



BIOLOGY

BOOKS - PRADEEP BIOLOGY (HINGLISH)

ORGANISMS AND POPULATIONS

Curiosity Questions

1. Which animals use metabolic water ?

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2. Why are the producers not found in profundal zone in aquatic bodies ?

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3. Do the homeotherms show weather-dependent migrations ?

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4. Why are the fresh-water animals unable to live in the sea water ?

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5. What is the concept of the optimum ?

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6. What is the motive of altruism in animals ?

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7. What are antcows ?

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8. How are the pheromones detected ?

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9. Do the animals emit electric signals ?

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10. What does the term "symboisis" now mean ?

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11. How are the bacteria normally living in the human colon beneficial ?

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12. Why do parasites tend to lose certain organs ?

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Ncert Exercises With Answers

1. How is diapause different from hibernation?

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2. Define phenotypic adaptation. Give one example.



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



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4. List the attributes that populations but not individuals possess.



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5. If a population growing exponentially double in size in 3 years, what is the intrinsic rate of increase (r) of the population?



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6. Name important defense mechanisms in plants against herbivory.

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7. An orchid plant is growing on the branch of mango tree. How do you describe this interaction between the orchid and the mango tree?

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8. What is the ecological principle behind the biological control method of managing with pest insects?

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9. Distinguish between the following:

(a) Hibernation and Aestivation

(b) Ectotherms and Endotherms



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10. Write a short note on :

(a) Adaptations of desert plants and animals

(b) Adaptations of plants to water scarcity

(c) Behavioural adaptations in animals

(d) Importance of light to plants

(e) Effect of temperature or water scarcity and the adaptations of animals.



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11. List the various abiotic environmental factors .

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12. Give an example for:

- (a) An endothermic animal
- (b) An ectothermic animal
- (c) An organism of benthic zone .

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13. Define population and community.

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

(a) Commensalism

(b) Parasitism

(c) Camouflage

(d) Mutualism

(e) Interspecific competition



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15. With the help of suitable diagram describe the logistic population growth curve.



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16. Select the statement which explains best parasitism.

(a) One organism is benefited.

(b) Both the organisms are benefited.

(c) One organism is benefited, other is not affected.

(d) One organism is benefited, other is affected.

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17. List any three important characteristics of a population and explain.

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Additional Questions Very Short Answer Questions

1. The role of an organism in ecological system is known as

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2. Adaptation to low temperature and freezing in animals occurs due to the production of:-

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3. Name the two main types of environmental factors .

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4. What does the term "biota " mean ?

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5. What are stenothermal animals ?

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6. Give two examples of homeotherms .

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7. The ecological levels of organization , in terms of complexity , are arranged in the order

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8. The kangaroo rat and camel adapt to dry and hot conditions in the deserts by

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9. Define the following :

(a) Ecology

(b) Environment

(c) Lapse rate

(d) Microhabitat

(e) Habitat

(f) Ecological niche

(g) Climate

(h) Weather

(i) Wind throw

(j) Lodging

(k) Littoral zone

(l) Limnetic zone

(m) Profundal zone

(n) Benthic zone



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10. What are eurythermal organisms ?



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11. Name the bird which undertakes migration from north pole to south pole and back .

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12. Name two dominant plant species of mangrooves .

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13. What are ephemerals ?

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14. How does green alga *Dunaliella* tolerate hypersaline conditions ?

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15. Define thermocline .

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16. Give example of each of the following :

- (a) Batesian mimicry
- (b) Mullerian mimicry
- (c) Aggressive mimicry
- (d) Feigning death mimicry .

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17. What are ecotypes ?

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18. Shade plants are also termed..... .

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19. Sun loving plants are

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20. Plants adapted to water scarcity and heat are called

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21. Name any two free floating hydrophytes .

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22. Define Heterophylly .

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23. Name the aquatic plant which reveals heterophylly .

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24. What are mycorrhizae ?

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25. Name two animals depicting metamorphic migrations .

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26. Name the animal showing periodic migrations .

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27. Name the animal which finds its path using echolocation phenomenon.

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28. What is the carrying capacity of environment ?

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29. Give the formula for determining the population density of a place .

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30. Define 'zero population growth rate'. Draw a age pyramid for the same.

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31. How many phases are there is an S-shaped growth curve ?

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32. What does the sigmoid growth curve of a population mean ?

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33. What does J-shaped growth curve of a population indicate?

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34. Parasite can be explained as an organism which depends on others :

(a) for food (b) for shelter (c) for both food and shelter , and (d) for reproduction .

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35. Select the statement which best explains commensalism

(a) One organism is benefitted (b) Both the organisms are benefitted
(c) One organism is benefitted , other is not affected (d) One organism is benefitted , other is affected .

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36. What is the literal meaning of the term symbiosis ?

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37. Which organisms help termites in the digestion of cellulose ?

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38. Name the organisms that form lichens .

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39. Name the a blue green algae and a bacterium which fix atmospheric nitrogen.

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40. What is the source of penicillin ?



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41. Name the pathogen that causes dysentery.

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42. Give names of two insectivorous plants .

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43. Mention one larvicidal fish .

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44. What type of relationship exists between sea anemone and hermit crab .

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45. Mention the host of *Taenia solium* .

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46. Give two alternate terms for biotic community .

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47. How nature controls aphid infestation of plants ?

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48. How long a primary succession takes to complete ?

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49. Which bacteria live on the human skin ?



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50. Name two artificial biotic communities .



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51. Fill in the blanks : (a) The aggregation of individuals of species is called

(b) The relationship where one organism is benefitted , while the other is neither benefitted nor harmed , is referred as

(c) Organisms preying on animals are called

(d) An association of two species in which both species are benefitted is called



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52. Select the statement which best explains commensalism:-

- A. One organism is benefitted .
- B. Both the organisms are benefitted .
- C. One organism is benefitted , other is not affected
- D. One organism is benefitted , other is affected .

Answer: c



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53. Community is defined an aggregation of:-

- A. Individuals of the same kind
- B. Individuals of different kinds

C. Individuals of a population

D. Populations of different species

Answer: d

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54. Parasite can be explained as an organism which depends on others:-

A. for food

B. for shelter

C. for both food and shelter

D. for reproduction

Answer: c

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55. List any two adaptive features evolved in parasites enabling them to live successfully on their hosts .

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56. When and why do some animals like snails go into aestivation ?

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57. Mention any two significant roles predation plays in nature.

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58. Why is the polar region not a suitable habitat for tiny humming birds ?



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59. If 8 individuals in a laboratory population of 80 fruit flies died in a week, then what would be the death rate for population for the said period ?

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60. In a pond there were 20 Hydrilla plants. Through reproduction 10 new Hydrilla plants were added in a year. Calculate the birth rate of the population.

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61. Species that can tolerate narrow range of temperature are called.....

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62. What are eurythermic species?

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63. Species that can tolerate wide range of salinity are called

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64. Write the basis on which an organism occupies a space in its community/natural surroundings.

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65. Give an example of an organism that enters 'diapause' and why.

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66. Define Diapause.

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Short Answer Questions

1. Name one organism for each of the 3 categories of organisms regarding their mode of obtaining food .

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2. Neutral Day Plants

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3. What are crepuscular animals ? Cite an example .



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4. Give the meaning and examples of epizoic animals .



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5. Define the term 'adaptation'



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6. DIFFERENCE BETWEEN WEATHER AND CLIMATE



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7. Distinguish between camouflage and mimicry .

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8. Define the following terms :

- (a) Migration
- (b) Stratosphere
- (c) Community
- (d) Biosphere

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9. Define the following terms : (a) Mimicry (b) Acclimatization (c) Ectotherms (d) Endotherms

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10. Distinguish between habitat and ecological niche.

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11. Give the ecological adaptations of succulents.

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12. Write adaptation of submerged , rooted hydrophytes .

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13. Give adaptations of animals to water scarcity .

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14. What are heliophytes . Give their major characteristics.

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15. Write Characteristics of A-horizon of soil .

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16. Briefly give characteristic zones of a aquatic body , e.g., lake .

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17. Give the formula for the change in population size .

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18. How do the genus and community differ ?

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19. What are antagonistic interactions . Cite a few examples .

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20. Give two examples of symbiosis among humans.

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21. What are saprobionts ? Give examples .

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22. What are hyperparasites ? Mention a specific case.

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23. Difference between saprotrophs and phagotrophs .

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24. What is meant by the term plankton ?

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25. List the ecological principles operating in a pond .

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26. What are producers and consumers ?

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27. What is a mimic ?

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28. Define population and community.

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29. How is a biotic community name ? Give examples .

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30. How do you distinguish the following ?

- (a) Ecotones and edge effect
- (b) Keystone species and critical link species
- (c) Ectoparasite and Endoparasite

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31. Name the interaction in each of the following:

- (a) Cuckoo lay: her eggs in the crew's nest.
- (b) Orchid grows on a mango tree.
- (c) Ticks live on the skin of doze.
- (d) Sea anemone in often found on the shell of hermit crab?

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32. Name the interaction in each of the following :

(a) Cuscuta growing on a shoe flower plant.

(b) Mycorrhizae living on the roots of higher plants

(c) Clown fish living among the tentacles of sea anemone

(d) Koel laying her eggs in crow's nest .



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33. Name the interaction in each of the following :

(a) Ascaris worms living in the intestine of human

(b) Sucker fish attached to the shark

(c) Smaller barnacles disappeared when Balanus dominated in the coast of Scotland



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34. Certain species wasps are seen to frequently visit flowering fig trees .

What type of interaction is seen between them and why ?

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35. The 'clown' fish lives among the tentacles of sea anemone. What is this interaction between them called and why ?

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36. Egrets are often seen along with grazing cattle . How do you refer to this interaction ? Give a reason for this association .

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37. Give two examples each of the following :

(i) Ephemerals (drought escapers) (ii) Succulents (drought resistant)

(iii) Free floating hydrophytes (iv) Submerged floating hydrophytes

(v) Mangrove plants

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38. List the features that make a stable biological community.

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39. (i) What is the interaction between two species called ?

(ii) Name the association in which one species produces poisonous substance or a change in environmental conditions that is harmful to another species .



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40. (i) What is commensalism ? (ii) What is mycorrhiza ?

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41. State Gause's Competitive Exclusion Principle.

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42. Define predation .

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43. Many fresh water animals can not survive in marine environment.

Explain.



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44. What is mutualism ? Mention any two examples where the organisms involved are commercially exploited in agriculture.

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45. Predation is usually referred to as detrimental association. State any three positive roles that a predator plays in an ecosystem.

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46. Difference Between Weather And Climate

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47. Explain the following terms :

(a) Acclimatisation (b) Ectotherms (c) Endotherms



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48. Explain how tolerance to environmental factors determines distribution of species .



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49. How do plants adapt to oligotrophic soils ?



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50. Write a note on consumers .



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51. What is threshold in reference to the range of tolerance of an organism to some environmental factor ?

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52. Write a note on daily rhythm of activity regarding light .

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53. How are the hydrophytes adapted to aquatic life ?

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54. Explain J-shaped pattern of population growth .

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55. Define the term population of dynamics or biotic potential .

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56. List any three important characteristics of a population and explain.

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57. Define the biotic community . How is it different from the term community used in human population.

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58. How is a biotic community name ? Give examples .



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59. What are the important analytic characteristics in community analysis ?



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60. Distinguish between camouflage and mimicry .



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61. Define ectoparasite and endoparasite and give suitable examples.



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62. Write some special characteristics of a parasite .



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63. Explain how predation is beneficial in the long run ?



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64. Animals and plants are interdependent . Justify this statement .



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65. Give one example of each of the following :

Protocooperation , Mutualism and Amensalism .



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66. How do the following differ ?

(a) Predator and scavenger (b) Mimic and model



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67. Name the kind of interaction between the following -

(a) Birds and cattle (b) Termites and flagellates (c) Alga and fungus

(d) Plasmodium and humans



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68. Will competition be more acute between individuals of the same species or those of different species ? Explain .



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69. In what way are the prey species benefitted by their products ?

Do scavengers which feed on the same species have the same effect

? Explain .

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70. What is mimicry ? Give its importance .

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71. Define Batesian mimicry . Give one example .

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72. What is parasitism ? Name the various types of parasites .

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73. Which bacteria inhabit human colon ? Give their role .



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74. Why the members of a population do not breed with other populations ?



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75. (a) Compare , giving reasons , the J- shaped and S- shaped models of population growth of a species.

(b) Explain " fitness of a species " as mentioned by Darwin.



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76. Write species characteristics of a parasite .

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77. Explain how predation is beneficial in the long run ?

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78. How do organisms manage with stressful conditions existing in their habitat for short duration? Explain with the help of one example each.

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79. Fill in the blanks :

(i) Oxylophytes are the plants growing on..... and

chasmophytes are the plants growing in

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80. Fill in the blanks :

Antarctic fish (Trematomus) can tolerate below $0^{\circ}C$ temperature by accumulating or that lower freezing point of their body fluids .

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81. Fill in the blanks :

Fishes showing migrations from sea water to fresh water for spawning are termed, fishes while those migrating from fresh water to sea water are called, fishes .

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82. Fill in the blanks :

Lemna is a hydrophyte and Ceratophyllum is a hydrophytes .

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83. Fill in the blanks :

Intraspecific interactions are of two types . These may be or

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84. Match the items given in column I with appropriate items (one or more) of column II .

Column I

- (i) Cacti
- (ii) Shade loving plants
- (iii) Halophytes
- (iv) Batesian mimicry
- (v) Mullerian mimicry
- (vi) Echolocation

Column II

- (a) Sciophytes
- (b) Plants growing in saline environment
- (c) Monarch butterfly and queen monarch
- (d) Bats
- (e) Monarch butterfly , viceroy butterfly
- (f) Xerophytes
- (g) Avicennia



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85. Fill in the blanks :

Population dispersion has two main patterns . These are and



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86. Fill in the blanks :

The number of individuals of a species in a particular area at a specific time is called while number of individuals of a

species present per unit area or volume at a given time is
.....

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87. Fill in the blanks :

..... is the natural ability of a population to increase at its maximum rate under ideal conditions. However , sum of factors called prevent a population from reproducing at its maximum rate .

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88. Fill in the blanks :

Population have characteristic patterns of growth with time . Two contrasting types of growth forms are and

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89. Fill in the blanks :

Interactions between individuals of same species are termed interactions and those between individuals of different species are termed interactions .

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90. Fill in the blanks :

Termites and flagellates illustrate type of interspecific interactions . Similarly , female mosquitoes and man illustrate type of interspecific interaction

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91. Fill in the blanks :

Succession that starts on a bare rock is called and

that which begins on sand is called



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92. Match the items given in column I with those given (one or more) in column II .

Column I

- (i) Crustose lichen
- (ii) Interspecific interaction
- (iii) Rhizobium and Leguminous plants
- (iv) Bombykol
- (v) Intraspecific interaction

Column II

- (a) Commensalism
- (b) Mutualism
- (c) Pioneer community
- (d) Parental care
- (f) Amensalism
- (g) Lithosphere



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93. In a sea shore, the benthic animals live in sandy, muddy and rocky substrate and accordingly developed the following adaptations.

- (a) Burrowing
- (b) Building cubes

(c) Holdfasts/peduncle

Find the suitable substratum against each adaptation.



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94. Categorise the following plants into hydrophytes, halophytes, mesophytes and xerophytes. Give reasons for your answers.

(a) Salvinia (b) Opuntia

(c) Rhizophora (d) Mangifera



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95. In a pond, we see plants which are free-floating, rooted-submerged, rooted emergent, rooted with floating leaves. Write

the type of plants against each of them .

Plant Name	Type
(a)Hydrilla	_____
(b)Typha	_____
(c)Nymphaea	_____
(d)Lemna	_____
(e)Vallisnaria	_____

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96. The density of a population in a habitat per unit area is measured in different units. Write the unit of measurement against the following

- (a) Bacteria
- (b) Banyan
- (c) Deer
- (d) Fish

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97. Define 'zero population growth rate'. Draw a age pyramid for the same.

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98. Water is essential for life . Write any three features both for plants and animals which enable them to survive in water scarce environment .

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99. How do organisms manage with stressful conditions existing in their habitat for short duration? Explain with the help of one example each.

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100. Write a note on predation and its ecological significance.

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101. Explain mutualism with the help of any two examples. How is it different from commensalism?

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102. a) Write the importance of measuring the size of a population in a habitat or an ecosystem.

b) Explain with the help of an example how the percentage cover is a more meaningful measure of population size than mere numbers.

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103. a) Explain "birth rate" in a population by taking a suitable example.

b) Write the other two characteristics which only a population shows but an individual cannot.

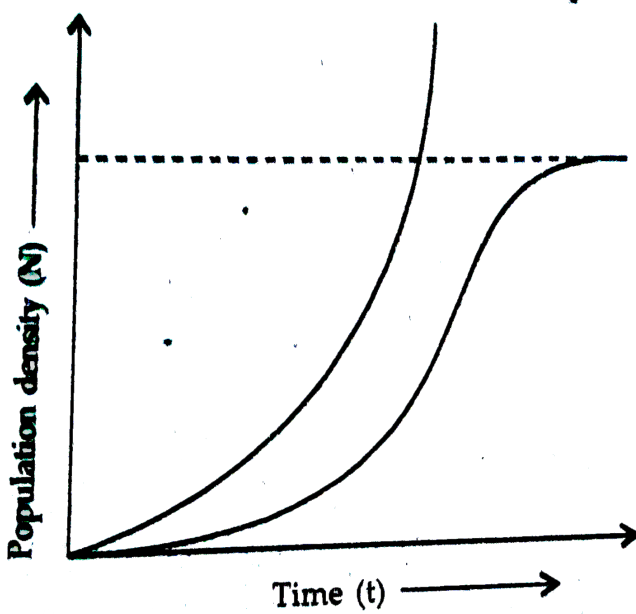
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104. a) Explain "death rate" in a population by taking a suitable example.

b) Write the other two characteristics which only a population shows but an individual cannot.

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105. Study the graph given below and answer the questions that follow:



- i) Write the status of food and space in the curves a) and b).
- ii) In the absence of predators, which one of the two curves would appropriately depict the prey population?
- iii) Time has been shown on X-axis and there is a parallel dotted line above it. Give the significance of this dotted line.

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106. How do snails, seeds, bears, zooplanktons, fungi and bacteria adapt to conditions unfavourable for their survival ?



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107. Explain co-evolution with reference to parasites and their hosts. Mention any four special adaptive features evolved in parasites for their parasitic mode of life.



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108. (a) " Organisms may be conformers or regulators ." Explain this statement and give one example of each.

(b) Why are there more conformers than regulators in the animals world ?



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109. Different animals respond to changes in their surroundings in different ways . Taking one example each explain some animals indergo aestivation while some others hibernation " .How do fungi respond to adverse climatic conditions ?

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110. How do kangaroo rats and desert plants adapt themselves to survive in their extreme habitat ? Explain .

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111. a) What is an age-pyramid?

b) Name three representative kinds of age-pyramids for human population and list the characteristics for each one of them.

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112. (a) In a pond there were 200 frogs , 40 more were born in the year . Calculate the birth rate of the population.

(b) Population in terms of number is not always a necessary parameter to measure population density . Justify with two examples .

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Long Answer Questions

1. Describe environmental factors and their importance to plants and animals .

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2. How do plants adapt to oligotrophic soils ?



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3. What are the different types of adaptations in animals ? Explain with suitable examples .



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4. Discuss the biotic factors of environment .



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5. Describe the role of light on organisms.



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6. Explain the influence of light on plants and animals .



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7. How does wind affects the organisms ?



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8. Describe the range of tolerance of organisms to an enviroment factor.



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9. How can age-sex structure of a population be depicted in a pyramid diagram ?



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10. Describe the S-Shaped growth curve . How is it different from the J-shaped growth curve ?

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11. Draw population growth curves and explain them .

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12. How are the concepts of biotic potential , environmental resistance and carrying capacity related population growth ?

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13. Whate are negative interactions in a biotic community ? Mention their types . Describe any one of these .

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14. Describe a biotic community (near your school or home) stating relationships that exist between the common species comprising it .

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15. On what does the stability of a biological community depend ?

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16. List the characteristics of a biotic community .

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17. Give an account of biotic stability.



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18. Draw and explain a logistic curve for a population of density (N) at time (t) whose intrinsic rate of natural increase is (r) and carrying capacity is (k).



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19. (a) Why are herbivores considered similar to predators in the ecological context ? Explain.

(b) Differentiate between the following interspecific interactions in a population :

(i) Mutualism and Competition.

(ii) Commensalism and Amensalism.

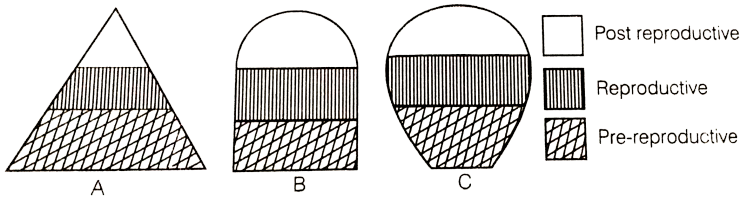


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20. If $p^a = q^b = r^c = s^d$ and p, q, r, s are in G.P then a, b, c, d are in

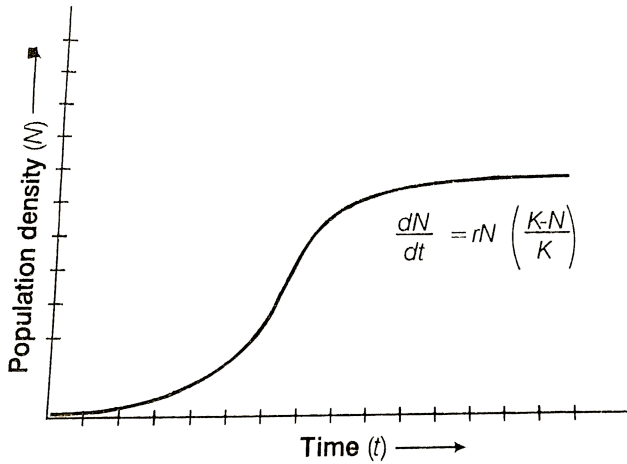
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21. The following diagrams are the age pyramids of different populations. Comment on the status of these populations.



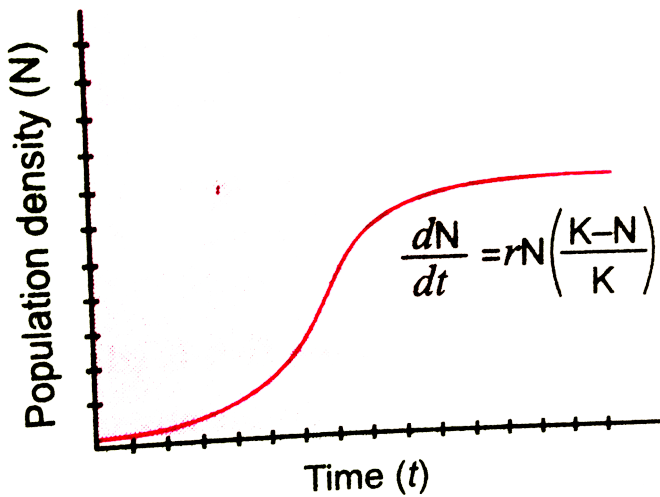
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22. Comment on the growth curve given below.



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23. Discuss various types of interspecific interactions found among populations .



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24. "Analysis of age-pyramids for human population can provide important inputs for long-term planning strategies" Explain .

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25. List the different attributes that a population has and not an individual organism.

(b) What is population density? Explain any three different ways the

population density can be measured ,with the help of an example each .

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26. (a) Name the two growth models that represent population growth and draw the respective growth curves they represent.

(b) State the basis for the difference in the shape of these curves.

(c) Which one of the curves represent the human population growth at present? Do you think such a curve is sustainable ? Give reason in support of your answer.

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27. (a) Compare , giving reasons , the J- shaped and S- shaped models of population growth of a species.

(b) Explain " fitness of a species " as mentioned by Darwin.

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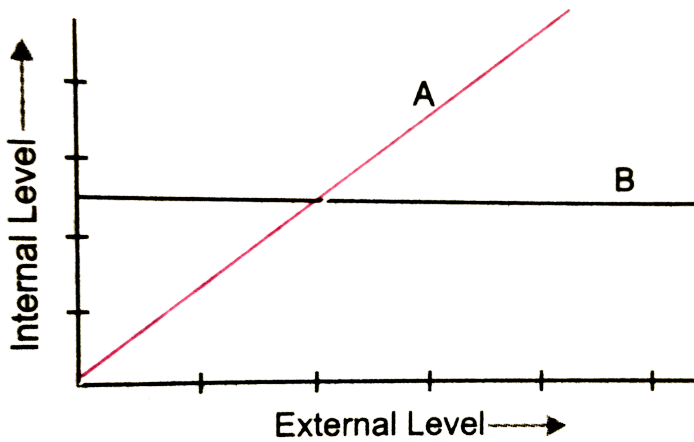
28. (a) Following are the response of different animals to various abiotic factors . Describe each one with the help of an example .

(i) Regulate (ii) conform (ii) Migrate (iv) Suspend

(ii) If 8 individuals in a population of 80 butterflies die in a week , calculate the death rate of population of butterflies during that period .

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29. The graph given below represents the organisms reponse to temperature as an environmental conditions :



- (i) Which one of the two lines represents conformers and why ?
 - (ii) What does the other line in the graph represent and why ?
- (b) Mention the different adaptations the parasites have evolved with , to be able to successfully complete their life cycle in their hosts.

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Analytical Questions With Answers

1. If a marine fish is placed in a fresh water aquarium, will the fish be able to survive? Why or why not?

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2. How is a monoculture disadvantageous ?

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3. How do proto cooperation and mutualism resemble and differ ?

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4. What is allelopathy ? Cite one example .

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5. When and why do some animals like frogs hibernate ?

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6. (a) What is 'r' in the population equation given below : $dN/dt = rN$

(b) How does the increase and the decrease in the value of 'r' affect the population size.

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7. Explain why very small animals are rarely found in polar region.

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8. Why are coral reefs not found in the regions from West Bengal to Andhra Pradesh but are found in Tamil Nadu and on the east coast

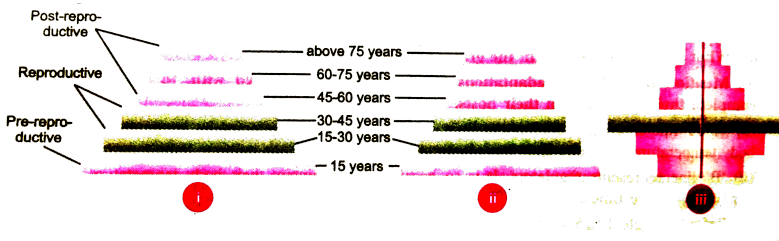
of India?

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9. Why is the thermoregulation more effectively achieved in larger animals than in smaller ones ?

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10. Study the 3 representative figures of age pyramid relating to human population given below and answer the questions .



(a) Mention the names given to 3 kinds of age profiles (i) , (ii) and (iii)

(b) Which one of them is ideal for a population and why ?

(c) How do such age-profile studies help policy makers get concerned about our growing population and prepare for future planning

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11. (a) Write an equation for Verhulst Pearl logistic . Growth where

N = Population density at a time t

r = Intrinsic rate of natural increase

K = Carrying capacity

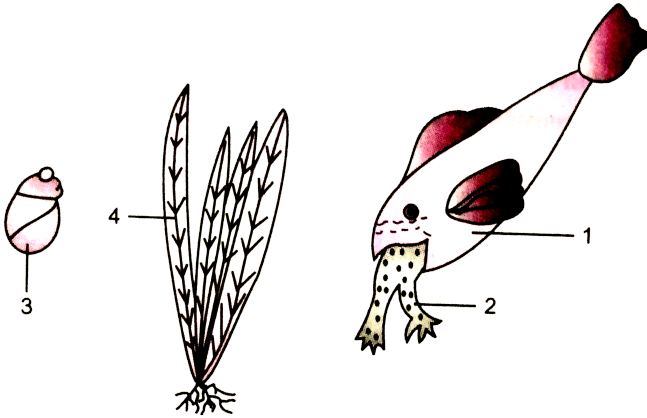
(b) Draw a graph for a population whose population density has reached the carrying capacity .

(c) Why is the logistic growth model considered a more realistic one for most animal populations ?

(d) Draw a growth curve where resources are not limiting to growth of a population.

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12. In the given picture what is the relationship between (1) and (2) with respect to population interaction and between (3) and (4) with respect to trophic levels ?



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13. The range of tolerance to the variations in each environmental factor varies greatly in different species .

Name the terms used for species

(i) Which live in regions of nearly uniform temperature throughout the year and showing narrow range to tolerance to temperature changes .

(ii) which live in areas where temperature changes significantly at different times of the year and showing wide range of tolerance to temperature changes .

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14. What is the function of hairy coat in most mammals , blubber in whales and seals and feathers , birds ? How do these animals regulate their body temperature ?

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15. How do following animals avoid predation from predators ? Name the behavioural adaptation in each and also explain this behaviour.

(i) Tenebrinoid beetles

(ii) Praying mantis

(iii) Viceroy butterfly

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16. A liverwort plant is unable to complete its life cycle in a dry environmental . State two reasons.

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17. Alien species are a threat to native species. Justify taking example of an animal and a plant alien species.

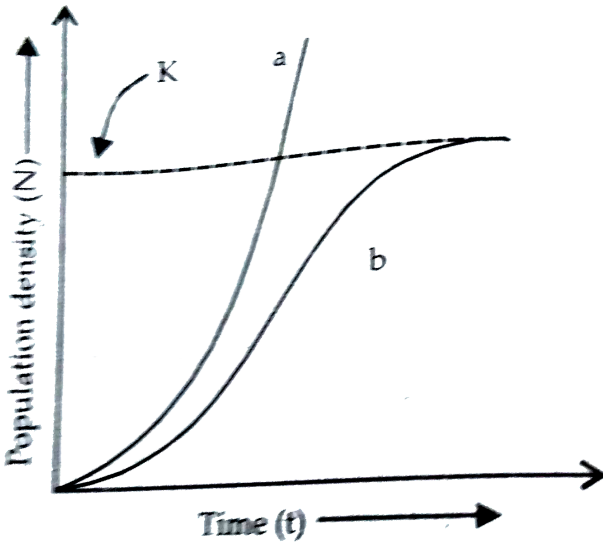
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18. Why are decomposers essential in nature ?

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19. 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 ?

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 symbolised by N ?

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20. Give an example of an organism that enters 'diapause' and why.

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Practice Questions | Multiple Choice Questions

1. Lichens are well known combination of an alga and a fungus where fungus has

- A. an epiphytic relationship with the alga
- B. a parasitic relationship with the alga
- C. a symbiotic relationship with the alga
- D. a saprophytic relationship with alga

Answer: C

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2. Maximum growth rate occur in

- A. senescent phase
- B. lag phase
- C. exponential phase
- D. stationary phase

Answer: C



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3. The zone of atmosphere that lies near the ground is:

- A. Stratosphere
- B. Mesosphere

C. Troposphere

D. Thermosphere

Answer: C



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4. In which one of the following habitats does the diurnal temperature of soil surface vary most?

A. Forest

B. Desert

C. Grassland

D. Shrub land

Answer: B



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5. Photosynthetically active radiation (PAR) represents the following range of wavelength

- A. 450-950 nm
- B. 340-450 nm
- C. 400-700 nm
- D. 500-600 nm

Answer: C

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6. A terrestrial animal must be able to

- A. Conserve water
- B. Actively pumps salts out through the skin

C. Excrete large amounts of salt in urine

D. Excrete large amounts of water in urine

Answer: A



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7. What is a keystone species?

A. A common species that has plenty of biomass , yet has a fairly

low impact on the community's organization

B. A rare species that has minimal impact on the biomass and on

other species in the community

C. A dominant species that constitutes a larger proportion of the

biomass and which affects many other species

D. A species which makes up only a small proportion of the total biomass of a community , yet has a huge impact on the community's organization and survival.

Answer: D

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8. The term "ecology" was given by

A. Odum

B. E. Munch

C. Tansley

D. Reiter

Answer: D

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9. Animals have the innate ability to escape from predation. Examples for the same are given below. Select the incorrect example.

- A. colour change in chameleon
- B. enlargement of body size by swallowing air in puffer fish
- C. poison fangs in snakes
- D. melanism in moths

Answer: C

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10. The ability of the venus fly trap to capture insects is due to

- A. specialized muscle-like cells
- B. chemical stimulation by the prey

C. a passive process requiring no special ability on the part of the plant

D. rapid turgor pressure changes

Answer: D



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11. The presence of diversity at the junction of territories of two different habitats is known as

A. bottle neck effect

B. edge effect

C. junction effect

D. pasteur effect

Answer: B

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12. 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. commensalism

C. predation

D. parasitism

Answer: B

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13. Pneumatophores are found in

A. xerophytes

B. hygrophytes

C. mesophytes

D. halophytes

Answer: D



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14. Which on one of the following correctly represents an organism and its ecological niche?

A. Vallisneria and pond

B. direct locust (*Scistocerca*) and desert

C. plant lice (aphids) and leaf

D. vultures and dense forest

Answer: C

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15. Annual migration does not occur in case of

- A. arctic tern
- B. salmon
- C. siberian crane
- D. salamander

Answer: D

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16. The formula for exponential population growth is

- A. $dN/dt = r N$
- B. $dt/dN = r N$

C. $dN/rN = dt$

D. $r N/dN = dt$

Answer: A

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17. Niche overlap indicates

A. mutualism between two species

B. active cooperation between two species

C. two different parasites on the same host

D. sharing of one or more resources between the two species

Answer: D

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18. Praying mantis is a good example of

- A. camouflage
- B. mullerian mimicry
- C. warning colouration
- D. social insects

Answer: A



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19. Animals spending winter in dormant conditons is referred as under

- A. aestivation
- B. hibernation
- C. adaptation

D. acclimitisation

Answer: B

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20. Keystone species deserve protection because these

- A. are capable of surviving in harsh environmental conditions
- B. indicate presence of certain minerals in the soil
- C. have become rare due to overexploitation
- D. play an important role in supporting other species

Answer: D

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21. Geometric representation of age structure is a characteristic of :

- A. populations
- B. landscape
- C. ecosystem
- D. biotic community

Answer: A



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22. The population of an insect species shows an explosive increase in numbers during rainy season followed by its disappearance at the end of the season. What does this show ?

- A. the food plants mature and die at the end of the rainy season
- B. its population growth curve is of J-type

C. the population of its predators increase enormously

D. S-shaped or sigmoid growth of this insect

Answer: B



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23. A high density of elephant population in an area can result in

A. intra-specific competition

B. inter-specific competition

C. predation on one another

D. mutualism

Answer: A



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24. Humus is formed in

A. horizon-A

B. horizon-O

C. horizon-B

D. horizon-C

Answer: B



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25. Population density of terrestrial organisms is measured in terms of individual per :

A. metre³

B. metre⁴

C. meter

D. meter²

Answer: D



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26. Which are true about the following statements about kangaroo rats

(a) They have dark colour, high rate of reproduction and excrete solide urine

(b) They do not drink water, breathe at slow rate, and have their body covered with thick hair

(c) The feed on dry seeds and do not require drinking water

(d) They excrete very concentrated urine and do not use water to regulate body temperature

A. 3 and 1

B. 1 and 2

C. 3 and 4

D. 2 and 3

Answer: C



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27. Match the column I with column II and select the correct option

Column I

Column II

A. Camouflage

1. Dendrobates pumilio

B. Batesian mimicry

2. Horse-shoe bat

C. Warning colouration

3. Monarch butterfly

D. Echolocation

4. Praying mantis

A. A-2 , B-4 , C-3 , D-1

B. A-3, B-4 , C-2 , D-1

C. A-4 , B-1 , C-3 , D-2

D. A-4 , B-3 , C-1 , D-2

Answer: D



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28. Match the following with correct combination

Column I

A. Mutualism

B. Commensation

C. Parasitism

D. Predation

Column II

1. Tiger and Deer

2. Cuscuta and Cissus

3. Sucker fish and shark

4. Crab and sea anemone

A. A-1 , B-2 , C-3 , D-4

B. A-4 , B-3 , C-2 , D-1

C. A-1 , B-3 , C-2 , D-4

D. A-2 , B-3 , C-1 , D-4

Answer: B



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29. The change in population size at a given time interval t , is given by the expression

$$N_t = N_0 + B + I - D - E$$

I , B and D stand respectively for

- A. a rate of immigration, mortality rate, natality rate
- B. rate of emigration, natality rate, mortality rate
- C. mortality rate, rate of immigration, natality rate
- D. rate of immigration, natality rate, mortality rate

Answer: D

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30. The amount of fresh water of the earth frozen as polar or glacial ice is

A. 0.5%

B. 0.02%

C. 0.01%

D. 1.7%

Answer: D



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31. The eqn. $\frac{\Delta N_n}{\Delta N_t} = B$ represents which of the following ?

A. natality

B. growth rate

C. mortality

D. all of these

Answer: B



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32. In sigmoid growth curve, upper asymptote represents period of

- A. establishment
- B. positive acceleration
- C. negative acceleration
- D. equilibrium

Answer: D



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33. An association between two individuals or populations where both are benefitted and where neither can survive without the other is

- A. commensalism
- B. amensalism
- C. proto cooperation
- D. mutualism

Answer: D



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34. According to Allen's rule, mammals in cold regions have to conserve body heat.

- A. smaller extremities (legs, tails, and ears)
- B. longer extremities
- C. larger body mass
- D. smaller body mass

Answer: A

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35. Ornithophily refers to the pollination by which or the following :

A. insects

B. birds

C. snails

D. air

Answer: B

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36. Plant species having a wide range of genetical distribution evolve into a local population known as:

A. ecotype

B. biome

C. ecosystem

D. population

Answer: A



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37. Lime is added to the soil which is too:

A. sandy

B. saltry

C. alkaline

D. acidic

Answer: D



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38. The least porous soil among the following is a:

- A. loamy soil
- B. silty soil
- C. clayey soil
- D. peaty soil

Answer: C



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39. The greatest problem of water conservation is to reduce the amount of

- A. precipitation

- B. run off water
- C. ground water
- D. evaporatio

Answer: B

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40. Industrial melanism is an example of

- A. defensive adaptation of skin against UV radiations
- B. drug resistance
- C. protective resemblance with the surrounding
- D. darkening of skin due to industries.

Answer: C

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41. Niche of a species is

- A. position of species in a community in relation to other species
- B. place where organism lives
- C. place where organism lives and performs its duty
- D. place where population perform their duties

Answer: C

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42. If in a population, natality is balanced by mortality then there will be :

- A. decrease in population growth
- B. zero population growth

C. increase in population growth

D. over population

Answer: B



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43. _____ rule states that mammals from colder climates generally have shorter ears and limbs to minimise heat loss.

A. Niche rule

B. Allen's rule

C. Ehrlich rule

D. none of these

Answer: B



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44. Xerophytes are mostly

- A. succulents
- B. water related
- C. mesophytes
- D. none of these

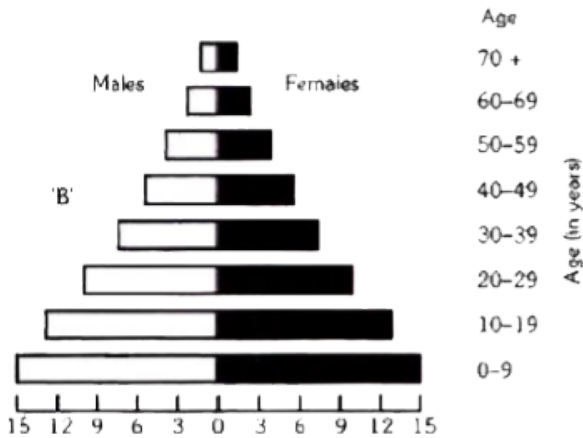
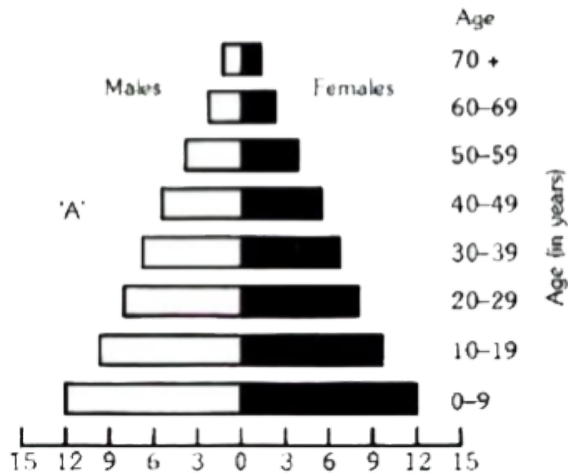
Answer: A



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45. A country with a high rate of population growth took measures to reduce it. The figure below shows agesex pyramids of populations A and B twenty years apart. Select the correct interpretation about

them:



A. 'A' is the earlier pyramid and no change has occurred in the growth rate.

B. 'B' is more recent and shows slight reduction in the growth rate.

C. 'B' is earlier pyramid and shows stabilized growth rate

D. 'B' is more recent showing that population is very young

Answer: B



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46. What would be the percent growth or birth rate per individual per hour for the same population mentioned in the previous question (Question 10)?

A. 100

B. 200

C. 50

D. 150

Answer: B



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47. A population has more young individuals compared to the older individuals. What would be the status of the population after some years ?

- A. It will decline
- B. It will stabilise
- C. It will increase
- D. It will first decline and then stabilise

Answer: C



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48. What parameters are used for tiger census in our country's national parks and sanctuaries ?

- A. Pug maks only
- B. Pug marks and faecal pellets
- C. Faecal pellets only
- D. Actual head counts

Answer: B



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49. Which of the following would necessarily decrease the density of a population in a given habitat ?

- A. Natality $>$ mortality
- B. Immigration $>$ emigration
- C. Mortality and emigration
- D. Natality and immigration

Answer: C

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50. A protozoan reproduces by binary fission. What will be the number of protozoans in its population after six generations ?

A. 128

B. 24

C. 64

D. 32

Answer: C

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51. In 2005, for each of the 14 million people present in a country, 0.028 were born and 0.008 died during the year. Using exponential equation, the number of people present in 2015 is predicted as

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52. Amensalism is an association between two species where

- A. one species is harmed and other is benefitted
- B. one species is harmed and other is unaffected
- C. one species is benefitted and other is unaffected
- D. both the species are harmed

Answer: B

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53. Lichens are the associations of

- A. bacteria and fungus
- B. algae and bacterium
- C. fungus and algae
- D. fungus and virus

Answer: C



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54. Which of the following is a partial root parasite ?

- A. Sandal wood
- B. Mistletoe
- C. Orobanche
- D. Ganoderma

Answer: A

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55. Which one of the following organisms reproduces sexually only once in its life time ?

- A. Banana plant
- B. Mango
- C. Tomato
- D. Eucalyptus

Answer: D

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56. Which one of the following is one of the characteristics of a biological community?

- A. sex-ratio
- B. Stratification
- C. Natality
- D. Mortality

Answer: B

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57. Which one of the following is most appropriately defined?

- A. Host is an organism which provides food to another organism
- B. Amensalism is a relationship in which one species is benefitted
the other is unaffected

C. Predator is an organism that catches and kills other organism for food

D. Parasire is an organism which always lives insides the body of other organism and may kill it .

Answer: C



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58. The species, though insignificant in number, determine the existence of many other species in a given ecosystem. Such species is known as:

- A. extinct species
- B. keystone species
- C. endemic species
- D. sacred species

Answer: B

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59. Population are said to be sympatric when

- A. two populations are isolated but occasionally come together to interbreed
- B. two populations share the same environment but come interbreed
- C. two populations live together and freely interbreed to produce-sterile offspring
- D. two populations are physically isolated by natural barriers

Answer: B

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60. Animals that rely on the heat from the environment , rather than of metabolism, to raise their body temperature are, in the strict sense, called

- A. ectothermic
- B. poikilothermic
- C. homeothermic
- D. endothermic

Answer: A

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61. A large regional unit characterised by vegetation type and associated fauna found in a specific climatic zone is called:

- A. ecosystem
- B. biological community
- C. biome
- D. habitat

Answer: C



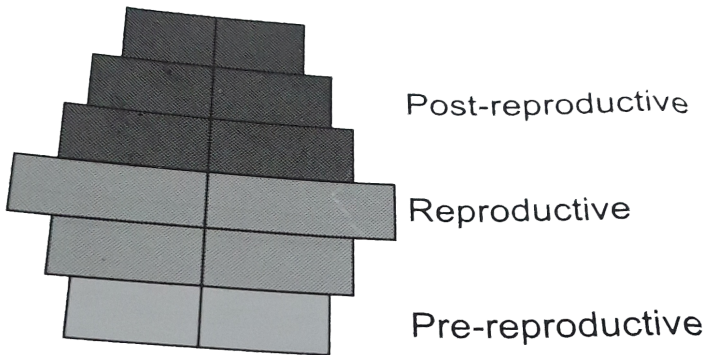
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62. Cold - blooded animals fall under the category of

- A. ectotherms
- B. psychotherms
- C. endotherms
- D. themophiles

Answer: A

63. What type of human population is represented by the following age pyramid?



- A. vanishing population
- B. stable population
- C. declining populations
- D. expanding population

Answer: C

64. Consider the following statements (a-d) each with one or two blanks:

(a) Bears go into (1) during winter to (2) cold weather.

(b) A conical age pyramid with a broad base represent (3) human population.

(c) A wasp pollinating a fig flower is an example of (4).

(d) An area with high levels of species richness is known as (5) .

Find the correct fill up words.

A. (3)-stable ,(4) commensalism ,(5) marsh

B. (1)-aestivation ,(2) -escape ,(3) stable ,(4) mutualism

C. 3-expanding ,(4)commensalism ,(5) diversity park

D. (1)- hibernation, (2) -escape (3) -expanding ,(5) hot spot

Answer: D



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65. The logistic population growth is expressed by the equation

A. $dt/dN = Nr \left(\frac{K - N}{K} \right)$

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

C. $dN/dt = rN$

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

Answer: B



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66. *Cuscuta* is an example of

A. ecotoparasitism

B. brood parasitism

C. predation

D. endoparasitism

Answer: A

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67. Animals that rely on the heat from the environment , rather than of metabolism, to raise their body temperature are, in the strict sense, called

A. ectothermic

B. poikilothermic

C. homeothermic

D. endothermic

Answer: A

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68. The carrying capacity of environment for a given population can be represented by the equation

A. $dN = rN - \frac{N}{K}$

B. $\frac{dN}{dt} = rN - \frac{N}{K}$

C. $\frac{dN}{dt} = rN - \frac{1}{K}$

D. $\frac{dN}{dt} = rN \left(1 - \frac{N}{K} \right)$

Answer: D

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69. Animals that can tolerate a narrow range of salinity are

A. eucyhaline

B. stenohaline

C. neither (a) nor (b)

D. saline

Answer: B



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70. The tendency of population to remain in genetic equilibrium may be disturbed by

A. lack of migration

B. lack of mutations

C. lack of random mating

D. random mating

Answer: C

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71. A sedentary sea anemone gets attached to the shell lining of hermit crab. The association is

- A. symbiosis
- B. commensalism
- C. ammensalism
- D. ectoparasitism

Answer: A

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72. The plants which can withstand with narrow and broad range of temperature tolerance respectively are

A. monothermal and stenothermal

B. stenothermal and monothermal

C. stenothermal and eurythermal

D. stenothermal and mesothermal

Answer: C



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73. Desert can be converted into green land by planting

A. terrestrial plant

B. xerophytic plant

C. halophytes

D. psammophytes

Answer: D



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74. In an area, a population with large size individuals having long life span, more parental care and slow development was present.

The type of population growth curve will be

- A. S-shaped
- B. J-shaped
- C. Z-shaped
- D. All of these

Answer: A



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75. An association of individuals of different species living in the same habitat and having functional interactions is :

- A. Population
- B. Ecological niche
- C. Biotic community
- D. Ecosystem

Answer: C



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76. In which of the following interaction both partners are adversely affected ?

- A. Mutualism
- B. Competition
- C. Predation
- D. Parasitism

Answer: B

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77. Gause's principle of competitive exclusion states that:

- A. Competition for the same resources excludes species having different food preferences
- B. No two species can occupy the same niche indefinitely for the same limiting resources
- C. Larger organisms exclude smaller ones through competition
- D. More abundant species will exclude the less abundant species through competition

Answer: B

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78. When does the growth rate of a population following the logistic model equal zero ? The logistic model is given as $dN/dt = rN(1-N/K)$:

- A. When N nears the carrying capacity of the habitat
- B. When N/K equals zero
- C. When death rate is greater than birth rate.
- D. When N/K is exactly one

Answer: D



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79. Which of the following is correct for r-selected species ?

- A. Large number of progeny with small size
- B. Large number of progeny with large size

C. Small number of progeny with small size

D. Small number of progeny with large size

Answer: A



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80. If '+' sign is assigned to benefited interaction '-' sign to detrimental and '0' sign to neutral interaction, then the population interaction represented by '+-' refers to:

A. mutualism

B. amensalism

C. commensalism

D. parasitism

Answer: D

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81. Competitive exclusion principle was given by

- A. C. Darwin
- B. G. F. Gause
- C. G. F. Gause
- D. Verhulst & Pearl

Answer: B

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82. Asymptote in a logistic growth curve is obtained, when

- A. $K=N$
- B. $K > N$

C. $K < N$

D. the value of 'r' approaches zero

Answer: A



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83. Plants, which produce characteristic pneumatophores and show vivipary belong to

A. halophytes

B. psammophytes

C. hydrophytes

D. mesophytes

Answer: A



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84. In a growing population of a country ,

A. pre-reproductive individuals are more than the reproductive individuals

B. reproductive individual are less than the post reproductive individuals

C. reproductive and pre-reproductive individuals are equal in number

D. pre-reproductive individual are less than the reproductive individuals

Answer: A

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85. Which one fo the following population interactions is widely used in medical science for the production of antibiotics?

- A. Commensalism
- B. Mutualism
- C. Parasitism
- D. Amensalism

Answer: D

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86. Niche is

- A. all the biological factors in the organism's environment
- B. the physical space where an organism lives
- C. the range of temperature that the organism needs to live

D. the functional role played by the organism where it lives

Answer: D



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87. Natality refers to

A. death rate

B. birth rate

C. number of individuals leaving the habitat

D. number of individuals entering a habitat.

Answer: B



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1. Assertion : Lizards storm toward light at night .

Reason : Lizards do not like darkness .

A. If both A and R are true and R is the correct explanation of A .

B. If both A and R are true but R is not the correct explanation of

A .

C. If A is true but R is false .

D. If both A and R are are false .

Answer: C



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2. Assertion : Aquatic plants contain aerenchyma.

Reason : Aerenchyma keeps aquatic plants afloat .

- A. If both A and R are true and R is the correct explanation of A .
- B. If both A and R are true but R is not the correct explanation of A .
- C. If A is true but R is false .
- D. If both A and R are are false .

Answer: A



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3. Assertion : Chamaeleon can change its colour .

Reason : It is a fashionable animal .

- A. If both A and R are true and R is the correct explanation of A .
- B. If both A and R are true but R is not the correct explanation of A .
- A .

C. If A is true but R is false .

D. If both A and R are are false .

Answer: C



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4. Assertion (A) : Animals adopt different strategies to survive in hostile environment.

Reason (R) : Praying mantis is green in colour which merges with plant foliage.

A. If both A and R are true and R is the correct explanation of A .

B. If both A and R are true but R is not the correct explanation of A .

C. If A is true but R is false .

D. If both A and R are are false .

Answer: B

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5. Assertion : Viceroy butterfly mimics Monarch butterfly .

Reason : Monarch butterfly is toxic and unpalatable .

- A. If both A and R are true and R is the correct explanation of A .
- B. If both A and R are true but R is not the correct explanation of A .
- C. If A is true but R is false .
- D. If both A and R are are false .

Answer: A

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6. Assertion : Proline and chaperonins are widespread in plants of cold regions .

Reason : Proline and chaperonins prevent freezing .

- A. If both A and R are true and R is the correct explanation of A .
- B. If both A and R are true but R is not the correct explanation of A .
- C. If A is true but R is false .
- D. If both A and R are are false .

Answer: D



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7. Assertion : Many hydrophytes lack roots .

Reason : Roots are used for balancing .

- A. If both A and R are true and R is the correct explanation of A .

B. If both A and R are true but R is not the correct explanation of

A .

C. If A is true but R is false .

D. If both A and R are are false .

Answer: B



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8. Assertion : Cold blooded animals do not have fat layer.

Reason : Cold blooded animals use their fat for metabolic process during hibernation

A. If both A and R are true and R is the correct explanation of A .

B. If both A and R are true but R is not the correct explanation of

A .

C. If A is true but R is false .

D. If both A and R are are false .

Answer: A

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9. (A) : A biotic community comprises several interdependent species.

(R) : A biotic community is always dependent on either plants or animals.

A. If both A and R are true and R is the correct explanation of A .

B. If both A and R are true but R is not the correct explanation of A .

C. If A is true but R is false .

D. If both A and R are are false .

Answer: A

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10. Assertion : Scavenging improves the environment .

Reason : A scavenger disposes of dead organic matter .

- A. If both A and R are true and R is the correct explanation of A .
- B. If both A and R are true but R is not the correct explanation of A .
- C. If A is true but R is false .
- D. If both A and R are are false .

Answer: A

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11. Assertion : Pathogenic bacteric do not multiply well in the soil .

Reason : Antibiotic - producing fungi and bacteria are common in the soil.

- A. If both A and R are true and R is the correct explanation of A .
- B. If both A and R are true but R is not the correct explanation of A .
- C. If A is true but R is false .
- D. If both A and R are are false .

Answer: A



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12. Assertion : Parasites produce fewer young ones .

Reason : They have an easy life in their hosts .

- A. If both A and R are true and R is the correct explanation of A .

B. If both A and R are true but R is not the correct explanation of

A .

C. If A is true but R is false .

D. If both A and R are are false .

Answer: D

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13. Assertion : Leguminous plants can grow well in N_2 - deficient soils

.

Reason : They need little nitrogen .

A. If both A and R are true and R is the correct explanation of A .

B. If both A and R are true but R is not the correct explanation of

A .

C. If A is true but R is false .

D. If both A and R are are false .

Answer: C

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14. Assertion : Biological control of pests is advantageous.

Reason : It does not cause pollution .

- A. If both A and R are true and R is the correct explanation of A .
- B. If both A and R are true but R is not the correct explanation of A .
- C. If A is true but R is false .
- D. If both A and R are are false .

Answer: A

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15. Assertion : Consumers are not essential for a biotic community .

Reason : Producers and reducers can maintain a biotic community .

- A. If both A and R are true and R is the correct explanation of A .
- B. If both A and R are true but R is not the correct explanation of A .
- C. If A is true but R is false .
- D. If both A and R are are false .

Answer: B

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16. Assertion : Allelopathy is a form of ammensalism that occurs in plants .

Reason : Association of rooting plants with fungal hyphae is an important example ammensalism .

- A. If both A and R are true and R is the correct explanation of A .
- B. If both A and R are true but R is not the correct explanation of A .
- C. If A is true but R is false .
- D. If both A and R are are false .

Answer: C

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17. Assertion : In open water zone upto the depth to which light can penetrate , called photic zone .

Reason : The photic zone is categorised into euphotic and disphotic zone .

- A. If both A and R are true and R is the correct explanation of A .
- B. If both A and R are true but R is not the correct explanation of A .
- C. If A is true but R is false .
- D. If both A and R are are false .

Answer: B

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18. Assertion : Geneecology is the study of genetic composition and changes in relation to the origin of ecades , ecotypes , new sps. , etc .

Reason: Autecology deals with the study of a group of organisms .

- A. If both A and R are true and R is the correct explanation of A .
- B. If both A and R are true but R is not the correct explanation of A .
- A .

C. If A is true but R is false .

D. If both A and R are are false .

Answer: C



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