BRAIN INTERNATIONAL SCHOOL

Biology- Assignment **CLASS: XII** **NOVEMBER-2024**

SUBJECT- BIOLOGY

Chapter :11 Organisms and populations

MULTIPLE CHOICE QUESTIONS

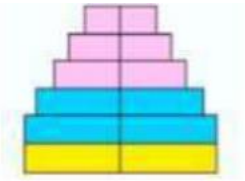
1. Important attributes belonging to a population, but not to an individual are:

i)Birth rate and death rate (ii) Male and female (iii) Birth and death (iv) Sex ratio

Select the correct option from the given options.

(a) i only (b) ii only (c) (ii) and (iii) (d) (i) and (iv)

2 The status of the human population reflected in the human age pyramid given below is:



(a) declining population (b) stable population (c) expanding population (d) extinct population

3. A tight one-to-one relationship between many species of fig tree and certain wasps is an example of

(a) commensalism (b) parasitism (c) amensalism (d) mutualism

4. Interaction between clown fish living among the stinging tentacles of sea anemone is an example of

(a) amensalism(b) mutualism (c) parasitism(d) commensalism

5. Examples that show commensalism are

(i) An orchid growing on a mango tree (ii) Cuckoo bird and crow (iii) Cuscuta growing on Nerium plant (iv) Barnacles growing on a whale

(a) (i) and (ii) (b) (i) and (iv) (c) (ii) and (iii) (d) (ii) and (iv)

6. Exponential growth in plants can be expressed as:

(a) Lt = L0 + rt (b) W1= W0 e rt (c) W1 = W0 e rt (d) W1 = W0 + e rt

7. In asymptote state, population is:

(a) Increasing (b) Decreasing (c) Stabilized (d) Changing

8. The two intermediate hosts which the human liver fluke depends on to complete its parasitic mode of life cycle so as to facilitate its parasitisation of its primary host are:

(a) Snail and mosquito (b) Fish and human being (c) Snail and fish (d) Mosquito and fish

Assertion-Reason Questions

Answer these questions by selecting the appropriate option given below:

(a) Both assertion and reason are true and reason is the correct explanation of assertion.

(b) Both assertion and reason are true and reason is not the correct explanation of assertion.

(c) Assertion is true but reason is false.

(d) Assertion is False but reason is true.

1. Assertion: Darwin showed how even a slow-growing animal like an elephant could reach enormous numbers.

Reason: When resources in the habitat are unlimited, each species has the ability to realise its innate potential fully.

2. Assertion: The Mediterranean Orchid, uses sexual deceit to get pollinated by a species of bee.

Reason: The female changes its colour depending on the temperature of that area.

3. Assertion: Cattle egret and grazing cattle in close association is a classic example of commensalism.

Reason: As grazing catle move through the field, they stir up and flush out the insects from the vegetation that otherwise might be difficult for egrets to find and catch.

4. Assertion: The Monarch butterfly is highly distasteful to the predators.

Reason: The butterfly has a very rough kin, which is not palatable.

5. Assertion: Cattle and goat are not seen browsing on Calotropis growing in abandoned fields.

Reason: Cattle and goats avoid grazing on Calotropis, because of the offensive smell of its flowers.

Very Short Answer Type Questions(2 marks)

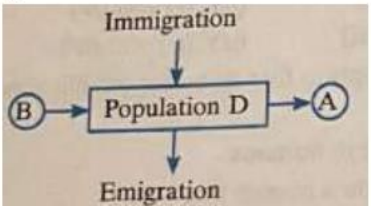
1. List and explain any two factors that lead to a decrease in the population density of an area.

2. Cattle and goats do not browse the Calotropis plant. Justify the statement giving reasons.

3. Abingdon tortoise in Galapagos islands became extinct within a decade on introduction of goats in the island. Explain giving reason.

4. Some species of insects and frogs have evolved specific features that help them from being detected"- Justify with examples

5. Write the best method to measure the population density of a single banyan tree in comparison to 20 Parthenium weeds in a forest by an ecologist. Explain and justify your answer.



6. Observe the schematic representation given above and answer the following questions:

(a) Identify A and B

(b) Calculate the growth rate of bacteria in a curd sample, where 1 million bacteria increased to two million, within a period of one hour.

Short Answer Type Questions (3marks)

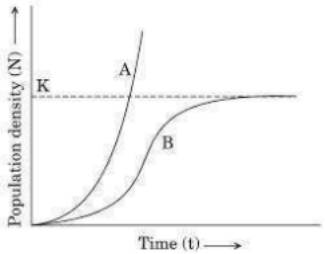
1. (a) How does the Mediterranean orchid 'Ophyrs' ensure its pollination by bees without offering any floral reward?
(b) Explain the kind of population interaction observed in the following picture

2. State the various defence mechanisms the following organisms have evolved with, to protect themselves from predators:
(a) Frogs (b) Monarch butterfly (c) Plants (Morphological and chemical defence against herbivores)
3. (a) What does the equation dN/dt = rN express in terms of population growth?
(b) Write the significane of „r" in a population survey.
4. "The population of a metro city experiences fluctuations in its population density over a period of time"
(a) When does the population in a metro city tend to increase?
(b) When does the population in metro city tend to decline?
(c) If 'N' is the population density at the time „t" write the population density at the time „t + 1".
5.(a) Write how parasites have evolved with adaptations to co-exist with their hosts in an ecosystem.
(b) Parasites are host-specific and tend to co-evolve. How would the parasite respond if the host evolves a certain mechanism to reject the parasite?
6. Explain the differences between commensalism and mutualism types of interactions, with the help of a suitable example of each.

CASE STUDY BASED QUESTION

1 Predators are not always successful in their attacks. In fact the hit-rate usually is quite low when they are solitary predators.The hit-rate is higher when they hunt in packs like lions, but then they have to share the loot amongst the pack. They are dependent on the prey for their supply of energy, they have to conserve this, so only if there is a fair chance of a hit will they spend their energy on an attack. Apart from that, they cannot afford to be injured. Especially when they are solitary hunters, an injury will decrease or nullify their chance of success, probably leading to death.
a) How do predators control the species diversity in an ecosystem?
b) Name the predator that was used to control the prickly pear cactus in Australia
c) What are predators prudent in nature?
d)Name any two defences employed by the prey to protect themselves from the predator.

2. A population of 100 spotted deer was living without any carnivores in an enclosure of a few hectares of rich tropical forest land. Deer census was taken after a few years. Now study the graph given below and answer the questions that follow.



(a) Identify the curve that represents the deer population.
(b) Is it a realistic one? Justify.
(c) Write the equation for the same.
(d)What would have happened if the carnivores were also present in the ecosystem?

CHAPTER 12 : ECOSYSTEM

MULTIPLE CHOICE QUESTIONS

1. The mass of living material at a trophic level at a particular time is called

a) Standing rate b) Gross primary productivity c) Standing crop d) Net primary productivity

2. If we completely remove the decomposers from an ecosystem, their functioning will be adversely affected because

a) Herbivores will not receive solar energy b) Energy flow will be blocked c) The rate of decomposition will be very high d) Mineral movement will be blocked

3. If X is the amount of energy produced by the producers, which of the following is the correct amount of energy received by humans from the producers in a food web?

a) Only 10% b). Either 10% or 1% c)Either 10%, 1% or 0.1% d). Humans are not part of a food web

Assertion-Reason Questions

Answer these questions by selecting the appropriate option given below:

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(b) Both assertion and reason are true and reason is not the correct explanation of assertion.

(c) Assertion is true but reason is false.

(d) Assertion is False but reason is true.

1. Assertion: The shorter food chains are advantageous than longer food chains in terms of energy.

Reason: The main source of energy of biosphere is "SUN".

2. Assertion: The pyramid of biomass in a sea is generally inverted.

Reason: The biomass of phytoplankton exceeds that of fishes.

3. **Assertion**: Removal of keystone species causes serious disruption in the functioning of the community.

Reason: Key stone species are low in abundance (or biomass) than the dominant species.

4. **Assertion**: The energy utilised by an organism for growth is not transferred to the next trophic level. Reason: Growth causes an increase in biomass.

5. **Assertion**: Humus is organic in nature.

Reason: Steps occurring before humification ensure the removal of most inorganic substances from the detritus.

Very Short Answer Type Questions(2 marks)

1. Why the rate of assimilation of energy at the herbivore level is called secondary productivity?

2. Cite an example of an inverted ecological pyramid. What kind of pyramid of energy would it have?

3. Why is the number of trophic levels in an ecosystem limited?

4. In the context of primary productivity, which ecosystem would be more productive? A natural old forest, a young forest, alpine meadow, a shallow polluted lake.

5. The Tundra desert's gross primary productivity (GPP) is 800 kilocalories/m2 and respiration losses are about 200 kilocalories.

(a) What is the net primary productivity of the desert? Show calculations.

(b) Why do deserts have the least NPP across most ecosystems?

Short Answer Type Questions (3marks)

1. Discuss the role of healthy ecosystem services as a prerequisite for wide range of economic, environmental and aesthetic goods and services.

2. A farmer harvests his crop and expresses his harvest in three different ways:

i) I have harvested 10 quintals of wheat. ii) I have harvested 10 quintals of wheat today in one acre of land.

iii) I have harvested 10 quintals of wheat today in one acre of land, six months after sowing. Do the above statements mean one and the same thing? If your answer is “yes” give reason. And if your answer is “no” give the meaning of each expression.

3. What will happen to an ecosystem if

a) All producers are removed?

b) All organisms of herbivore level are eliminated?

c) All top carnivore population if removed? 18. In the context of the transfer of energy in an ecosystem, what does ‟10kg of deer‟s meat is equivalent to 1 kg of lion‟s flesh‟ mean?

CASE STUDY BASED QUESTION

Interaction of biotic and abiotic components result in a physical structure that is characteristic for each type of ecosystem. Identification and enumeration of plant and animal species of an ecosystem gives its species composition. Vertical distribution of different species occupying different levels is called stratification. For example, trees occupy top vertical strata or layer of a forest, shrubs the second and herbs and grasses occupy the bottom layers. The components of the ecosystem are seen to function as a unit when you consider the following aspects: (i) Productivity; (ii) Decomposition; (iii) Energy flow; and (iv) Nutrient cycling. To understand the ethos of an aquatic ecosystem let us take a small pond as an example. This is fairly a self-sustainable unit and rather simple example that explain even the complex interactions that exist in an aquatic ecosystem. A pond is a shallow water body in which all the above mentioned four basic components of an ecosystem are well exhibited. The abiotic component is the water with all the dissolved inorganic and organic substances and the rich soil deposit at the bottom of the pond. The solar input, the cycle of temperature, day-length and other climatic conditions regulate the rate of function of the entire pond. The autotrophic components include the phytoplankton, some algae and the floating, submerged and marginal plants found at the edges. The consumers are represented by the zooplankton, the free swimming and bottom dwelling forms. The decomposers are the fungi, bacteria and flagellates especially abundant in the bottom of the pond. This system performs all the functions of any ecosystem and of the biosphere as a whole, i.e., conversion of inorganic into organic material with the help of the radiant energy of the sun by the autotrophs; consumption of the autotrophs by heterotrophs; decomposition and mineralisation of the dead matter to release them back for reuse by the autotrophs, these event are repeated over and over again. There is unidirectional movement of energy towards the higher trophic levels and its dissipation and loss as heat to the environment

1) Autotrophs consumption in the ecosystem occurs by …… (a) Decomposers (b) Autotrophs (c) Heterotrophs (d) Herbivores 2).....are represented as a consumer. (a) Zooplanktons (b) Fungi (c) Flagellated (d) Algae

3. Write definition of „Stratification‟ and give one example of it.

4.Which decomposers are important to function ecosystem?

CHAPTER 13: BIODIVERSITY AND ITS CONSERVATION

MULTIPLE CHOICE QUESTIONS

1.Which of the following is an incorrect statement?

A. Biodiversity is moderate in temperate regions.

B. Diversity between two communities is called B- Diversity.

C. Species richness decreases with increasing explored area.

D. Diversity decrease from lower to higher altitudes on a mountain.

2.According to Alexander Von Humboldt within a region species richness increases with increasing explored area, but up to a limit. On a logarithmic scale the relationship is a

A. J shaped curve

B. Sigmoid curve

C. Straight line

D. Rectangular Parabola

3.The Nile perch of Lake Victoria led eventually to the extinction of an ecologically unique assemblage of more than 200 species of cichlid fish in lake. This is due to:

A. Over-exploitation

B. Alien species invasion

C. Fixed habitat

D. Co-Extinction

4. Which of the following is not an ex-situ conservation.

A. Botanical Garden

B. Seed banks

C. DNA banks

D. National parks

5.The accelerated rates of species extinction that the world is facing now are largely due to:

A. Natural habitats

B. Co-extinctions

C. Habitat loss

D. Human activities

Assertion-Reason Questions

Answer these questions by selecting the appropriate option given below:

(a) Both assertion and reason are true and reason is the correct explanation of assertion.

(b) Both assertion and reason are true and reason is not the correct explanation of assertion.

(c) Assertion is true but reason is false.

(d) Assertion is False but reason is true.

1.Assertion: India is one of the 12 mega diversity countries of the world.

Reason: With only 4.2% of the land area India,already accounts for 5-6% of the recorded species of the world.

2.Assertion: Habitat loss and fragmentation is the most important cause driving animals and plants to extinction. Reason: Habitat loss and fragmentation causes alien species invasion

3.Assertion : The diversity of plants and animals is uniform throughout the world.

Reason: Tropical environments are more constant unlike temperate ones.

4.Assertion (A): Sacred groves are highly protected.

Reason (R): They are of religious importance to the communities.

5.Assertion: Species with low genetic variability are generally greater risk of extinction than species with more genetic variability. Reason: Species with low genetic variability are more venerable to disease, predators and other environmental challenges.

Very Short Answer Type Questions(2 marks)

1.What is the mission of Ramsar Convention?

2. Explain the defense mechanisms evolved in preys to avoid overpopulation of their predators.
3. In a species area graph what is value of „Z" regardless of the taxonomic group or the region and give one example.
4.What is the reason behind the vast diversity in Indian ecology?
5.Write notes on the „rivet popper hypothesis" by Paul Ehrlich.

Short Answer Type Questions (3marks)

1.How can the loss of biodiversity be prevented?
2. Explain the ecosystem service. Write any four ecosystem services rendered by the natural ecosystem. Are you in support of or against imposing a charge on the service given by the ecosystem?
3. a) what are threatened and endangered species?
b)Suggest two practices giving one example of each, that help to protect rare or threatened species.

CASE STUDY BASED QUESTION

Read the following and answer any four questions from (i) to(v) given below. Excessive exploitation of species ,whether a plant or animal reduces the size of its population so it becomes vulnerable to extinction .Such as Dodo and passenger pigeon have become extinct due to over exploitation by humans.Thus the world is facing accelerated rates of species extinctions, largely due to human interference.

1. Which of the following causes of biodiversity loss is not included in the evil quartet?
a) coextinction
b) pollution.
c) Alien species invasion.
d)Habitat loss and fragmentation

2.. Identify the species that have become extinct due to over exploitation a) Stellar sea cow.
b) Yucca moth.
c) Blattaorientalis.
d) Nile perch

3. Factors which make species susceptible to extinction are

a) large population size.
b) lack of genetic variability
c) lower status of trophic level.
d) ability to switch over to alternate foods

4. Assertion:Pollution reduces species biodiversity

Reason: Spill over of oil in sea causes death of several marine animals.

a) Both assertion and Reason are true and Reason is the correct explanation of assertion
b) Both assertion and Reason are true but Reason is not the correct explanation of assertion
c) Assertion is true but reason is false
d) Both assertion and Reason are false

5. is the first major cause ofspecies extinction a)Coextinction. b) Over exploitation c) Habitat destruction d) Alien species invasion