positive interface between nature, culture, society, and technologies, such that both conservation and livelihood security are or can be achieved, and positive links between wild and domesticated biodiversity are enhanced.

c. To have a BHS in or around a community should be a matter of pride and honour to such community and this virtuous act of community may work as an example to the entire nation apart from ensuring availability of the resources to their own future generation. The areas like existing sacred grooves in general and those existing in Western Ghats in particular can be straight away be declared and notified as BHS.

d. It is necessary to instill and nurture conservation ethics in all sections of the society. The creation of BHS will ensure bringing home these values in the society and thereby put an end to over-exploitation of natural resources and avoid environmental degradation.

e. The creation of BHS may not put any restriction on the prevailing practices and usages of the local communities, other than those voluntarily decided by them. The purpose is to enhance the quality of life of the local communities through this conservation measure.

Do you know?

- **Ameenpur Lake** has the distinction of being the **first water body in the country to be declared a Biodiversity Heritage Site**. Ameenpur Lake dates back to the time of Ibrahim Qutb Shah, who ruled the kingdom of Golconda between 1550 and 1580.

Q.202) Consider the following statements regarding Cryopreservation:

1. It is the process of preserving biological material by freezing it at extreme temperatures.
2. In the process the material is heated to boiling point in water and then suddenly the temperature is dropped to freezing point.
3. It is used to increase the shelf life of fruits and vegetables.

Which of the above statements are NOT correct?

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

Q.202) Solution (b)

Cryopreservation

Cryopreservation is the process of freezing biological material at extreme temperatures; most common -196 °C/-321 °F in liquid nitrogen (N_2). At these low temperatures, all biological activity stops, including the biochemical reactions that lead to cell death and DNA degradation. This preservation method in theory makes it possible to store living cells as well as other biological material unchanged for centuries.

The challenge of cryopreservation is to help cells to survive both cooling to extreme temperatures and thawing back to physiological conditions. Intracellular ice formation in particular is a critical issue that has to be controlled to keep the cell membrane intact and the cells alive. The crucial elements to prevent this are the freezing rate (degrees per minute) and the composition of the freezing medium used. The freezing medium generally

consists of a diluter, (sometimes) a protein source, as well as a cryoprotectant compound. The choice of most suitable cryoprotectant will influence the preservation result and will be different between different cells and different species.

Cryopreservation technology is important in breeding programs to preserve desired genes, but also provides an opportunity to save endangered species.

Do you know?

- In physics, **cryogenics** is the production and behaviour of materials at very low temperatures.
- **Cryonics**- the practice or technique of deep-freezing the bodies of people who have just died, in the hope that scientific advances may allow them to be revived in the future.

Q.203) The theme of World Environment Day 2018 is –

a) "Beat Plastic Pollution"
b) "Wetlands for a Sustainable Urban Future"
c) "End Plastic Pollution"
d) "Nature for Water" – exploring nature-based solutions to the water challenges we face in the 21st century.

Q.203) Solution (a)

World Environment Day 2018

India to host World Environment Day 2018

India is the global host of 2018 World Environment Day which will take place on June 5, 2018. With **"Beat Plastic Pollution"** as the theme for this year's edition, the world is coming together to combat single-use plastic pollution.

Earth Day 2018

The theme of Earth Day 2018 is **"End Plastic Pollution"**. Earth Day 2018 is dedicated to providing the information and inspiration needed to fundamentally change human attitude and behavior about plastics.

The idea is to encourage people to cut down on their plastic consumption by paying a closer attention to the number of plastic items each person consumes annually and make a

conscious effort to reduce the amount. According to a paper published in scientific journal Chemistry & Biology in 2009, plastic is non-biodegradable and disposed plastic can remain in the environment for up to 2,000 years.

Do you know?

- The first Earth day was celebrated on April 22, 1970 and has ever since been an annual event.
- The person credited for organising the event 48 years ago is US Senator Gaylord Nelson.

Q.204) Recently, a river turtle with a distinctive green punk-rock hairstyle, two spikes under its chin and the ability to breathe through its genitals (called Mary River Turtle) was added to a new list of endangered reptiles. This unique turtle is endemic to?

a) Antarctica
b) Australia
c) North America
d) South America

Q.204) Solution (b)

Turtle with punk hairdo on endangered species list

Boasting a green, punk hairdo and the unusual ability to breathe through its backside, an Australian turtle has become famous overnight but not only for its eccentricity.

Unfortunately, just as many people are discovering the Mary River Turtle's tantalising traits, it has become the latest creature to join the **"EDGE of Existence"** list of endangered species compiled by the Zoological Society of London (ZSL).

Where is it found?

- A **native of Queensland, Australia**, the turtle was one of 100 reptiles added to the catalogue this week.
- It lives **only in the Mary River** from which it takes its name.

Do you know?

- The green-haired turtle is 30th on a new list of reptiles in trouble put out by the Zoological Society of London that ranks reptiles on a combination of how distinctive and how endangered they are. It has special organs in the end of its digestive system

that allow it to draw oxygen from the water. It can stay underwater for up to three days.

Source: http://www.thehindu.com/todays-paper/tp-life/turtle-with-punk-hairdo-on-endangered-species-list/article23532566.ece

Q.205) Consider the following statements about National Air Quality Monitoring Programme: (NAMP)

1. CPCB has been executing a nationwide Programme of ambient air quality monitoring known as NAMP.
2. Currently, System of Air Quality and Weather Forecasting and Research (SAFAR), run out of Indian Institute of Tropical Meteorology (IITM), Pune, serves as apex forecaster of pollution trends in Delhi, Mumbai, Pune and Ahmedabad.
3. The National Ambient Air Quality Standards has undertaken 5 pollutants only.

Which of the statement given above is/are correct?

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

Q.205) Solution (a)

In India, The Central Pollution Control Board (CPCB) has been executing a nationwide Programme of ambient air quality monitoring known as National Air Quality Monitoring Programme (NAMP).

The National Air Quality Monitoring Programme (NAMP) is undertaken in India

i) to determine status and trends of ambient air quality;
ii) to ascertain the compliance of NAAQS;
iii) to identify non-attainment cities;
iv) to undertake preventive and corrective measures.

Annual average concentration of SOx levels are within the prescribed National Ambient Air Quality Standards (NAAQS).

The NAAQS has been revisited and revised for 12 pollutants which includes;

1. Sulphur dioxide
2. Nitrogen dioxide

3. PM(10)
4. PM(2.5)
5. ozone
6. lead
7. carbon monoxide
8. arsenic
9. nickel
10. benzene
11. ammonia
12. benzopyrene

Q.206) Consider the following pairs and identify the correct pairs:

1. Basel Convention : : Control of Transboundary Movements of Hazardous Wastes and their Disposal
2. Rotterdam Convention: : certain Hazardous Chemicals and Pesticides in International Trade
3. Stockholm Convention : : persistent Organic Pollutants (POPs)

Choose correct answer:

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

Q.206) Solution (d)

Basel Convention

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal was adopted in 1989 in Basel, Switzerland. The overarching objective of the Basel Convention is to protect human health and the environment against the adverse effects of hazardous wastes. Its scope of application covers a wide range of wastes defined as "hazardous wastes" based on their origin and/or composition and their characteristics, as well as two types of wastes defined as "other wastes" (household waste and incinerator ash).

Rotterdam Convention

The Rotterdam Convention on the prior informed consent procedure for certain Hazardous Chemicals and Pesticides in International Trade came into force in 2004. India acceded to the convention a year later.
There are 47 chemicals listed in Annex III to this Convention, which include 33 pesticides and 14 industrial chemicals that have been banned or severely restricted for health or environmental reasons.

Stockholm Convention

The Stockholm Convention on persistent Organic Pollutants (POPs) is a global treaty to protect human health and the environment from POPs. The Convention sought initially 12 chemicals, for restriction or elimination of the production and release. Now, the Convention covers 23 chemicals.

Q.207) Consider the following International Conventions

1. Aarhus Convention
2. Geneva Convention
3. Stockholm Convention
4. Rotterdam Convention
5. Basel Convention
6. Bonn Convention

Which of the above are related to Hazardous Substances?

a) 1, 2, 3, 5 and 6
b) 2, 3, 4 and 5
c) 1, 2, 3, 4, 5 and 6
d) 1, 2, 3, 4 and 5

Q.207) Solution (b)

Aarhus Convention- The UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, usually known as the Aarhus Convention.

Bonn Convention- The Convention on the Conservation of Migratory Species of Wild Animals -- more commonly abbreviated to just the Convention on Migratory Species (CMS) or the Bonn Convention -- aims to conserve terrestrial, marine and avian migratory species throughout their range.

Q.208) 'BioCarbon Fund Initiative for Sustainable Forest Landscapes' is managed by the

a) Asian Development Bank
b) International Monetary Fund
c) United Nations Environment Programme
d) World Bank

Q.208) Solution (d)

Housed within the Carbon Finance Unit of the World Bank, the BioCarbon Fund is a public-private sector initiative mobilizing financing to help for development of projects that sequester or conserve carbon in forest and agro-ecosystems. It was created in 2004.

Q.209) Consider the following regarding 'Conservation International'

1. It is an international organization under United Nation Environment Program (UNEP) that aims to help stabilize global climate, protect fresh water, and ensure human well-being.
2. Biodiversity Hotspots is an initiative of Conservation International.

Select the correct statement/s

a) 1 only
b) 2 only
c) Both
d) None

Q.209) Solution (b)

Conservation International (CI)

An American non-profit environmental organization headquartered in Arlington, Virginia. Its goal is to protect nature as a source of food, fresh water, livelihoods and a stable climate.

It employs scientists and policy experts to balance healthy ecosystems with sustainable human use. Conservation International aims to help stabilize global climate, protect fresh water, and ensure human well-being. To achieve their goals they work with indigenous peoples and non-governmental organization. Conservation International's primary initiatives include climate, fresh water, food, health, culture, and biodiversity.

Of all the significant initiatives Conservation International has achieved, its Biodiversity Hotspots project is the most impressive. This project identifies and protects biological hotspots—places that exhibit the richest diversity and most threatened collections of plants and animals on our planet.