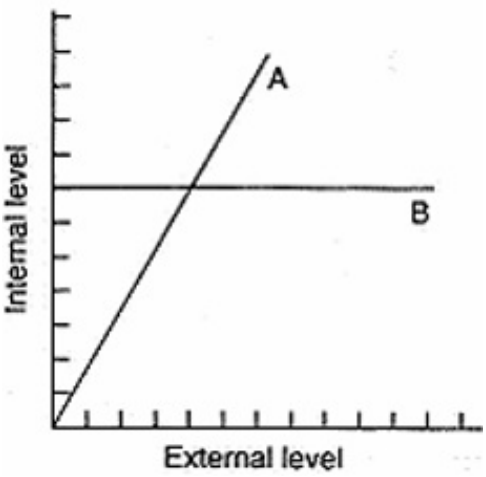
CBSE Test Paper 03

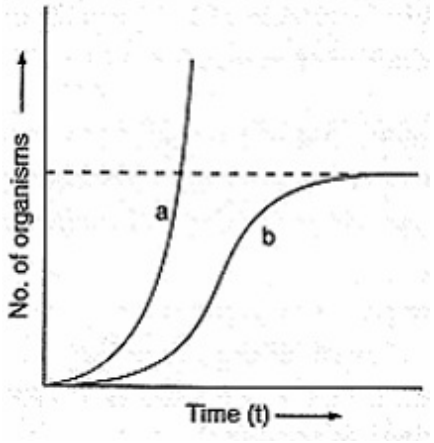
Ch-13 Organisms and Populations

1. In deep lakes;littoral,limnetic and profundal zones represent:
   a. community dynamism
   b. community stability
   c. community stratification
   d. trophic organization
2. CAM is a special photosynthetic pathway found to be present as adaptation within:
   a. Hydrophytes
   b. Photosynthetic bacteria
   c. Halophytes
   d. Xerophytes
3. Zone of Earth occupied by living organisms is called
   a. Flora and Fauna
   b. Biosphere
   c. Ecosystem
   d. Biome
4. Migration is an adaptation that should be categorised under
   a. Morphological attribute
   b. Physiological attribute
   c. Behavioural attribute
   d. Anatomical attribute
5. Which statement explains amensalism?
   a. Both species are harmed
   b. One species is benefitted while other is not affected
   c. One species is harmed while other is not affected
   d. Both species are benefitted
6. How does the increase and the decrease in the value of r affect the population size?
7. Given below is a graph depicting organismic response to changing external conditions. According to their response, the organisms are grouped into two types. Name the type which will show

i. Pattern A
ii. Pattern B.



8. In the given population growth curve.



i. What is the status of food and space in the curves (a) and (b)?
ii. In the absence of the predators, which curve (a) or (b) would appropriately depict the prey population?

9. Define the following terms:
(a) Leaching
(b) Photoperiodism

10. Write an equation for Verhulst Pearl logistic Growth, where
N = Population density at a time t
t = Intrinsic rate of natural increase and
K = Carrying capacity

11. Most living organisms cannot survive at temperature above 45°C. How are some microbes able to live in habitats with temperatures exceeding $100^{\circ} C$?

12. Write a short note on: Importance of light to plants

13. How is diapauses different from hibernation?

14. Ajay a notorious boy often involved in destruction of surrounding plants and killing small animals. You are given a responsibility to make him understand about importance of each and every organism present in world. How can you explain him about it and which hypothesis you will use for it?

15. Write a short note on: Adaptations of plants to water scarcity

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Answer

1. a. community stratification, **Explanation:** In deep lakes differenet zones are formed according to availabilityof light, food and temperature. These zones are called littoral, limnetic and profundal zone. It is a kind of community stratification or separation.
2. a. Xerophytes, **Explanation:** Crassulacean acid metabolism photosynthesis pathway is present as adaptation in xerophytes in which stomata opens during night to prevents loss of water by transpiration.
3. a. Biosphere, **Explanation:** The zone of earth occupied by living organism is called biosphere. It includes, lands, water and air where living organisms survive.
4. a. Behavioural attribute, **Explanation:** The organisms move away temporally from stressful habitat to more suitable habitat is called migration. Migration adaptation is a behavioral attribute.
5. a. One species is harmed while other is not affected, **Explanation:** One type of relationship that has been classified by biologists and ecologists is amensalism. Amensalism is any relationship between organisms of different species in which one organism is inhibited or destroyed while the other organism remains unaffected.
6. Increase in 'r' increases the population size while decrease in 'r' decreases the population size.
7. A. Conformers
   B. Regulators
8. i. There is sample food and space for the population depicted by curve
   a. When the resources are unlimited, the curve is exponential. There are limiting food and space for the population depicted by curve
   b. When the resources are limiting, the curve becomes sigmoid.

ii. In the absence of predators, curve (a) would appropriately depict the prey population.

9.

a. The removal or downward movement of soluble chemicals from soil by water is called leaching.

b. The response of organism to number and duration of day lengths is called as photoperiodism.

10. The logistic equation (sometimes called the Verhulst model or logistic growth curve) is a model of population growth first published by Pierre Verhulst (1845, 1847). The model is continuous in time, but a modification of the continuous equation to a discrete quadratic recurrence equation known as the logistic map is also widely used.

    The continuous version of the logistic model is described by the differential equation

    $\frac{dN}{dt} = rN\left(\frac{K-N}{K}\right)$

11. The microbes of high temperature area are known as thermo acidophiles. They are able to survive at high temperature through.

    i. Reduction in amount of free water.

    ii. Occurrence of branched-chain lipids that reduce fluidity of cell membranes.

12. **Importance of light to plants:** Since plants produce food through photosynthesis, a process which is only possible when sunlight is available as a source of energy, we can quickly understand the importance of light for living organisms, particularly autotrophs. Many species of small plants (herbs and shrubs) growing in forests are adapted to photo-synthesise optimally under very low light conditions because they are constantly overshadowed by tall, canopied trees. Many plants are also dependent on sunlight to meet their photoperiodic requirement for flowering.

13. **Diapause:**

    Hibernation (Winter sleep):

- It is a dormant stage in the development of an organism.
- It occurs both in summer and winter.
- During this period there is reduction in the amount of free water.
- It is common among insects such as monarch butterflies, and in the embryos of many of the oviparous species of fish in the order Cyprinodontiformes.
- It is a state of inactivation in an ectothermic mature organism.
- It occurs only in winter. It is winter sleep in which animal passes the winter period in dormant condition.
- There is no such adaptation.
- Californian pocket mouse and kangaroo mouse and bats are known to hibernate. Several insects, small birds and mammals hibernate regularly each year.

14. Explanation through "Rivet popper hypothesis.
    Values
    • Social responsibility
    • Concerns about eco system.

15. **Adaptations of plants to water scarcity:** Plants in water scarce area are called xerophytes. Adaptations of xerophytes include reduced permeability of the epidermal layer, stomata and cuticle to maintain optimal amounts of water in the tissues by reducing transpiration, adaptations of the root system to acquire water from deep underground sources or directly from humid atmospheres (as in epiphytic orchids), and succulence, or storage of water in swollen stems, leaves or root tissues. The typical morphological consequences of these adaptations are collectively called xeromorphisms.