19. Organisms and Environment - II

19.1 : Population and Ecological Adaptation

Q.1. Define i) Population. ii) Community iii) Adaptation.

Ans: i) Population: A group of individuals belonging to the same species within an ecosystem is called a population.

ii) Community: The population of the different species that live and interact together in the ecosystem are referred to as community.

iii) Adaptation: Adaptation is the adjustment made by an organism to the changing environment.

Q.2. Explain the cursorial adaptation.

Ans:i) Cursorial adaptations are the adaptation for running.

ii) It helps the animal to escape easily from its enemy.

iii) Cockroaches show presence of three pairs of long thoracic legs.

iv) The legs show presence of claws and adhesive pads which help in running.

Q.3. Enlist the arboreal adaptation.

Ans:i) Arboreal adaptations are seen in animals living on trees.

ii) The hind limbs in arboreal animals are provided with longer toes useful in swinging on branches.

iii) The body is provided with long prehensile tail for balancing.

Q.4. Write a note on desert adaptations. [Mar 2014]

OR

Mention the adaptations shown by camels.

Ans:i) Desert adaptations are adaptations for survival in the desert.

ii) These adaptations can be explained with the example of camel.

iii) In camel minimum water is lost through urine.

iv) Water is stored in the muscles, water cells of stomach and connective tissues of the hump.

v) Nephrons with longer loop of Henle for more reabsorption of water.

Q.5. Which adaptations are shown by Labeo?

Ans: i) In Labeo body is streamlined

ii) Body is covered with scales for protection.

iii) They are provided with gills for respiration.

iv) Labeo has fins for locomotion.

v) Presence oflateralline.

Q.6. Why only left ovary and oviduct are present in birds ? [Oct 2013]

Ans: Only left ovary and oviduct are present in birds to reduce body weight and is an adaptation for flying.

Q.7. Explain the volant adaptation shown by birds.

Ans:i) In birds, the forelimbs are modified into wings.

ii) They possess spindle-shaped body with hollow, pneumatic or spongy bones.

iii) Only left ovary and oviduct are present to reduce weight.

iv) Body is covered by feathers to facilitate flying.

Q.8. Describe adaptation for burrowing.

Ans:i) The forelimbs are strong and stout in burrowing animals.

ii) They are provided with claws which are useful in digging.

iii) They have a pointed, elongated snout which is also used in digging.

19.2 : Population Interactions

Q.9. Define competition. Which are the types of competition ?

Ans:i) Competition is an interaction between two or more organisms for obtaining the same resources, which adversely affect them.

ii) There are two types of competition
a) Intraspecific b) Interspecific

a) Intraspecific :
Competition between the individuals of same species is called intraspecific competition. It involves two or more population beloging to same trophic level. By the mechanism of competition it can be classified in following :

a) **Interferece competition :** It occurs between the individuals, where one individual prevent the survival, reproduction of the other, preventing their establishment in a portion of the habitat.

b) Exploitation competition : It occurs indirectly where organisms complete for a common resource or place

c) Apparent competition : It occurs indirectly between two species which have a common prey.

Q.10.Why is intraspeclflc competition more severe ?

Ans: Intraspecific competition' is more acute than interspecific because all competing members share same resource.

Q.ll. Who put forth competitive exclusion principle? What was concluded in theory ?

Ans: Gause put forth competitive exclusion principle. He concluded in theory that two closely related species competing for the same resources cannot co exist definitely and competitively interior one will be eliminated eventually.

Q.12. What is mutualism? Explain with two examples.

Ans: i) Mutualism is an interaction or relationship between two organisms of different species where both the partners are benefited.

ii) Lichen is a relationship between alga and fungus. Alga the performs photosynthesis whereas fungus absorbs moisture.

iii) Ungulates having cellulase secreting bacteria is another example of mutualism. Cellulase produced by the bacteria facilitates the digestion in ungulates. Bacteria get nutrients from ungulate animals.

Q.13. Define the following terms and give one example for each :

i) Commensalism [Mar 2013]
ii) Parasitism
iii) Mutualism

Ans:i) Commensalism:
Commensalism is an interspecific interaction in which one species is benefited and the other one is neither benefited nor harmed.

e.g. a) An orchid plant growing as an epiphyte on a mango tree. In this the orchid plant is benefited (gets its shelter), while the mango tree is neither benefited nor harmed.

b) The cattle egret and grazing cattle are in close association ;
The egrets forage close to where the cattle are grazing because as the cattle move, they stir up and flush out from the vegetation the insects that otherwise might be difficult for the egrets to find and catch (the egrets are benefited and the cattle are unaffected)

ii) Parasitism :
Parasitism is an interspecific interaction in which one of the species (parasite) is benefited while the other one (host) is harmed (may even be killed).

e.g. a) Tapeworm/roundworm in human intestine; the worms are benefited while the human " being is harmed.

b) Cuscuta is a parasitic plant growing on the hedge plants; it has .no leaves and no chlorophyll and feeds on the hedge plants.

iii) Mutualism :
Mutualism is the interspecific interaction, where both the interacting species are mutually or equally benefited their association is obligatory.

e.g. a) Mycorrhiza, which is relationship between plants and fungi. More 'than 48% of land plants rely on mycorrhizal relationships where fungi provide them with inorganic compounds.

Q.14. What was the main statement of Darwin's theory ?

Ans: "Survival of the fittest" was the main statement of Darwin's theory.

Q.15. Explain the commensalism between the shark and *Remora* and *Echenis fish.*

Ans:i) Sucker fish attaches to the under surface of the shark with help of its dorsal fineacts as a holdfast)

and gets a free ride.

ii) It detaches itself when later feeding to obtain the fallen smaller pieces of the food.

iii) Pilot fish always accompanies shark without getting attached to it.

iv) It feeds on falling pieces of food.

Q.16. Write about commensalism.

Ans: *Refer Q.13. i*

Q.17. Hermit crab and sea anemone shows which kind of relationship? Explain.

Ans:i) Sea anemone and hermit crab exhibit mutualism. In mutualism both the partners are benefitted.

ii) Sea anemone is found attached to Snails shell which is used as a portable home by hermit crab. Sea anemone is carried from place to place by the moving crab and is benefitted by getting more opportunities of food.

iii) In this relationship sea anemone gets the benefit of locomotion whereas hermit crab receives the benefit of shelter.

Q.18. Distinguish between the Competition and Mutualism. **[Mar 2014]**

Ans:

No.	Competition	Mutualism
i.	Competition can be defined as an interaction between organisms, in which fitness of one overpowers the presence of another.	Mutualism is the positive interspecific interaction in which each member favours the growth and survival of each other.
ii.	In competition one individual is benefitted and other is harmed.	In mutualism, both individuals are benefitted
iii.	Eg. Competition for food between leopards and lions	Eg. Lichen-relationship between alga and fungus.

Q.19. What is parasitism ?

Ans: Parasitism is the relationship between organisms in which one is benefited and other is harmed.

Q.20.Enlist the adaptation acquired by parasites for parasitism.

Ans: i) Anaerobic respiration. ii) Loss of certain organs.

iii) Excessive multiplication. iv) Adhesive organs (e.g. suckers in leeches).

v) Resistant cysts and eggs for safety .

Q.21. What is parasite? Explain the types of parasites with examples.

Ans:i) Parasite is an organism which obtain its food and shelter from the body of another organisms.

ii) There are two types of parasites depending on their location.

a) Ectoparasites b) Endoparasites.

a) Ectoparasites :

These are found on outer surface of host's body. e.g. Leeches, bed bugs.

b) Endoparasites :

i) Those who lives inside the host's body are called endoparasites.

ii) e.g. Plant aphids, Scab mites

iii) Endoparasites can be of two forms: intercellular (inhabiting intercellular spaces) or intracellular (living within the cells in the host's body).

iii) **Epiparasite or hyperparasitism** is a relationship one parasite feed on another parasite which in turn feeds on its host. A protozoan (the hyperparasite) living in the digestive tract of a flea living on a dog is an example of this relationship.

iv) Social parasites take advantage of interactions between members of social organisms such as ants or termites.

v) **In kleptoparasitism,** parasites steal food gathered by the host.

vi) There is one more type of parasitism called as **Brood parasltism.** Female of a one species lays its eggs in the nest of another species. Eggs are incubated and young one are fed by foster mother. e.g. Koel and cuckoo females lay their eggs in the crow's nest. **Adelphoparasite: -** In adephoparasitism parasite is closely associated with the host species often being a member of some family or genus.

Q.22. Explain the predation with one example.

Ans:i) It is an interaction between members of two species in which one species kill and eat up the member of other species.

ii) The killer is called predator and organism that being killed is called prey.
iii) Example of predator- prey relationship are frog and insect, hawk and bird, snake and rat.
iv) Energy flow from one animal to another is due to predation.
v) Prey and predators depend on each other and controls each other.
vi) Reproductive cycles of both are also adapted for the same purpose.

Q.23. Define camouflage. What is the use of camouflage?

Ans: i) Camouflage is the coloration or patterns that help an animal to appear to blend with its surroundings.
ii) It is also common in a variety of other animals (it is used by prey to help hide from predators and it is used by predators to help them conceal themselves as they stalk their prey).

19.3 : Population Attributes

Q.24.Define the population.

Ans: Population is defined as a group of individuals of a species occupying a definite geographic area at a given time.

Additional information

Q.25. Which is the first and second largest populous country?

Ans: China is the first and India is the second populous country.

Q.26. Define demography.

Ans: The study of quantitative and statastical aspects of human population is called demography.

Q.27. What is population? What are the main characteristics of human population?

Ans: Population is a group of individuals of a species occupying a definite geographic area at a given time. The word population is derived from latin word populous meaning people.

Characteristics of population :

i) Natality (Birth rate) ii) Mortality (Death rate) iii) Density
iv) Growth rate. v) Age structure. vi) Sex ratio
vii) Carrying Capacity.

Q.28. Define the term 'natality'. How natality is calculated? [Mar 2013]

OR

Define Natality and Mortality. OR

Explaio how natality and mortality are calculated.

Ans: i) Natality (Birth rate):

a) Natality is defined as the number of births per unit time, per unit area, per 1000 individuals of a population.
b) Size of a population increases, if its natality is high.
c) Natality is calculated as follows :

$$\text{Natality (n)} = \frac{\text{Total number of births in in a year}}{\text{Average population of that year}} \times 100$$

d) In general, human population shows high natality.

ii) Mortality (Death rate) :

a) Mortality is defined as the number of deaths per unit time, per unit area, per 1000 individna of a population.
b) Size of a population decreases, if its mortality is high.
c) Mortality is calculated as follows :

$$\text{Mortality (m)} = \frac{\text{Total number of deaths in a year}}{\text{Average population of that year}} \times 1000$$

d) Mortality rate of human population has decreased over a period of time.

Q.29. Distinguish between Natality and Mortality.

Ans:

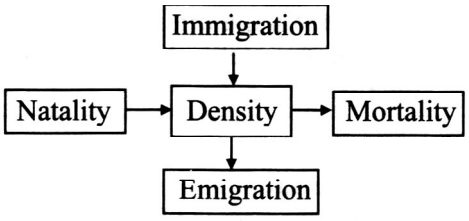
No.	Natality	Mortality
i.	It is the number of births per unit time, per unit area, per 1000 individuals of a population.	It is number of deaths per unit time, per unit area, per 1000 individuals of a population.
ii.	With the increase in Natality size of the population increases.	With the increase in Mortality size of the population decreases.
iii.	It increases population density.	It decreases population density
iv.	It is calculated as follows: $\text{Natality} = \frac{\text{Total number of births in a year}}{\text{Average population of that year}} \times 1000$	It is calculated as follows: $\text{Mortality} = \frac{\text{Total number of deaths in a year}}{\text{Average population of that year}} \times 1000$

Q.30. Explain the term density.

Ans: i) Density is the total number of individuals present per unit

ii) It is calculated as follows :

$$\text{Density (d)} = \frac{\text{Number of individuals}}{\text{Unit area}}$$



iii) Density is never constant, as it keeps on changing from t

iv) Density reflects the success of species in the area.

v) It depends upon birth rate, death rate, rate of reproduction, migration etc.

Q.31.What is growth rate? Under which conditions does growth rate vary?

Ans: i) Natality and Mortality are the two most important aspects of population growth.

ii) Growth rate is the "difference between number of individuals added to the population and lost from the population per unit time".

iii) Hence, Growth rate = $\frac{\text{Natality(n)} - \text{mortality(m)}}{\text{Time(t)}}$

iv) Growth rate varies under following conditions :

a) When natality is greater than mortality, the growth rate of population increases.

b) When natality is less than mortality, the growth rate of population decreases.

Q.32.What is age structure? Give its role.

Ans: The relative proportion of individuals of various age groups in the population is called age structure of population.

i) Age structure of a population is the percentage of individuals of different age groups such as young, adults and old.

ii) It determines the current reproductive status of a population.

Role of age structure:

Age structure determine the trend of the population.

Distribution of age groups determine the trend of population.

a) Growing population : Population having larger number of individuals of the pre-reproductive age groups show a very rapid rate.

b) Steady population : Population having same number of pre reproductive and post reproductive age group is stable.

c) Declining population : Large number of post reproductive and small number of pre reproductive make population decline.

Q.33.Describe the major age groups in a population.

Ans: The three major age groups in a population as proposed by Bodenheimer are :

i) Pre-reproductive group (age 0 to 14 years) :
It includes younger and sexually immature individuals.
They are the source of increase in the population in future.

ii) Reproductive group (age 15 years to 54 years):
It includes the middle age group and sexually mature individuals.
High proportion of this group indicates increasing population.

iii) Post-reproductive group (age 55 years and above) :

Q.34. Which category of age structure does not increase the population size?
Ans: Post reproductive (50 years and above) age group does not increase the population size.

Q.35.List any three important characteristic of a population and explain.
Ans: *Refer Q. 27, 28 and 30.*

Q.36.Define Migration.What are the types of migration?
Ans: i) Migration is the phenomenon process in which organisms move away from the temporary stressful conditions of the habitat to more hospitable area and return when the stressful conditions are over in their original habitat.
ii) Migration is of two types a) Immigration b) Emigration.

19.4 : Biodiversity and Conservation

Q.37.Define biodiversity.
Ans: The occurrence of different types of genes, gene pools, species habitats and ecosystem in a particular place and various parts of earth is called biodiversity.

Q.38.How is biodiversity important for ecosystem functioning?
Ans: Biodiversity is important for ecosystem functioning in the following ways:
i) It has been a general observation by ecologists that communities with more species diversity are more stable than those with less species diversity.
ii) Ecosystems with higher species diversity show higher productivity.
iii) The ecosystems with more species diversity become more resistant to seasonal disturbances.
iv) The ecosystems with more/greater species diversity shows resistance to invasion by alien species.

Q.39.Enlist the aims of conservation of biodiversity.
Ans:i) To maintain ecological processes and life support systems.
ii) To preserve quality of environment.
iii) To improve and quality of natural resources.
tv) To prevent wastage and spoilage of natural resources.
v) To ensure continous production of useful plants, animals and materials by establishing a balanced cycle of harvest and removal.
vt) To help in social and economic development.

Q.40.What is red data book ?
Ans: The Red Data Book is the state document established for documenting rare and endangered pecies of animals, plants.

Q.41.Is Chitah extinct or endangered in India ?
Ans: Chitah is extinct in India.

Q.42.Define endangered species or threatened species giving two examples. OR
Define endangered species. Give two examples of endangered species. [Mar 08]
OR
Explain the concept of endangered species. Give any two examples of endangered plants. [Mar 09]
Ans: Endangered species or threatened species are those species whose number has been reduced to a critical level or whose habitats have been adversely affected so that they may become extinct if not given special protection.

Endangered species:
a) Plant species
i) *Psilotum nudum* ii) *Osmunda regalis*
b) Animal species.
i) Asiatic wild ass ii) White - eyed duck
iii) Red panda iv) Crocodile.

Q.43. Give the Full form of IUCN.
Ans: Informational Union for Conservation of Nature and natural resources.

Q.44.What is IUCN? Describe the IUCN classification of the species.
Ans: IUCN: IUCN (International Union for Conservation of Nature and atural Resources) is an international organization which maintains a Red list or Red Data Book in which endangered plant and animal species are reported.

IUCN has classified the species into four categories as follows :

a) Endangered species.

i) These are the species whose number of individuals is greatly reduced to a critical level.
ii) The habitat of such species is also reduced due to unfavourable environment or human factors.
iii) As a result, it may become extinct if the causative factors continue operating.
iv) e.g. Asiatic wild ass, Psilotum nudum, Osmunda regalis etc.

b) Vulnerable species.

i) These are the species whose number of individuals is greatly reduced in the recent past and continues to decrease.
ii) Their number is decreasing due to over exploitation, extensive destruction of habitat or other environmental disturbances.
iii) Such species are likely to move into the rare species group or endangered species group.
iv) It also includes those species whose population is abundant at present, but is under threat of depletion due to some factors.
v) They are also called Depleted species.
vi) e.g. Clouded leopard, musk deer (Antilope), Ophioglossum pendulum etc.

c) Rare species.

i) These are the species with small population in world, that are not endangered or vulnerable at present but are at risk.
ii) Generally they are localized within a restricted geographical area or live in unusual environment.
iii) e.g. Great Indian bustard (a bird from Gujarat and Rajasthan) and Black buck (Kalweet).

d) Indeterminate species.

i) These species are in danger of extinction, but the reason is unknown.
ii) Enough information is not available to decide the true nature of such species .
iii) e.g. Three banded armadillo of Brazil, short-eared rabbit of Sumatra, Rhinoceros, etc

Q.45.Which factors are responsible to threaten biodiversity?

OR

What are the major causes of species losses in a geographical region?

Ans: Following factors are responsible to threaten biodiversity:

i) Destruction of habitats and fragmentation

a) Factors such as pollution, deforestation are responsible for destruction of number of important habitats.
b) Deforestation also affect the movement of animals hence it affects reproductive power of animals.
c) Number of other factors such as increasing urbanization, overgrazing, agricultural expansion, soil erosion are also responsible for loss of biodiversity.

ii) Pollution

a) Large scale use of synthetic compounds, release of radioactive chemicals, oil spills are polluting rivers and reducing species number.
b) Due to accumulation of pesticides like DDT, PCBs decline in fish eating birds has been observed.

iii) Introduction of exotic species

a) Exotic species are known to threaten survival of native species. e.g. Lantana camara, a plant now has entered into forests and competing with native species.
b) Water hyacinth has become dominant species in pools and ponds.
c) It has become nuisance weed in many nutrient lakes in India.

iv) Over-exploitation of natural resources.

Overfishing, mechanical catching of animal species etc. is a serious threats to wild life.

v) Disturbance in migratory routes

Due to construction of dams fishes are not able to reach their spawning grounds and face extinction.

vi) Lack of education

Majority of people are not aware of the importance of wild life and its effects of destruction.

vii) Official ignorance in the implementation of wild life protection act.

viii) Demand of scarce animal

International demand of products like medicines, perfumes, cosmetics, decoration made fro parts of rare animals and plants is increased. For these products many plant and animals species are getting killed.

ix) Coextinction

When one species become extinct the plants, animals and microbes associated with that species in an obligatory manner, may also become extinct e.g. If a host fish species becomes extinct then parasites dependent on that fish also becomes extinct.

Q.46."Deforestation and endangered species go hand in hand." Comment.

Ans: i) Animals are becoming extinct due to deforestation because due to deforestation their natural habitats are destroyed and being replaced with roads and factories.

ii) All organisms are linked in food chain and interact with their biotic environment.

iii) Disappearance of link disturbs the ecosystem.

iv) Food and any other natural activities of animals are disturbed.

v) Due to deforestation rare species of animals are cut off and not able to reproduce.

vi) Due to deforestation ultimately temperature of earth is rising, conditions necessary for survival of organisms is getting disturbed.

Q.47.Why there is a need to conserve endangered Species of plants and animals? OR

Give reason: It is necessary to conserve endangered species of plants and animals.

Ans: The conservation of endangered species of plants and animals is necessary for the following reasons.

i) To preserve biodiversity.

ii) To maintain ecological balance.

iii) To maintain the number of individuals of a species.

iv) To build national economy.

v) To study life in its natural habitat.

Q.48."Poaching has made many animals endangered". Explain.

Ans: i) Poaching of endangered animals is an illegal offence and punishable under the laws of the land. But, it is widely practiced because this ugly business is very profitable.

ii) Endangered animals are poached for their body parts, which have a high value in the international market.

iii) I vory tusks of elephants, rhino horns, sahtoosh obtained from Tibetan Antelopes, eggs of Sturgeon or Paddle fish to make caviar, etc. are in great demand, and have a premium price in the market.

iv) If mothers of these animals are killed even young ones will die.

v) The extra-ordinary demand for the body parts of endangered animals has threatened their existence, and has pushed them on the verge of extinction.

Q.49. Give two examples of the following.

i) Endangered species and Rare species.

Ans: Endangered species :

a) Asiatic wild ass b) *Gnetum ula.*

Rare species:

a) Great Indian Bustard b) *Hawaiian Monk Seal*

ii) Vulnerable species and Intermediate species

Ans:Vulnerable species

a) Clouded leopard b) *Musk deer.*

Intermediate species.

a) Three Banded Armadillo b) *Rhinoceros.*

Q.50.What are the causes of extinction of wildlife ? OR

Give reasons for a species to become endangered.

Ans: There are two types of causes of extinction namely

i) **Natural causes :** Earthquakes, floods, landslides, volcanic activities, wild-fire etc.

ii) **Man-made causes :**

Following are the man-made causes responsible for extinction:

a) Over-utilizationlover-exploitation of natural resources: It is a major man-made cause of extinction. Excessive cutting of forest trees, over-grazing, up-rooting of orchids and medicinal plants, overfishing, etc has resulted in extinction of many species.

b) **Environmental pollution :** Pollution of soil, water and air caused by human activities leads to depletion of wild life.

c) **Hunting :** Poaching for meat, skin, fur, ivory, rhino horns etc has led to the decline in number of wild animals.

d) **Destruction of habitats :** Due to human activities such as construction of dams and reservoirs, building of roads and rail tracks, mining activities etc. natural habitats of animals are destroyed. As a result the population of wild animals is decreasing considerably.

e) **Introduction of exotic species:** Native species of plants and animals have been badly affected by introduction of exotic species e.g. Congress grass (*Parthenium* sp.) and Lantana camara (an exotic herb).

f) Other causes: These includes the use of plant and animal species for pharmaceuticals, perfumes, cosmetics, decoration, medicines, tourism and tourist activities, ploughing of grasslands etc.

Q.51.What is extinction? Explain its three types.

Ans:i) Extinction is a natural phenomenon, in which species disappear once for all from the earth,

ii) There are 3 types of extinction

a) Natural extinction

This type of extinction has occurred, mainly due to changes in environmental conditions . It is also called background extinction.

b) Mass extinction.

Extinction of large number of species in a short span of time, mainly due to certain catastrophs. One of the example is extinction of dinosaurs.

c) Anthropogenic extinction

Extinction of number of species due to human activities.

Man-made extinction cause a very severe depletion of biodiversity as it occurs at very fast rate.

Q.52.Does construction of dams endangers the forest?

Ans: Construction of dams requires large area hence large and dense forests are destroyed for the construction of dams.

Q.53.Enlist the endangered animals.

Ans:i) Great Indian Bustard.
ii) Musk deer or Antilope
iii) Red fox
iv) White eyed duck
v) One horned rhino
vi) Asiatic wild ass
vii) Red Panda
viii) Crocodile

Q.54.Can you think of a situation where we deliberately want to make a species extinct? How would you justify it?

Ans:i) An organism which is harmful for one or more species/populations, can be made extinct, e.g., the virus causing smallpox has been eradicated world over.

ii) Efforts are on to eradicate malarial parasites and polio virus.

iii) Such species whose extinction will not disturb the food chains, can be made extinct.

Q.55.What are biodiversity hot spots ?

Ans: Biodiversity hot spots are the regions/certain ecosystems which have very high levels of species richness and high degree of endemism and need maximum protection.

Q.56.Describe the biodiversity hotspots in Maharashtra,

Ans: i) Biodiversity hotspot is a biogeographic region which is a significant reservoir of biodiversity which is threatened with destruction.

ii) In Maharashtra there are 5 national parks and 11 sanctuaries.

iii) The Western Ghats or the Sahyadri is a mountain range along the western side of India. It runs north to south along the western edge of the Deccan Plateau, and separates the plateau from a narrow coastal plain along the Arabian Sea.

iv) The major hill range starting from the north is the Sahyadri (the benevolent mountains) range. This range is home to many hill stations like Matheran, Lonavala-Khandala, Mahabaleshwar, Panchgani, Amboli Ghat, Kudremukh and Kodagu, The range is called Sahyadri in northern Maharashtra and Sahya Parvatam in Kerala.

Q.57.How many national parks are there in India?

Ans: There are 80 national parks in India.

Q.58. How many wild-life sanctuaries are there in India?

Ans: There are 441 wild life sanctuaries in India.

Q.59. How many national parks and sanctuaries are there in Maharashtra?

Ans: 5 national parks and 11 sanctuaries.

Q.60. Define endangered species. Add a note on their conservation.

OR

What are the methods for conservation of endangered species?

Ans: Endangered species: *For the definition of endangered species Refer Q. 42.* **Conservation of Endangered Species:**

There are two types of methods for conservation of endangered species. They are as follows:

a) In-situ conservation :

It includes hot-spot methods, which protect, preserve and restore endangered species in their own habitats or man-made ecosystems. Activities like grazing, cultivation and collection of forest products are prohibited. It also includes maintenance of protected areas such as national parks, wild-life sanctuaries, natural reserves and biosphere reserves.

b) Ex-situ conservation :

It is the conservation of endangered species outside their natural habitats.

It includes

i) Conservation of botanical gardens, culture collections and zoological parks.

ii) Preservation of gene pool, cells, tissues etc.

iii) Domestication of species in protected areas and then introduction to their natural habitats.

Q.61. Give in brief the concept of in-situ conservation.

Ans: i) In- situ conservation includes hot-spot methods which protect,preserve and restore endangered species in their own habitat in protected areas.

ii) This method includes prohibition of grazing,cultivation and collection of products from the forests.

iii) It includes maintenance of protected areas such as national parks,wild life sanctuaries and biosphere reserves. In situ conservation covers 3.2% of India's total area.

19.5 : Environmental Issues

Air pollution and its control

Q.62.Define pollution.

Ans: Pollution can be defined as 'an undesirable change in physical, chemical or biological characteristic of our air, water and land that mayor will harmfully affect human life, industrial progress, living conditions and cultural assets.

Q.63.Write a note on Bhopal Gas tragedy.

Ans: i) Bhopal gas tragedy occurs in 1984 due to leakage of methyl isocyanate gas.

ii) In Bhopal, M.P., methyl isocyanate gas was leaked from Union Carbide pesticide plant.

iii) Nearly about 5000 people were killed in this tragedy.

iv) MIC causes swelling in lungs and develop catract in eyes.

v) Many people become blind and seriously affected.

vi) Vegetation in areas of 3.5 sq km around Union Carbide factory was severely affected.

Q.64.Which type of air pollutants are found in polluted air ?

Ans: Following types of air pollutants are found in polluted air:

i) Fine particles : These includes carbon particles, metallic dust, tars, resin, aerosols, solid oxides, nitrates and sulphates. These particles has diameter less than 100 urn.

ii) Coarser particles : These includes carbon particles, heavy dust. These includes particles of diameter over 200 μm

iii) Compounds of gases : Compounds of gases such as sulphur compounds, nitrogen compounds and oxygen compounds.

iv) Others : Other pollutants include halogens and radioactive substances.

Q.65.What are the major sources of air pollution? [Mar 2013]

Ans: The particulate matter and gaseous matter are the major sources of air pollution.

Q.66.Define Air pollution. Enlist the causes for air pollution.

OR

Describe the sources of air pollution.

Ans: Any undesirable change in the physical, chemical and biological characteristics of air that exert adverse effect on human beings is called air pollution. Air pollution may be defined as the presence of materials in the air in such a concentration which is harmful to man and the environment.

Causes for air pollution are as follows:

i) Industrial pollutant :
- a) Major air pollutants are released from industrial chimneys and power houses.
- b) CO, CO_2, H_2S, SO_2 and hydrocarbons are the major pollutants released from industries.
- c) Chemical industries release hydrochloric acid, chlorines, nitrogen oxide, zinc, lead etc.

ii) Automobiles :
- a) Automobiles are the largest source of air pollution in big cities.
- b) Combustion of petroleum emits various lead compounds.
- c) Automobiles release CO, nitrogen oxides and hydrocarbon.

iii) Burning of fuels :
- a) Coal on combustion produces CO_2.
- b) Incomplete combustion yields CO and varieties of hydrocarbons including methane and soot.

iv) Agriculture :
- a) Crop spraying and dusting for pest and weed control are responsible for emitting organic phosphates, chlorinated hydrocarbons, arsenic and lead into air

v) Heating plants: Heating plants for homes,apartments,school and industrial building are the largest source of air pollution.

vi) Natural pollutant :
- a) Pollen.hydrocarbon released by vegetation,dust from deserts, storms and volcanic activity.

Q.67.What is smog? Which factor is responsible for the formation of smog ?

Ans: Smog is a combination of smoke and fog. It is caused due to burning of large amount of coal.

Q.68.Which place in Mumbai has highest sulphur dioxide pollution ?

Ans: Chembur - Trombay area of Mumbai has highest concentration of sulphur dioxide.

Q.69. Enlist the pollutants present in air and their effectson human health.

Ans:

	Pollutants		Effects on human being
1.	Carbon monoxide	a. b. c.	It reduces oxygen carrying capacity of haemoglobin which leads to hypoxia It causes headache, muscular weakness, nausea, exhaustion, Excess formation of carboxy haemoglobin lead to death due to CO-poisoning.
2.	Hydrogen sulphide		Headache ,nausea,collapse,conjunctivitis,irritation of mucus membrane,colic diarrhea,bronchial pneumonia,coma and even death. Loss of apetite.
3.	Tobacco smoke		causes lung cancer,pulmonary and heart diseases
4.	Sulphur dioxide	a.	Increases chances of occurrence of asthma, bronchitis, emphysema etc.
5.	N_2O		Long exposure causes acute respiratory diseases.

Q.70. Enlist the air pollutants and describe their effects on plants.

Ans:

Pollutant	Effect on plants
Dust, smoke, particles	Reduces light by settling on leaves which ultimately retards photosynthesis
Sulphur dioxide	Causes chlorosis, plasmolysis, membrane damage and metabolic inhibition
Hydrogen sulphide	Causes leaf lesions, defoliation and reduced growth

Q.71.Which city has highest pollution of suspended particulate matter?

Ans: Delhi has highest pollution of suspended particulate matter.

Q.72.Describe the measures to control air pollution.

Ans: The important basic strategies to prevent or control air pollution are as follows:

i) Selection of suitable fuel like fuel with low sulphur content and its efficient utilisation to reduce pollutant level in the emission.

ii) Modifications in industrial processes and/or equipments used in the industries to reduce pollutants in their· emissions.

iii) Setting up of industries and manufacturing units at right sites (away from residential areas).
iv) Selection of methods to disperse the pollutants/emissions like filtration and adsorption using activated carbon can be done for removing pollutants gases.
v) Adequate legislation has to compel control of pollutants at their sources.
vi) Devices like positive crank case ventilation valve and catalytic converter should be fully maintained by public to reduce exhaust emission.
vii) PUC certificate is mandatory for all vehicles. Owner of vehicles emitting pollutants beyond a certain permissible limits should be punished.
viii) Particulate pollution from industry and power generation can be controlled by electrostatic precipitator.
ix) Two stroke engine should be replaced by using the more advanced technology for four stroke engine.
x) Methanol is complete,clean burning fuel that forms only steam and water.
xi) Chemical properties like differential solubility of gases in water can be used to remove gaseous pollutants.
xii) Scrubber is device which can effectively separate many gases such as ammonia and sulphur dioxide.
xiii) Certain acts like Bombay Motor vehicles Act, 1989 empowers authority to suspend the registration of vehicle emitting a pollutant gases beyond limits.
xiv) Instead of petrol unleaded petrol is recommended. CNG is the best option than unleaded petrol.
xv) Mixed fuels containing 40% methanol should be used.
xvi) Air pollution control boards of state and central level should observe whether industries are following the rules and regulations or not. Water pollution

Q.73.Define water pollution.

Ans: Water pollution can be defined as the addition of some substances (organic, biological or radiological) or factor (heat,pH) which degrades the quality of water so that it either becomes health hazard or unfit for use.

Q.74.Describe the sources of water pollution.

Ans: Sources of water pollution are as follows:

i) Domestic wastes
a) It includes human and animal excreta, food residues, detergents, cleaning agents and other biological pollutants.
b) It is always rich in organic matter, bacteria and other biological pollutants.

ii) Industrial wastes
a) Industrial wastes includes waste water discharged from industries into water bodies.
b) Industries include chemical and metallurgical industries, food processing plants, textile, paper and sugar mills, oil refineries, tanneries etc.
c) It contains several inorganic and organic pollutants

iii) Agricultural wastes
a) It includes fertilizers and pesticides.Pesticides include fungicides, herbicides, insecticides, nematicides, rodenticides and soil fumigants.
b) It includes wide range of chemicals such as chlorinated hydrocarbons, organophosphates, metalic salts, carbonates, thiocarbonates, derivatives of acetic acid etc.

iv) Thermal wastes
Thermal waste includes water effluents from electrical machinery , thermal and nuclear power plant Oxygen content of water decreases due to heat and it becomes unfit for the survival of aquatic animals.

v) Radioactive waste Effluents from nuclear plants contains radioactive elements or wastes.

vi) Shipping water pollution
It includes oil spills, human sewage and other wastes. Oil pollution is of major concern as it not only occurs through major spills but also through small spills and cleaning operations.

Q.75. Distinguish between the Agricultural water pollution and Shipping water pollution. [Mar 2014]
Ans:

No.	Agricultural water pollution	Shipping water pollution
i.	Agricultural water pollution includes sediments, fertillzers and farm animal wastes.	Shipping water pollution includes oil, human sewage and other wastes.
ii.	Agricultural water pollution is caused due to water run off from agricultural lands.	It is caused due to spills from ships, offshore drilling rigs and cleaning operations on ships.

Q.76. Give the effects of water pollution on human health. [Oct 2013]

Ans: Effects of water pollution are as follows :

i) Several water borne infectious diseases are directly related to polluted water.
ii) In Japan, mercury poisoning caused Minimata disease. Fishes, shell fishes contaminated with methyl mercury were eaten by fishermen. Many fishermen were affected or dead who ingest affected fishes.
iii) The heavy metal water pollutants causing health hazards in human beings are mercury, lead, arsenic, cadmium, selenium etc.
iv) Mercury causes abdominal pain, headache, diarrhoea, haemolysis, and chest pain.
v) Lead causes anaemia, vomiting, loss of appetite, convulsions, damage of brain, liver and kidney.
vi) Arsenic causes disturbed peripheral circulation, mental disturbance, liver cirrhosis, hyperkeratosis, lung cancer, ulcers in gastro-intestinal tract and kidney damage.
vii) Cadmium causes diarrhoea, growth retardation, bone deformation, kidney damage, testicular atrophy, anaemia, hypertension, injury of central nervous system and liver.
viii) Selenium causes damage of liver, kidney and spleen, fever, nervousness, vomiting, low blood pressure, blindness and even death.

Q. 77. Do fertilizers pollute water ?

Ans: Yes, fertilizers pollute the water.

Q.78."Industries are pouring poisons in water."

Ans:i) The industrial effluents contain pollutants like asbestos, arsenic, mercury, lead, cadmium selenium, oil, and many other poisonous materials.
ii) In many countries, industrial water is not treated adequately before discharging it into rivers or lakes.
iii) This is particularly true in the case of small scale industries that do not have sufficient capital to invest in pollution control equipment.
iv) Many of the pollutants are also carcinogenic i.e. they can cause cancer.
v) Some pollutants like sodium can cause cardiovascular diseases, while mercury and lead cause nervous disorders.
vi) Excess fluoride in water may damage the spinal cord, while arsenic can cause significant damage to the liver and the nervous system.
vii) In addition to all these, organic compounds present in the polluted water facilitate the growth of algae and other weeds, which in turn use more oxygen dissolved in the water.
viii) This reduces the amount of oxygen dissolved in the water and the consequent shortage of oxygen for other aquatic life.

Q.79.How water pollution can be controlled or prevented ?

Ans: Water pollution can be controlled or prevented by following techniques:

i) Stabilization of ecosystem is the most reliable way to control water pollution. It reduces input of waste. It helps in trapping of nutrients, fish management and aeration. Ecobalance and species diversification can be restored by various physical and biological methods.
ii) Recycling of wastes like paper pulp, municipal and industrial effluents reduces pollution. Many of the wastes can be recycled to generate cheaper fuel gas and electricity.
iii) Various physiochemical techniques used for removal of pollutants are adsorption, electrodialysis, reverse osmosis and ion-exchange. Brackish water can be desalinated by reverse osmosis. It is effective method for treatment of sewage effluents.

Radioactive wastes Management

Q.80.Write a brief account on the radioactive wastes.

Ans:i) Nuclear or radioactive wastes are extremely potent pollutants and they have to be dealt with utmost caution.
ii) Radiation, that is given off by nuclear waste is extremely damaging to biological organisms, because it causes mutations to occur at a very high rate.
iii) At high doses, nuclear radiation is lethal; but at lower doses it creates various disorders, the most common being cancer.
iv) Due to atomic explosions and also due to atomic reactors a large quantity of radioactive materials find its way in the ecosystem.
v) The radioactive waste is normally disposed by land filling. For land filling the deep pits are dug in desert

areas or in the sea bottom to dispose the radioactive waste. These pits are capped by concrete to avoid contamination.

81. Mention the case study of organic farming.

i) Integrated organic farming is cyclical and zero waste procedure.
ii) Waste products of one process are used as nutrients for the other process so that maximum utilization of resources is possible.
iii) Ramesh Chandra Dagar, a farmer in Sonipat, Haryana, includes bee -keeping, dairy management, water harvesting, composting and agriculture in a chain of processes.
iv) It supports each other and is an ideal, economical, extremely useful and sustainable process.
v) Use of chemical fertilizers can be avoided for crops as cow dung can be used as manure.
vi) Crop waste is used as compost, natural fertilizer or for producing biogas which can be used as source of energy for the farm. This is the practice of integrated organic farming.

Case study

Q.82.Mention anyone case study related to water pollution. Which control measures were used in that case ?

Ans:i) In the town of Arcata, situated along the northen coast of California,Collaborating with biologist from the Humboldt state university, the towns people created an integrated waste water treatment process within a natural system.
ii) The cleaning occurs in two stagesa.
a) The conventional sedimentation.filtering and chlorine treatments are given . After this stage, lots of dangerous pollutants like dissolved heavy metals still remain.
b) A marsh land is developed and plants like algae, fungi and bacteria were seeded in this area.
iii) Due to this heavy metals were neutralised and assimilated when water flows through these marshes and gets purified naturally.
iv) Marshes also shows a biodiversity in the form of fishes, animals and birds

Multipal Choice Questions

1. Adaptation for climbing and balancing on trees is called
a) fossorial b) cursorial
c) arboreal d) desert

2. Adaptation for flying is called
a) arboreal b) desert
c) aquatic d) volant

3. When the organisms live together in such a manner that one organism is benefitted, while other has no effect, it is called
a) commensalism b) mutualism
c) parasitism d) amensalims

4. In commensalism
a) both partners are benefitted
b) both partners are harmed
c) weaker is benefitted while stronger is unharmed
d) none of these

5. Small fish get stuck near the bottom of a shark and derives its nutrition from it. This kind of association is called as
a) symbiosis b) commensalims
c) predation d) parasitism

6. The phrase - " sharing of food" or "sharing table" is used to describe

7. The second largest populous country is
a) China b) Pakistan
c) India d) Australia

8. Growth rate of population is given by
a) (Natality – Mortality)
b) $\frac{\text{(Natality – Mortality)}}{\text{unit time}}$
c) (Natality – Mortality) $\frac{\text{Total population}}{\text{Total Migration}} \times 1000$
d) (Mortality– Natality) $\frac{\text{Total population}}{\text{Total Migration}} \times 1000$

9. The rate at which new born individuals are joining the population by reproduction is known as
a) natality b) fertility
c) contractibility d) none

10. Population growth of a country depends upon
a) birth and death rates
b) death rate and emigration
c) birth rate and emigration
d) all of the above

11. The number of births per 1000 individuals of a population per year is
a) natality b) mortality
c) sex ratio d) age structure

12. The animals which are in danger or extinction of which is also possible are known as
a) threatened b) vulnerable
c) endangered d) rare

13. Endangered species is
a) wild species facing problem of extinction
b) non reproductive species
c) genetically modified variety
d) domestic species

14. The natural cause of extinction of species is
a) flood
b) hunting
c) industrialization
d) destruction of natural habitats.

15. The reason for extinction of wildlife is
a) destruction of natural habitat
b) poaching for meat, skin, ivory etc
c) both a) and b)
d) afforestation

16. Red data book provides data on
a) red flowered plants
b) red coloured fishes
c) endangered plants and animals
d) red eyed birds

17. 'Which is preserved in National Park ?
a) Flora b) Fauna
c) Both a) and b) d) None of these

18. One of the ex-situ conservation methods for endangered species is
a) wildlife Sanctuaries
b) biosphere Reserves
c) cryopreservation
d) national parks

19. Chipako andolan movement is to protect the
a) flora b) fauna
c) trees d) rivers

20. Hot Spots are the examples of
a) Insitu conservation
b) Ex-situ conservation
c) wild life protection
d) water conservation

21. Hot spot method of in situ conservation protects _____species in its own habitat. **[Oct 2013]**
a) vulnerable b) rare
c) indeterminate d) endangered

22. Red Data Book is maintained by
a) WWF b) WHO
c) IUCN d) UN.

23. Kaziranga wild life sanctuary is located in
a) Uttar Pradesh b) Gujarat
c) Jammu and Kashmir d) Assam

24. Which of the following is not biodegradable ?
a) DDT b) Polythene bag
c) Plastic material d) All of these

25. Pollution is mainly caused by
a) natural activities
b) biotic factors
c) interaction of abiotic and biotic factors
d) human activation

26. Gas released during Bhopal tragedy was
a) methyl isocyanate
b) sodium isothiocyanate
c) potassium isothiocyanate
d) ethyl isothiocyanate

27. Smog is formed by
a) smoke and dust b) smoke and fog
c) fog and dust d) dust and rain

28. _____increase the temperature.
a) H2 b) H2O
c) C d) CO_2

29. Kolkata has the highest_____ pollution during peak traffic hours.
a) sulphur dioxide
b carbon monoxide
c) O_3
d) suspended particulate matter

30. NEERI is
a) National Ethological and Ecological Research Institute
b) National Eugenics and Ecological Research Institute
c) National Ecological and Environment Research Institute
d) National Environmental Engineering Research Institute

31. In which device a fine spray of water is 'used for separation of ammonia and sulphur dioxide? **[Mar 2013]**
a) Scrubber
b) Diesel engine

c) Smokers
d) Electrostatic precipitator

32. Minamata disease is caused by
a) $HgCl_2$ b) Ca^{++}
c) MIC d) Ca

33. Sewage includes
a) dead remains of biological matter
b) smokes from chimneys
c) wastes from homes, hospitals, laboratories etc.
d) insecticides

34. Minamata disease was caused due to the consumption of
a) sea food containing lot of cadmium
b) fish contaminated with mercury
c) oysters with lot of pesticide
d) sea food contaminated with selenium

35. The bioaccumulation of pesticides in birds leads to
a) weakening of nest
b) egg shell thinning
c) failure of migration
d) loss of feather colour

36. Prevention and control of water pollution can be done by
a) reducing waste input
b) harvesting the biomass
c) stabilizing the ecosystem
d) all of the above

37. In integrated organic farming
a) waste of one process is used as nutrient for other process
b) waste of one process which is less harmful is disposed off
c) waste are disposed directly in ecosystem
d) waste is not generated

Answer Keys

1.	c)	**2.**	d)	**3.**	a)	**4.**	c)	**5.**	b)	**6.**	a)	**7.**	c)	**8.**	b)	**9.**	a)	**10.**	d)
11.	a)	**12.**	c)	**13.**	a)	**14.**	a)	**15.**	c)	**16.**	c)	**17.**	c)	**18.**	c)	**19.**	c)	**20.**	a)
21.	d)	**22.**	c)	**23.**	d)	**24.**	d)	**25.**	d)	**26.**	a)	**27.**	b)	**28.**	d)	**29.**	b)	**30.**	d)
31.	a)	**32.**	a)	**33.**	c)	**34.**	b)	**35.**	b)	**36.**	d)	**37.**	a)						