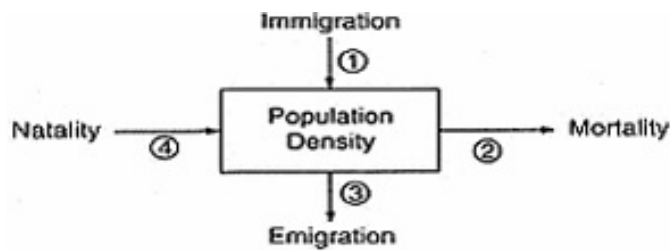
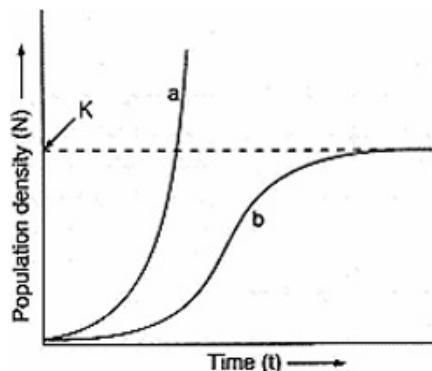


CBSE Test Paper 02
Ch-13 Organisms and Populations

1. How will you represent a stable population?
 - a. as a pyramid with broad base
 - b. a structure showing larger proportion of young individuals
 - c. a pyramid showing large proportion of older individuals
 - d. as a bell shaped polygon
2. Which of the following statements is/are incorrect:
 - a. Temperature is critical to living organisms for metabolism
 - b. Human intestine cannot be considered a unique habitat
 - c. Organisms need adaptations to optimize their survival and reproduction in their habitat
 - d. Carbon dioxide is necessary for photosynthesis
3. Studies had revealed that human population growth curve is
 - a. S-shaped
 - b. F-shaped
 - c. J-shaped
 - d. U-shaped
4. Actual birth rate under environmental conditions is much less and is thus also called:
 - a. biotic potential
 - b. vital index
 - c. potential natality
 - d. Realised natality
5. A gut parasite will not need
 - a. high reproductive capacity
 - b. resistant eggs
 - c. an alimentary canal
 - d. adhesive organs
6. Which of the following represent an increase or decrease in population



7. In the process of nitrogen fixation, plants contribute carbon to bacteria that are capable of fixing atmospheric N_2 gas, and the bacteria can supply the plants with a usable form of nitrogen.
8. Draw a growth curve where resources are not limiting to growth of a population.
9. Why is predation required in a community of different organisms?
10. List any two adaptive features evolved in parasites enabling them to live successfully on their hosts.
11. When and why do some animals like frogs hibernate?
12. Name the type of curve that characterizes most populations growing in favourable environment. Define carrying capacity.
13. Study the population growth curves in the graph given below and answer the questions which follow?



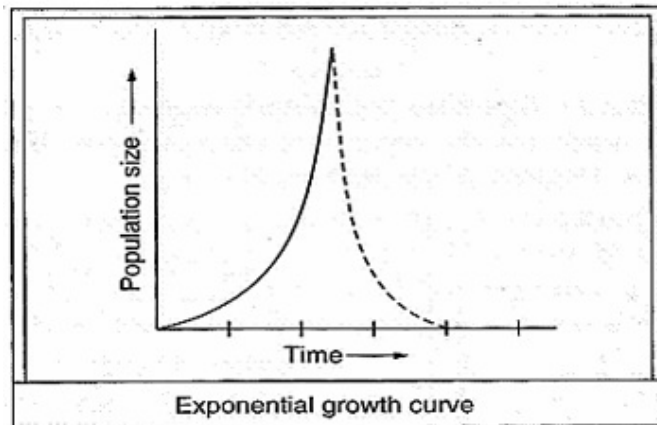
- i. Identify the growth curves 'a' and 'b'.
- ii. Which one of them is considered a more realistic one and why?
- iii. If $\frac{dN}{dt} = rN \left(\frac{K-N}{K} \right)$ is the equation of the logistic growth curve, what does K stand for?
- iv. What is symbolized by N?
14. How do organisms like fungi, zooplanktons and bears overcome the temporary short lived climatic stressful conditions? Explain.
15. With the help of suitable diagram describe the logistic population growth curve?

CBSE Test Paper 02
Ch-13 Organisms and Populations

Answer

1. d. as a bell shaped polygon, **Explanation:** Stable populations are theoretical models widely used by demographers to represent and understand the structure, growth and evolution of human populations. By definition, stable populations have age-specific fertility and mortality rates that remain constant over time.
Age pyramids generally shows age distribution of male and female in combined diagram. The stable population shows a bell shaped polygon.
2. b. Human intestine cannot be considered a unique habitat, **Explanation:** Inside the human intestine a number of microbes live that helps in digestion of food and formation of vitamin K. so, human intestine is also a unique habitat.
3. a. S-shaped, **Explanation:** Human population growth curve is S-shaped in which at initial stage growth is slow followed by exponential growth and finally again start declining to follow sigmoid curve growth.
4. d. Realised natality, **Explanation:** Natality or birth rate is the number of births in a given period in the population that are added to initial population. Actual birth rate under environmental condition is much less than total birth because all organisms do not survive adulthood due to predation, competition etc.
5. c. an alimentary canal, **Explanation:** The parasite obtains their food from host body. Gut parasite like round worm and tap worm absorb digested food from our body. They do not require alimentary canal as they absorb digested food.
6. 1 and 4 - increase
2 and 3 - decrease
7. This is an example of mutualism. Mutualism is the way two organisms of different species exist in a relationship in which each individual benefits from the activity of the other. Similar interactions within a species are known as co-operation.

8.



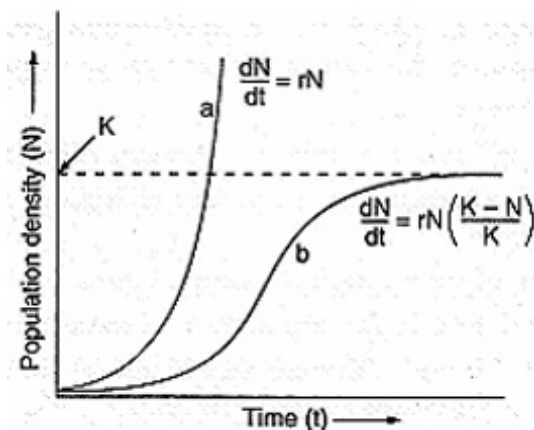
9. - They help in maintaining species diversity in a community, by reducing the intensity of competition.
 - They keep the prey population under control
 - It acts as a conduit for energy transfer across trophic levels.
10. - Presence of adhesive organs or suckers to cling on the host
 - Loss of digestive system and high reproductive capacity
11. It is very difficult for most animals to find enough food in winters when the main source of food like insects or green plants is in short supply. Some animals solve this problem by hibernating. Hibernation is a deep sleep adaptation mechanism that helps such animals to save energy and survive the winter without consuming much food. Many physiological changes occur in the body of the animals during hibernations where the animal's body temperature drops and its heartbeat and its breathing slow down so that energy can be conserved.
12. - Sigmoid curve
 - In nature a given habitat has enough resources to support a maximum possible number of population, beyond which no further growth of the population is possible. This limit is called as nature's carrying capacity (K) for that species in that habitat.
13. i. a. T-shaped, exponential growth curve
 b. S-shaped logistic / sigmoid growth curve
 ii. Curve b is more realistic because food for the animals is finite and so will soon become a limiting factor
 iii. 'K' is the carrying capacity of the area
 iv. 'N' is population density at time
14. Fungi produce thick walled spores which help them to survive during stressful conditions. They germinate on availability of favourable environment.
 - Many zooplankton species in lakes and ponds are known to enter - diapause.

- Bears undergo hibernation (winter sleep) to escape winter.

15. The logistic population growth curve is commonly observed in yeast cells that are grown under laboratory conditions.

It includes five phases: the lag phase, positive acceleration phase, exponential phase, negative acceleration phase, and stationary phase.

- **Lag phase:** Initially, the population of the yeast cell is very small. This is because of the limited resource present in the habitat.
- **Positive acceleration phase:** During this phase, the yeast cell adapts to the new environment and starts increasing its population. However, at the beginning of this phase, the growth of the cell is very limited.
- **Exponential phase:** During this phase, the population of the yeast cell increases suddenly due to rapid growth. The population grows exponentially due to the availability of sufficient food resources, constant environment, and the absence of any interspecific competition. As a result, the curve rises steeply upwards.
- **Negative acceleration phase:** During this phase, the environmental resistance increases and the growth rate of the population decreases. This occurs due to increased competition among the yeast cells for food and shelter



- **Stationary phase:** During this phase, the population becomes stable. The number of cells produced in a population equals the number of cells that die. Also, the population of the species is said to have reached nature's carrying-capacity in its habitat. A Verhulst–pearl logistic curve is also known as an S-shaped growth curve.