

## Solutions- All Environment Questions

### 1. Solution: 4

**Explanation:** Except for the deep sea hydro-thermal ecosystem, sun is the only source of energy for all ecosystems on Earth. Of the incident solar radiation less than 50 per cent of it is **photosynthetically active radiation** (PAR).

### 2. Solution: 4

In ecology, productivity or production refers to the rate of generation of biomass in an ecosystem. It is usually expressed in units of mass per unit surface (or volume) per unit time, for instance grams per square metre per day ( $\text{g m}^{-2} \text{d}^{-1}$ ). The mass unit may relate to dry matter or to the mass of carbon generated. Productivity of autotrophs such as plants is called primary productivity, while that of heterotrophs such as animals is called secondary productivity.

Look into these links for the reference of Productivity chart. It is important

<http://loki.stockton.edu/~cromartj/ecology/ecolectures/26produc.htm>

<http://www.globalchange.umich.edu/globalchange1/current/lectures/klings/energyflow/energyflow.html>

### 3. Solution: 4

#### Explanation:

There are three ways an ecological pyramid can be represented. A Pyramid of Numbers can be generated by counting all the organisms at the different feeding levels. As you might guess, this can be a very difficult task since we are not just identifying each species in the ecosystem. We are also counting how many of each species is present. On occasion, this approach will not work. For example, one tree (a producer) can represent an ecosystem and harbor numerous populations of herbivores and carnivores. Thus, the bottom of the pyramid would be very small and not flared out.

A second type of pyramid is called a Pyramid of Biomass where organisms are collected from each feeding level, dried and then weighed. This dry weight (biomass) represents the amount of organic matter (available energy) of the organisms. [Note that there are alternate, nonlethal ways to determine biomass.] While this approach will generally create a pyramid that illustrates energy flow, its use can also produce an inverted pyramid. For example, in aquatic ecosystems, phytoplankton could reproduce and then be eaten rapidly by zooplankton. Therefore, it would be possible to have few herbivores and a lot of carnivores when a collection is taken.

A third type of pyramid called a Pyramid of Energy Flow tends to resolve these problems. This approach necessitates measuring the caloric value of the different organisms that make up the community. It nicely shows how energy is continually decreasing along the food chain from producers to top level carnivores.

The pyramids of numbers and biomass may be upright or inverted depending upon the nature of the food chain in the particular ecosystem, whereas pyramids of energy are always upright.

In a forest ecosystem, however, the pyramid of numbers is somewhat different in shape. The producers, which are mainly large-sized trees, are lesser in number, and form the base of the pyramid. The herbivores, which are the fruit-eating birds, elephants, deer's etc. are more in number than the producers.

#### 4. Solution: 2

##### Explanation:

Examples of secondary succession include:

The renewal of a forest after a fire: The fire itself destroys a majority of different types of trees and plant life. Because seeds and roots and other plant and tree parts remain in and on the soil, gradually the plants and trees begin to grow again and eventually return to the state of the original ecosystem.

The renewal of a crop after harvesting: A crop is completed harvested when it becomes ripe. Without new seeds being planted, the crop can regenerate the following year due to the plants and seeds that remained after harvesting.

A forest renews after logging: A large amount of trees were chopped down by loggers in order to create building materials. Over time, trees grow in and the area returns to its previous state.

Renewal after disease: A plant population can be very negatively affected by a variety of infectious plant diseases. If the entire population dies, but the soil and roots remain, it is possible for secondary succession to occur and for the population of those plants to return.

A flood can ruin farmlands. However, because the soil remains after the waters recede, over the course of many years a natural secondary succession can occur and the vegetation that had previously grown there can grow again.

Plants can be very susceptible to attack from pests, particularly if there is an overpopulation of those pests. When this occurs, the plant population in one area can be completely destroyed. However, when the pest overpopulation is resolved, the plants are able to live again and thrive in the soil in which they previously had lived.

**5. Solution: 3**

**Explanation:**

More oxygen will generate more free radical that will exacerbate the aging process through Oxidative Stress. Oxidative Stress will interfere in numerous cellular processes like protein production, DNA replication etc. Hence age will get reduced.

Immune system will get a boost as a result of oxidation and hence will help in fighting diseases (Less sickness)

Many insects rely on gaseous diffusion for respiration therefore the maximum body size depends on the proportion of oxygen gas in the atmosphere. Hence size of insects will increase.

Oxygen-enriched air improves engine performance by producing hotter reactions and reducing the proportion of nitrogen, which reduces heat transfer and hence will give better mileage.

**6. Solution: 4**

**Explanation:**

The Ecological Footprint is a resource accounting tool that measures how much biologically productive land and sea is used by a given population or activity, and compares this to how much land and sea is available. Productive land and sea areas support human demands for food, fibre, timber, energy, and space for infrastructure. These areas also absorb the waste products from the human economy. The Ecological Footprint measures the sum of these areas, wherever they physically occur on the planet. The Ecological Footprint is used widely as a management and communication tool by governments, businesses, educational institutions, and non-governmental organizations.

Ecological Footprint accounts answer a specific research question: how much of the biological capacity of the planet is demanded by a given human activity or population? To answer this question, the Ecological Footprint measures the amount of biologically productive land and water area an individual, a city, a country, a region, or all of humanity uses to produce the resources it

consumes and to absorb the waste it generates with today's technology and resource management practices. This demand on the biosphere can be compared to biocapacity, a measure of the amount of biologically productive land and water available for human use. Biologically productive land includes areas such as cropland, forest, and fishing grounds, and excludes deserts, glaciers, and the open ocean

Ecological Footprints can be calculated for individual people, groups of people (such as a nation), and activities (such as manufacturing a product).

The Ecological Footprint of a person is calculated by considering all of the biological materials consumed, and all of the biological wastes generated, by that person in a given year. These materials and wastes each demand ecologically productive areas, such as cropland to grow potatoes, or forest to sequester fossil carbon dioxide emissions. All of these materials and wastes are then individually translated into an equivalent number of global hectares.

#### **7. Solution: 4**

##### **Explanation:**

A mutualistic relationship is when two organisms of different species "work together," each benefiting from the relationship. In mycorrhizal associations between plant roots and fungi with the plant providing carbohydrates to the fungus in return for primarily phosphate but also nitrogenous compounds.

Other examples include rhizobia bacteria that fix nitrogen for leguminous plants in return for energy-containing carbohydrates

Pollination in which nectar or pollen (food resources) are traded for pollen dispersal (a service) or ant protection of aphids, where the aphids trade sugar-rich honeydew (a by-product of their mode of feeding on plant sap) in return for defense against predators such as ladybugs.

Zoochory is an example where animals disperse the seeds of plants. This is similar to pollination in that the plant produces food resources (for example, fleshy fruit, overabundance of seeds) for animals that disperse the seeds (service).

The bacteria and the human. A certain kind of bacteria lives in the intestines of humans and many other animals. The human cannot digest all of the food that it eats. The bacteria eat

the food that the human cannot digest and partially digest it, allowing the human to finish the job. The bacteria benefit by getting food, and the human benefits by being able to digest the food it eats.

**8. Solution: 4**

All are bioluminescent species. Winged Beetles are also called Fireflies. Specific types of bacteria and fungi show this property. The **Bioluminescent Octopus**, scientifically known as: ***Stauroteuthis syrtensis***, is a deep sea species that has been relatively little studied. **Krill** are bioluminescent animals having organs called photophores that can emit light.

**9. Solution: 3, Definition of Ecotone**

**10. Solution: (a)**

**Explanation:**

Zing- Ladakh

Johad- Central India

Kunds- Rajasthan

Surangam- Western Ghats

Kere- Karnataka

**11. Solution- 4**

**Explanation-**

According to Indian State of Forest report 2013

Open Forest- 8.28% of Recorded Forest Area

Moderately dense forest- 33.91%

Plantation/Young crops-7.95

Shifting Cultivation-0.81%

Non-Forestry Plantation-1.22

### 12. Solution- 4

**Explanation-** Excessive erosion of TOP soil, not Bottom soil. Erosion takes place on the top surface of soil. Major forest cover of India has undergone Mild Erosion amounting 63% of RFA. Heavy Soil erosion amounts to 2.24 % of RFA

### 13. Solution- 3

**Explanation-** UPSC asks questions about Vegetative Stem cutting and other such methods. Forest Survey Report has mentioned about Forest regeneration methods.

Silviculture is the practice of controlling the establishment, growth, composition, health, and quality of forests to meet diverse needs and values. The name comes from the Latinsilvi- (forest) + culture (as in growing). The study of forests and woods is termed silvology. Silviculture also focuses on making sure that the treatment(s) of forest stands are used to preserve and to better their productivity.

The taungya is a system whereby villagers and sometimes forest plantation workers are given the right to cultivate agricultural crops during the early stages of forest plantation establishment. Taungya means hill cultivation, it was introduced into-India by Dr. Brandis in 1890 and the first Taungya plantation was raised in 1896 in north Bengal. It is practiced in Kerala, West Bengal, U.P., and to lesser extent in Tamil Nadu, A. P. Orissa and the north eastern hill regions. In southern India the system is called KUMARI; it is practiced in a areas with an assured annual rainfall of over 1200-1500mm.

This is a modified term of shifting cultivation in which labour is permitted to raise crop in an area but only side by side with the forest species planted by them. The practices consist of land preparation, tree planting, growing agricultural crop for 1 to 3 years until shade becomes the dense and then moving on to repeat the cycle in a different area.

### 14. Solution- 3

**Explanation-** First statement is true. Coral bleaching not only happens because of warm temperature but can also happen due to Cold temperature. Not all bleaching events are due to warm water. In January 2010, cold water temperatures in the Florida Keys caused a coral

bleaching event that resulted in some coral death. Water temperatures dropped 12.06 degrees Fahrenheit lower than the typical temperatures observed at this time of year. Researchers will evaluate if this cold-stress event will make corals more susceptible to disease in the same way that warmer waters impact corals.

When a coral bleaches, it is not dead. Corals can survive a bleaching event, but they are under more stress and are subject to mortality.

**15. Solution- 4**

Explanation- The leafy part is used as vegetables. The root is used as Medicine.

For more-

<http://timesofindia.indiatimes.com/home/science/Indian-scientists-find-a-wonder-herb-in-the-high-Himalayas/articleshow/40869492.cms>

**16. Solution- 4**

Explanation- The definition given is of Joint Implementation but India cannot be its beneficiary since it applies among Annex 1 countries only. CDM applies to developing countries.

**17. Solution- 4**

Explanation- The Bio-safety protocol is Cartagena not Nagoya. Rest are correct

**18. Solution- 2**

Self explained

**19. Solution- 3**

Except fourth statement, all are correct.

<https://en.wikipedia.org/wiki/Bioasphalt>

<http://thegreenenergyblog.com/uncategorized/bioasphalt-renewable-construction-material-2>

**20. Solution- 4**

**Explanation-** Oil eating bacteria is an aerobic bacterium. The genetic name Pseudomonas created for organisms like oil eating bacteria was

<http://scienceblogs.com/oscillator/2010/06/08/oil-eating-bacteria/>

**21. Solution: 4**

The body contour is cylindrical, spindle-shaped, or fusiform (e.g., earthworms, moles, badgers) so as to reduce resistance in subterranean passage.

**22. Solution: 4**

**23. Solution: 2**

Wetland soils also contain sulfur-loving archaea, which are single-celled organisms that use sulfur for energy production. They compete with the methane producing microbes. In areas where there is a significant amount of acid rain, scientists have shown that these sulfur archaea out-compete the methane-producing microbes, thereby decreasing the methane output in these areas significantly.

**24. Solution: 2**

Oil spill can prove fatal for plant, animal and human life. The substance is so toxic that it can cause massive loss of species (food web will get simplify) that live in the sea. Oil spill

penetrates into the plumage and fur of birds, breaks down the insulating capabilities of feather which makes them heavier, disallow them to fly and kill them via poisoning or hypothermia.

<http://www.conserve-energy-future.com/effects-of-oil-spills.php>

**25. Solution: 3**

**26. Solution: 2**

Predators or pests are important biotic components of the ecosystem. Natural predators make the prey population stronger by removing weak members of the prey population but human beings generally remove the strongest specimens. Captive breeding is for conservation of troubled species ( a measure to safeguard wildlife)

**27. Solution: 1**

Dr. Pramod Patil was awarded for his work to protect great Indian bustard.

**28. Solution: 4**

**Black Carbon:** - emitted mainly by high-temperature combustion processes (diesel engines, etc.) give way to more green house effect

**Brown Carbon:** - emitted mainly by biomass combustion

**Green Carbon:** - Carbon used by the plants for photosynthetic activities

**Blue Carbons:** - it refers to carbon that is held by coastal and marine vegetation (it also includes carbon held by marine organism and sediments)

**29. Solution: 1**

Addition of iron particles to sea or ocean results into growth of phytoplankton as they prefer iron. Phytoplankton role in absorbing carbon dioxide from atmosphere has been

documented in various research works. Sea surface temperature will fall as atmosphere will witness decrease in carbon dioxide in atmosphere. Addition of iron particles is geo-engineering process. It has been suggested by many experts to control the menace of global warming with other ways like artificial trees, parasol etc.

**30. Solution: 3**

Hyogo framework of action is related to disaster risk management. It talks about developing resilient ecosystem. Standing mangroves forests act as resilient wall for tsunami. These forests have a complicated network of tree arrangement that, to good extent help in resisting the entry of waves from ocean.

[http://www.ramsar.org/sites/default/files/documents/pdf/moc/CBD-Ramsar5thJWP\\_2011-2020.pdf](http://www.ramsar.org/sites/default/files/documents/pdf/moc/CBD-Ramsar5thJWP_2011-2020.pdf)

**31. Solution- 4**

**Other categories include**

- Sustainable Architecture and Design
- Building Materials and Resources
- Indoor Environmental Quality

**32. Solution- 3**

Canary birds were recently relieved from being used as an early warning system in coal mines. With the advent of a range of portable electronic toxic gas detectors, the canaries are now set free and relieved from the dangerous job that they had been doing in the coalmines of the Kothagudem region of Singareni Collieries Company Ltd. With the company introducing state-of-the-art handheld gas detectors with sensors and alarm systems for

deep excavation, the birds are no longer called in to play the role of an early-warning system for carbon monoxide and other toxic gases in the mines.

**The reasons for their use was-** The rapid breathing rate, small size and high metabolism of the canaries make them die before miners do on inhaling toxic gases. The men can then be quickly evacuated. The canaries used to be carried in cages and miners had to look for distress signs in the birds

### 33. Solution- 1

There are several reasons for this. **First, the mountain topography in Karnataka is broader than the narrow topography of the Ghats in Maharashtra.** Due to the greater width of the mountains, the rain bearing winds have to necessarily travel a longer distance and have more time for the drops to coalesce and precipitate as rainfall, resulting in higher rainfall. In contrast, the narrow width of the Ghats in Maharashtra allows the rain-bearing wind to cross over to the leeward side rapidly before precipitation can occur. As for Kerala, the Ghats there are in the form of isolated mountains, where the rain-bearing winds can easily cross over to the leeward side through the gaps in between without precipitation occurring.

Second, the slope of the mountain has a direct bearing on the possibility of precipitation. This is borne out by the Ghats of Karnataka where the mountains are gently sloping, compared to the steep slopes of the Ghats in Maharashtra and Kerala.

The air parcel will retain its energy and speed for a longer time when the slope is gradual. This will provide sufficient vertical motion to cloud droplets to grow by collision-coalescence process and hence form precipitation.

Third, the gentle slope provides a greater area for sunlight absorption and heating leading to greater convection when compared with an abrupt slope i.e. less Ghat area such as that of the Maharashtra and Kerala Ghats.

Fourth, the continuous mountain range presents a greater barrier to rain-bearing winds than a range comprising isolated mountains with gaps in between where the winds can easily pass to the leeward side. Unlike in the case of Kerala, the Ghats in Maharashtra and Karnataka are continuous

**34. Solution- 3**

**35. Solution- 2**

Biosequestration is the capture and storage of the atmospheric greenhouse gas carbon dioxide by biological processes. (Natural). Second statement is right.

**36. Solution: 3**

Very heavy rainfall is not responsible for floods in Punjab-Haryana zone

**37. Solution: 4**

Warning coloration adaptation appears to avoid the mistake encounter of dangerous animals in general, or the encounter of unpalatable organisms by predators. The animals bear this coloration to advertise their being dangerous or unpalatable. Gila monster the only known poisonous lizard has bright black, brown yellow and orange bands. Most poisonous snakes possess warning coloration.

**38. Solution: 3**

Capillary mechanism has nothing to do with humus.

**39. Solution: 3**

**40. Solution: 3**

Nutrient loading will decrease if excess use of fertilizer is checked. Excess use of fertilizer results into salt encrustation impeding infiltration so locally, inundation is witnessed.

**41. Solution: 3**

Low Carbon economy has been emphasized to achieve green economy. Carbon free economy is all most impossible to achieve by Human.

**42. Solution: 4**

They can penetrate the animal cells and plant cells. Research has established the veracity of the facts that Nano particles have great impacts on human immune system.

<http://www.azonano.com/article.aspx?ArticleID=3138>

**43. Solution- 1**

We have already a huge area cover under rice and wheat and it's no way helping us in securing nutritional security.

**44. Solution: 4**

Skin of most aquatic forms is rich in mucous glands to make it slippery that serve the purpose of avoiding friction with environment.

They have a fatty layer below the skin known as bubbler. Besides insulating the body, it also helps in flotation.

The hollow outgrowth of the alimentary canal, called air bladder, functions as an organ of flotation

**45. Solution: 2**

Read International Monetary Fund (IMF) recent report titled Act Local, Solve Global China stands at first position.

**46. Solution: 3**

**47. Solution- 4**

Champions of the Earth- UNEP

Clean Technology Award- Rajiv Gandhi Environment Awards

Goldman Environmental Prize- Activists

**48. Solution- 3**

<http://www.smh.com.au/environment/conservation/31-species-of-migratory-animals-given-un-protection-20141110-11js7y.html>

**49. Solution- 4**

IYB-chapter 4

**50. Solution- 1**

India is second largest producer of fish in the world- IYB

**51. Solution- 4**

Viticulture- Grapes

Floriculture- Flowers

Oenology- Making of wines

Pomology- pome fruits

**52. Solution- 2**

The direct heat generated by burning biomass is significant, and contributes to cloud evaporation by decreasing relative humidity

<http://news.stanford.edu/news/2014/july/biomass-burning-climate-073114.html>

<http://www.thehindu.com/sci-tech/energy-and-environment/emissions-from-biomass-burning-cross-the-himalayas/article7105899.ece>

**53. Solution- 3**

<http://timesofindia.indiatimes.com/home/environment/pollution/80-of-Indias-surface-water-may-be-polluted-report-by-international-body-says/articleshow/47848532.cms>

**54. Solution- 2**

India has Project Tiger not Operation Tiger :D

**55. Solution- 1**

**56. Solution- 1, Vaquita**

<http://www.downtoearth.org.in/content/population-world-s-smallest-porpoise-dwindles-97>

**57. Solution- 2**

<http://www.climatecentral.org/news/global-warming-atmospheric-rivers-18645>

**58. Solution- 4**

<http://pib.nic.in/newsite/efeatures.aspx?relid=105411>

**59. Solution- 3**

Carbon Sink is part of CDM

<http://www.sinkswatch.org/kyoto.html>

**60. Solution- 3**

Cancun and Copenhagen are right

**Durban Declaration and Programme of Action-** The DDPA reasserts the principles of equality and non-discrimination as core human rights, thus transforming victims of discrimination into rights-holders and States into duty bearers.

**Bali Action Plan-** The Bali Action Plan did not introduce binding commitments to reduce greenhouse gas emissions but included the request for developed countries to contribute to the mitigation of global warming in the context of sustainable development. In addition, the Bali Action Plan envisaged enhanced actions on adaptation, technology development and on the provision financial resources, as well as measures against deforestation.

#### 61. Solution- 4

The Stockholm Convention was adopted and put into practice by the United Nations Environment Programme (UNEP) on May 22, 2001. The UNEP decided that POP regulation needed to be addressed globally for the future. The purpose statement of the agreement is "to protect human health and the environment from persistent organic pollutants.

The Aarhus Protocol on Persistent Organic Pollutants, a 1998 protocol on persistent organic pollutants (POPs), is an addition to the 1979 Geneva Convention on Long-Range Transboundary Air Pollution (LRTAP)

LRTAP includes POP compounds like Aldrin, Chlordane and hexachlorobenzene etc

#### 62. Solution- 3

Sea spray refers to aerosol particles that are formed directly from the ocean. Sea spray is a form of Particulate Matter. Elementary carbon is also known as Black Carbon-a PM. So, all of the above are chief pollutants under AQI

#### 63. Solution- 4

All are used in Superior water filtration.

**Silver-** leaches in water and when the ions so released kill the bacteria by destroying the integrity of the cell and by damaging the cell proteins and terminating the DNA replication.

**Titanium oxide-** also kills bacteria. Though its antibacterial property is best in the presence of UV light, the present study did not use UV light.

**Carbon Nanotubes-** kill the bacteria through direct physical contact—and the roughness of the nanotubes also kills the bacteria.

**64. Solution- 4**

There are primarily two kinds of raptors — diurnal (day flying) and nocturnal (night flying). Out of the 333 species of diurnal birds of prey found in the world, 101 species can be found in the Indo-Malayan region. India's bio-geographical regions support 69 species of kites, vultures, eagles, harriers, hawks, buzzards and falcons in different habitats.

Among these raptors, the Indian White-backed Vulture, the Long Billed Vulture, the Slender Billed Vulture, the Red headed Vulture and the Forest Owlet are in the 'critically endangered' category, and the Egyptian Vulture and the Saker are in the 'endangered' list of the International Union for Conservation of Nature's (IUCN) 'Red List.'

Some of the interesting and lesser-known species of raptors include Andaman Serpent Eagle and Great Nicobar Serpent Eagle which can only be found in the Andaman and the Great Nicobar islands respectively.

Other birds of prey like Amur Falcon, Buffy Fish Owl, Great Spotted Eagle and Chinese Sparrow hawk are also included in the book.

**Found in India- Don't argue that Amur Falcon is a migratory bird so not found in India. Found doesn't mean Naturally Found 😊**

**65. Solution- 1**

<http://www.thehindu.com/news/cities/Tiruchirapalli/darbha-grass-a-natural-preservative/article7000098.ece>

**66. Solution- 4**

All of the above phenomenons are responsible for the formation of FOG

**67. Solution- 3**

There are only two major pathways of natural nitrogen fixation and they are lightening and by bacteria and blue green algae

**68. Solution- 4**

Besides trapping smog, inversions also trap sound waves. Because of this, the loud sounds of things like airplanes taking off will seem louder as the sound waves refract off the inversion layer and back down to the ground.

But sound waves aren't the only thing that gets refracted by weather inversions. Light can be bent by the inconsistency of the temperature. When an inversion is not present, but the ground temperature is significantly hotter than the air higher up like in the desert, the bending of light causes mirages in the form of thinking that there is a lake or puddle up ahead. Really, it is the sky reflecting off of the ground because of the extreme change in temperature

When there is a temperature inversion, the affect is just the opposite. If the inversion is strong enough, it can cause far off objects to look like they are floating above the ground. If things are far enough they are past the curvature of the earth, they may become visible. This reverse or "superior" mirage is called looming.

Very high frequency radio waves can be refracted by inversions, making it possible to hear FM radio or watch VHF low-band television broadcasts from long distances on foggy nights. The signal, which would normally be refracted up and away from the ground-based antenna, is instead refracted down towards the earth by the temperature-inversion boundary layer. This phenomenon is called tropospheric ducting.

**69. Solution- 2**

CO, VOCs and NO are called Ozone precursors. VOCs include methane also.

**70. Solution- 3**

PSC enhances the depletion of ozone because they support chemical reactions that produce reactive chlorine molecules which catalyzes ozone destruction. Ozone depletion means more UV rays coming on earth and it will actually enhance the formation of Vitamin D. Third statement is correct.

**71. Solution- 1**

Sulphur is not present in the formation of Photochemical smog

**72. Solution- 1**

CFCs releases chlorine atoms (radicals) that are responsible the chain reaction leading to formation of oxygen thereby inhibiting the concentration of ozone

**73. Solution- 1**

**74. Solution- 2**

**75. Solution- 3**

**76. Solution- 1**

All of them are correct

**77. Solution- 2**

The by-product is water and heat not carbon dioxide.

**78. Solution- 1**

The major problem in Coal Gasification is the production of more Carbon Dioxide. This was recently in news due to China's aggressive use of this technology that is good for local environment but globally the China will be adding more CO<sub>2</sub>.

**79. Solution- 1**

Sulphur dioxide is not a constituent of syngas and nitrogen is an impurity

**80. Solution- 4**

Maharashtra has maximum number of Tiger Reserves according to the website of NTCA

[http://projecttiger.nic.in/content/109\\_1\\_ListofTigerReservesCoreBufferAreas.aspx](http://projecttiger.nic.in/content/109_1_ListofTigerReservesCoreBufferAreas.aspx)

Bor Wildlife Sanctuary is in Maharashtra

Recently Rajajai National Park is awarded the status of Tiger reserve. It is in Uttarakhand

**81. Solution- 1**

The Keibul Lamjao, the only floating national park in the world, is home to the last of the brow-antlered deer (*Rucervus eldii eldii*), one of the most endangered deer in the world. It is located near Loktak Lake of Manipur, India

**82. Solution- 4**

India has more wildlife sanctuaries. Wildlife sanctuaries can be upgraded to National Park but vice versa is not allowed.

**83. Solution- 3**

Olive Ridley turtle is in news for quite sometimes. So this question

**84. Solution- 2**

Coral triangle is an initiative of WWF. The Coral Triangle, the global centre of marine biodiversity, is a 6 million km<sup>2</sup> area spanning Indonesia, Malaysia, the Philippines, Papua New Guinea, Timor Leste and the Solomon Islands.

**85. Solution- 4**

**86. Solution- 2**

A deciduous forest is one where the leaves fall from the trees in autumn. Deciduous means "falling out or off at a certain season". The average temperature is 50 degrees and the average rainfall is 30 to 60 inches per year. These forests are located in the temperate zone above the tropical forests and below the coniferous forests. These forests have their own specific plants, trees, animals, and shrubs. Deciduous forests are found in the eastern part of North America and the middle of Europe. Asia, southwest Russia, Japan, and eastern

China also have these forests. All of the deciduous forests in America are second growth. This means all the original trees have been cut and the forests have grown from seeds and seedlings. Both China and Europe have cleared all of their first growth deciduous forests for agriculture. All of the deciduous forests in Europe and China are man-made.

**87. Solution- 3**

Its wood is not aromatic. It is endemic to Southern Eastern Ghats Mountain range of South India

**88. Solution- 4**

While only 7 per cent of e-waste last year was made up of mobile phones, calculators, personal computers, printers, and small information technology equipment, almost 60 per cent was a mix of large and small equipment used in homes and businesses, such as vacuum cleaners, toasters, electric shavers, video cameras, washing machines, electric stoves, mobile phones, calculators, personal computers, and lamps.

The lowest amount of e-waste per inhabitant was generated in Africa (1.7 kg/inhabitant). The continent generated 1.9 Mt of e-waste in total.

**89. Solution- 1**

You may have seen 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.

**90. Solution- 2**

Greater the BOD more is the polluting potential. Actually, in secondary treatment or biological treatment of sewage water in plant, the primary effluent is passed into large aeration tanks where it is constantly agitated mechanically and air is pumped into it. This allows vigorous growth of useful aerobic microbes into flocs (masses of bacteria associated with fungal filaments to form mesh like structures). While growing, these microbes consume the major part of the organic matter in the effluent. This significantly reduces the BOD (biochemical oxygen demand) of the effluent. BOD refers to the amount of the oxygen that would be consumed if all the organic matter in one litre of water were oxidised by bacteria. The sewage water is treated till the BOD is reduced.

**91. Solution- 1**

Chapter 10, Bio-12<sup>th</sup>

**92. Solution- 1**

2 and 5 are denitrifying bacteria and rest are nitrogen fixing organism

NCERT- BIO, class 12<sup>th</sup>, chapter 10

**93. Solution- 4**

They are common in wetlands, where they are responsible for marsh gas, and in the digestive tracts of animals such as ruminants and humans, where they are responsible for the methane content of belching in ruminants and flatulence in humans.

Moreover, the methanogenic archaea populations play an indispensable role in anaerobic wastewater treatments. They are anaerobic organisms and cannot function under aerobic conditions. NCERT- BIO-12<sup>th</sup>, Chapter 10

**94. Solution- 2**

Lady bird and Butterflies are used to get rid of Aphids. Fungi are also known to form symbiotic associations with plants (mycorrhiza). Many members of the genus Glomus form mycorrhiza. A biological control being developed for use in the treatment of plant disease is the fungus Trichoderma. Trichoderma species are free-living fungi that are very common in the root ecosystems. They are effective biocontrol agents of several plant pathogens. Methanobacterium is related to Biogas

**95. Solution- 1**

NCERT-Bio-12<sup>th</sup>, chapter 9

**96. Solution- 3**

This is the practice of mating of animals within the same breed, but having no common ancestors on either side of their pedigree up to 4-6 generations. The offspring of such a mating is known as an out-cross. It is the best breeding method for animals that are below average in productivity in milk production, growth rate in beef cattle, etc.

NCERT-Bio-12<sup>th</sup>, chapter 9

**97. Solution- 3**

Black rot is caused by a bacteria, *Xanthomonas campestris* pv. *campestris*, that can infect most crucifer crops at any growth stage. This disease is difficult for growers to manage and is considered the most serious disease of crucifer crops worldwide

**98. Solution- 2**

They contribute to GHGs

**99. Solution- 1**

**100. Solution- 1**

The release of heated water into the aquatic bodies changes the average water temperature and concentration of dissolved oxygen. Elevated temperature decreases the level of dissolved oxygen in water which is harmful to aquatic animals like fishes, amphibians and other aquatic organisms. High temperature limits oxygen dispersion into deeper waters, leading to anaerobic conditions. It can lead to increased bacterial population. Several

aquatic species fail to reproduce at elevated temperature. The eggs of trout fail to hatch while salmon does not spawn as higher temperature. Thermal pollution may also increase the metabolic rate of aquatic animals, as enzyme activity, resulting in these organisms consuming more food in a shorter time. An increased metabolic rate may result in fewer resources causing a sharp decrease in a population.

A large increase in temperature can lead to the denaturation of enzymes. Decreased enzyme activity in aquatic organisms can cause problems such as the inability to break down fats, which leads to malnutrition

**101. Solution- 3**

It is listed as Critically Endangered and endemic to Western Ghats

<http://www.sciencelog.net/2015/06/copal-tree8.html>

**102. Solution- 1**

NCERT- Bio, Class 12<sup>th</sup>

**103. Solution- 3**

These early years are marked by swirling oceans of hot magma that no longer exists today on any planet in our solar system. Extreme volcanism in Earth's early history occurred in response to this energetic motion of then-molten mantle material. As planetary material violently overturned, volatile gases from the interior, especially Carbon dioxide (CO<sub>2</sub>), Carbon monoxide (CO), Hydrogen (H<sub>2</sub>), Nitrogen (N<sub>2</sub>) and water vapor (H<sub>2</sub>O), were released, and accumulated in a gaseous surface layer that was trapped by gravitational forces. Radiation from the nearby Sun swept lighter gases as H and He away, leaving only heavier molecules in this early atmosphere. Chemical reactions in the hot surface layer formed other simple atmospheric compounds, such as methane (CH<sub>4</sub>) and ammonia (NH<sub>3</sub>).

While far less abundant, the latter compounds are highlighted as they are key components of amino acids, which are the fundamental building blocks of life's proteins. Note also that Oxygen (O<sub>2</sub>), key to the survival of many forms of modern life, was not present in the early atmosphere.

**104. Solution- 4**

Suspended solids are removed in the first step because of its bigger size.

**105. Solution- 3**

Lowered resistance to environmental perturbations such as drought and increased variability in certain ecosystem processes such as plant productivity, water use, and pest and disease cycles

NCERT- 12<sup>th</sup> Bio- Chapter 14

**106. Solution- 4**

Occurrence- Cool Humid climate

Mixture of smoke, fog and SO<sub>2</sub>

It is reducing mixture so called as Reducing Smog

NCERT- 11<sup>th</sup> Chemistry, chapter 14

**107. Solution- 2**

**108. Solution- 3**

Supervolcanoes represent the second most globally cataclysmic event – next to an asteroid strike – and they have been responsible in the past for mass extinctions, long-term changes to the climate and shorter-term “volcanic winters” caused by volcanic ash cutting out the sunlight.

**109. Solution- 2**

CFC will react to give excited chlorine radical and will be consumed in the reaction and hence its concentration will be decreased. While ozone will split into more oxygen molecules and it will be reduced.

**110. Solution- 4**

<http://water.epa.gov/type/wetlands/swamp.cfm>

<http://www.thehindu.com/sci-tech/energy-and-environment/myristica-swamps-a-vanishing-ecosystem-in-western-ghats/article3512630.ece>

**111. Solution- 2**

[http://www.thehindu.com/sci-tech/energy-and-environment/indian-deltas-are-sinking/article5892566.ece?utm\\_source=MostPopular&utm\\_medium=Environment&utm\\_campaign=WidgetPromo](http://www.thehindu.com/sci-tech/energy-and-environment/indian-deltas-are-sinking/article5892566.ece?utm_source=MostPopular&utm_medium=Environment&utm_campaign=WidgetPromo)

**112. Solution- 3**

**113. Solution- 1**

Mammals have milk producing glands. Most mammals are viviparous, giving birth to live young. However, the five species of monotreme, the platypuses and the echidnas, lay eggs.

**114. Solution- 2**

Melting of ice will actually increase Earth's temperature

<http://www.livescience.com/48099-antarctica-melting-earth-gravity-changes.html>

**115. Solution- 2**

They are not biological agents. According to an International Committee of the Red Cross review of the Biological Weapons Convention, "Toxins are poisonous products of organisms; unlike biological agents, they are inanimate and not capable of reproducing themselves", and "Since the signing of the Convention, there have been no disputes among the parties regarding the definition of biological agents or toxins". Toxin is a poisonous substance produced within living cells or organisms, synthetic toxicants created by artificial processes are thus excluded.

**116. Solution- 4**

Transpiration is low to maintain water loss. The plant species using the pathways have a high rate of carbohydrate assimilation for given stomatal opening higher temperature & light optimum.

The water uptake by plants is increased efficiently due to following plant characteristics.

**Efficient root system:**

- i) Extensive root system
- ii) Deeper root system
- iii) Secondary root etc.
- iv) Ability of roots to go towards available water
- v) Ability of roots to penetrate in soil

Rolling or curling of the leaves reduces the leaf surface exposed to sunlight thus helps in reducing the transpiration loss under stress conditions.

**117. Solution- 1**

**The nine tipping elements are**

1. Melting of Arctic sea-ice (approx 10 years)
2. Decay of the Greenland ice sheet (more than 300 years)
3. Collapse of the West Antarctic ice sheet (more than 300 years)
4. Collapse of the Atlantic thermohaline circulation (approx 100 years)
5. Increase in the El Nino Southern Oscillation (approx 100 years)
6. Collapse of the Indian summer monsoon (approx 1 year)
7. Greening of the Sahara/Sahel and disruption of the West African monsoon (approx 10 years)
8. Dieback of the Amazon rainforest (approx 50 years)
9. Dieback of the Boreal Forest (approx 50 years)

**118. Solution- 3**

Lead is a metal. Lead production is deficient hence import. Last two sentences are correct.

**119. Solution- 4**

Invert the statements

There are two main differences in the way that LPG (Propane) and natural gas (Methane) are burnt. The first difference is in the energy content.

LPG has a higher calorific value, or energy content, so less gas is required to produce the same amount of heat. LPG Needs More Oxygen. The second difference is in the oxygen to gas ratio required for proper combustion. LPG requires oxygen to gas ratio of approximately 25 to 1. Natural gas requires a ratio of around 10 to 1.

**120. Solution- 4**

Fission gives Chain reactions not Fusion. Fusion requires tremendous energy to combine the H-nuclei. Controlling the Fusion (High Energy production) is a major problem in Fusion Research. So, un-stable due to high energy generation.

**121. Solution- 3**

Pitcher and Tendrils are Modified Leaves

**122. Solution- 3**

Wetlands are among the most diverse and productive ecosystems. They provide essential services and supply all our fresh water. However they continue to be degraded and converted to other uses.

The Convention uses a broad definition of wetlands. It includes all lakes and rivers, underground aquifers, swamps and marshes, wet grasslands, peatlands, oases, estuaries, deltas and tidal flats, mangroves and other coastal areas, coral reefs, and all human-made sites such as fish ponds, rice paddies, reservoirs and salt pans.

**123. Solution- 4**

<http://www.wetlands.org/Whatarewetlands/Peatlands/Carbonemissionsfrompeatlands/tabid/2738/Default.aspx>

Although wetlands act as natural buffers towards nutrients expelled from surrounding watersheds, excess nutrients mainly through anthropogenic sources have been shown to significantly increase the N<sub>2</sub>O fluxes from their soils through de-nitrification and nitrification processes.

**124. Solution- 4**

Third statement is wrong. More than six categories are included in IUCN Red List. If first statement is correct, obviously second will be wrong ☺

<http://www.iucnredlist.org/about/introduction>

**125. Solution- 3**

Option 2 and 5 are exchanged to baffle you ☺

**126. Solution- 2**

Except Rattle Snake all are found in India.

**127. Solution- 2**

Carbon Monoxide is an unstable gas and doesn't last long to heat.

**128. Solution- 4**

Temperate- Walnut and Plums

Rest are- Tropical

**129. Solution- 3**

**130. Solution- 4**

HFC's are non- ozone depleting and that is why CFC's were phased out and HFCs were used as refrigerant. HFCs have high potential for Global warming.

**131. Solution- 3**

**132. Solution- 4**

UNWWDR- UNESCO, 2015- Water for a Sustainable World, 2014- Water and Energy

**133. Solution- 1**

**134. Solution- 1**

They complement other fertilizers and never replace them.

**135. Solution- 1**

It's Ionosphere- Extension of Thermosphere ☺

**136. Solution- 2**

Bug- 3 pairs

Scorpion- 4 pairs

Mite- 4 pairs

Lobster- 5 pairs

**137. Solution- 1**

There are 17 NTD under WHO. Try to remember them as they are time and again in news.

**138. Solution- 4**

Yes it can be done in plants as well as animals. But in plants, as all the plants are genetically similar, there is reduction in genetic diversity. As genetic profile will remain same so susceptibility towards environment and pests will not decrease. It will be equal to parent species. More and more crops can be created from one plant so great scope for combating hunger.

**139. Solution- 3**

**140. Solution- 4**

**141. Solution- 3**