

Population Ecology Fundamentals

Biology · Answer Key · 34 Questions

1. What is population ecology the study of?

- A) Populations in relation to their environment and social interactions.**
- B) The physical environment of an ecosystem.
- C) The evolution of species over time.
- D) The distribution of different species in a habitat.

2. Which of the following is NOT listed as a study area within population ecology?

- A) Population size
- B) Interactions in the environment
- C) Social organisation & Succession
- D) Geological formations.**

3. What defines a population in ecological terms?

- A) A group of different species that occupy the same habitat.
- B) A group of the same species that occupies the same habitat at the same time and are able to interbreed.**
- C) Any group of organisms living together.
- D) Individuals of the same species that can survive in different habitats.

4. Which factors affect population size?

- A) Natality, mortality, and migration.**
- B) Predation, competition, and symbiosis.
- C) Carrying capacity and environmental resistance.
- D) Birth rate, death rate, and immigration.

5. What is natality in the context of population ecology?

- A) The movement of individuals out of a population.
- B) The death rate within a population.
- C) The birth rate within a population.**
- D) The rate of species evolution.

6. What is mortality in the context of population ecology?

- A) The birth rate within a population.
- B) The movement of individuals into a population.
- C) The death rate within a population.**
- D) The rate of population growth.

7. Immigration is defined as:

- A) Individuals leaving a population.
- B) The birth rate of a population.
- C) Movement into a population.**
- D) The death rate of a population.

8. Emigration is defined as:

- A) Movement into a population.
- B) Individuals leaving a population.**
- C) The birth rate of a population.
- D) The death rate of a population.

9. Which formula represents population change?

- A) $(\text{Deaths} + \text{Emigration}) - (\text{Births} + \text{Immigration})$
- B) $(\text{Number of births} + \text{Immigration}) - (\text{Deaths} + \text{Emigration})$**
- C) $(\text{Number of births} + \text{Deaths}) - (\text{Immigration} + \text{Emigration})$
- D) $(\text{Immigration} + \text{Emigration}) - (\text{Births} + \text{Deaths})$

10. Direct techniques for determining population size:

- A) Estimate population size where it is difficult to determine the actual number.
- B) Determine the actual population sizes.**
- C) Are used for smaller or fast-moving organisms.
- D) Involve mark and recapture methods.

11. Which direct technique involves taking an aerial photo to count individuals?

- A) Census
- B) Mark and recapture
- C) Aerial photography**
- D) Quadrat method

12. A census is a direct method primarily used for determining the actual number of:

- A) Animals in a forest.
- B) Humans in an area or country.**
- C) Insects in a field.
- D) Plants in a garden.

13. Indirect counting techniques are used when:

- A) The population size is very large and easily visible.
- B) It is difficult to determine the actual number of organisms.**
- C) The organisms are slow-moving.
- D) Aerial photography is available.

14. The Mark and Recapture method is an example of:

- A) A direct counting technique.
- B) An indirect counting technique.**
- C) A method for determining species diversity.
- D) A way to measure environmental resistance.

15. In the Mark and Recapture formula ($N=MC/R$), what does 'N' represent?

- A) The number of marked individuals in the second sample.
- B) The total number of individuals estimated in the given population.**
- C) The number of individuals captured and marked in the first sample.
- D) The number of individuals captured in the second sample.

16. What is a 'species' defined as in the text?

- A) A group of organisms that share the same habitat.
- B) A group of organisms capable of interbreeding, producing fertile offspring.**
- C) A population that is endangered.
- D) All living factors in an ecosystem.

17. What is an 'ecosystem'?

- A) A biological community of interacting organisms and their physical environment.**
- B) The specific area where an organism inhabits.
- C) The sum of all biotic and abiotic factors in an ecosystem.
- D) The environment in which an organism completes its lifecycle.

18. Abiotic factors are:

- A) Living factors of an ecosystem.
- B) Non-living factors in an ecosystem.**
- C) The interactions between species.
- D) The total number of individuals in a population.

19. Biotic factors are:

- A) Non-living factors in an ecosystem.
- B) Living factors of an ecosystem.**
- C) The physical environment of an ecosystem.
- D) The carrying capacity of an environment.

20. What is 'environmental resistance'?

- A) The rate at which a population grows.
- B) All factors that are limiting the biotic potential and numerical increase of a population.**
- C) The number of individuals an ecosystem can support.
- D) The process of species becoming extinct.

21. Carrying capacity is defined as:

- A) The total number of species in an ecosystem.
- B) The number of individuals that leave a population.
- C) The largest number of individuals in a biological species that an ecosystem can support over an indefinite time.**
- D) The rate of immigration into a population.

22. A stable population is one with:

- A) A rapidly growing size.
- B) A zero growth rate, neither growing nor shrinking in size.**
- C) A declining population size.
- D) A size that constantly exceeds the carrying capacity.

23. Density-dependent factors have a direct correlation to:

- A) Natural disasters.
- B) The size of the population in an area.**
- C) The abiotic factors of an environment.
- D) The genetic diversity of a species.

24. Density-independent factors exert influence on a population:

- A) Only when the population is large.
- B) Regardless of its size.**
- C) Only during specific seasons.
- D) Based on the carrying capacity.

25. What is a 'closed population'?

- A) A population with high immigration and emigration.
- B) A population where only natality and mortality influence its size.**
- C) A population that has reached its carrying capacity.
- D) A population with a declining birth rate.

26. Geometric growth is characteristic of:

- A) Mammals.
- B) Higher-order organisms.
- C) Micro-organisms like bacteria and protists.**
- D) Large, slow-moving animals.

27. The lag phase in geometric growth occurs because:

- A) The birth rate is higher than the death rate.
- B) Resources become limited.
- C) Individuals may be acclimatizing, finding mates, or are sexually immature.**
- D) The population is rapidly decreasing.

28. Logistic growth is also known as:

- A) J-shaped growth curve.
- B) Geometric growth curve.
- C) S-shaped growth curve.**
- D) Exponential growth curve.

29. Which phase of logistic growth occurs when the carrying capacity of the environment has been reached?

- A) Lag phase
- B) Exponential growth phase
- C) Decelerating growth phase
- D) Equilibrium/stationary phase**

30. Predation is defined as:

- A) Competition between individuals of the same species.
- B) A close physical association between two different organisms.
- C) The act of preying on another animal.**
- D) The process whereby one species out-competes another.

31. Interspecific competition occurs between:

- A) Members of the same species.
- B) Different species.**
- C) Predators and prey.
- D) Parasites and hosts.

32. Intraspecific competition occurs between:

- A) Different species.
- B) Predators and prey.
- C) Members of the same species.**
- D) Symbiotic partners.

33. What is mutualism?

- A) A symbiotic relationship where one organism benefits and the other is harmed.
- B) A symbiotic relationship where one organism benefits without harming the other.
- C) A symbiotic relationship where both species benefit.**
- D) Competition between different species.

34. Commensalism is a symbiotic relationship where:

- A) One species benefits, and the other is harmed.
- B) Both species benefit.
- C) One species benefits, and the other is neither harmed nor benefits.**
- D) Individuals of the same species compete.