ALBERTA BIOLOGY 30 · UNIT D · 25 QUESTIONS

Population & Community Dynamics — Practice Test

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

1 **Which of the following is a density-dependent factor that could limit the growth of a population of nesting birds?**

- **A** A flood that destroys nests along a riverbank
- **B** A drought that reduces the growth of seed-producing plants
- **C** Competition for nesting sites that increases as the population grows
- **D** A late frost that kills insects eaten by the birds

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2 **The graph shows population size over time for rabbits introduced to an island with abundant food and no predators. What is the population size after 3 years?**

A 40

B 80

C 160

D 20

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3 **After a glacier retreats, lichens are the first organisms to grow on the newly exposed rock. In ecological succession, the lichens are described as**

A pioneer species

B climax species

C seral species

D keystone species

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4 **In a population that is in Hardy-Weinberg equilibrium, the frequency of the dominant allele is 0.7. The frequency of the homozygous dominant genotype is**

- A 0.09
- B 0.42
- C 0.70
- D 0.49

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5 **A clownfish lives among the stinging tentacles of a sea anemone. The clownfish is protected from predators, and the anemone receives nutrients from waste produced by the clownfish. This relationship is an example of**

- A mutualism
- B parasitism
- C commensalism
- D competition

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6 **In one year, a population of 2000 deer had 300 births, 150 deaths, 50 immigrants, and 100 emigrants. The per capita growth rate of the deer population for that year was**

A 0.025

B 0.075

C 0.05

D 0.10

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7 **The graph shows a yeast population in a flask with a limited supply of nutrients. What is the carrying capacity of the flask shown by the graph?**

A 300

B 500

C 700

D 650

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8 **Which of the following sets of characteristics best describes an r-selected species?**

A long lifespan, few offspring, and extensive parental care

B late sexual maturity and a low reproductive rate

C large body size and a population maintained near carrying capacity

D short lifespan, many offspring, and little or no parental care

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9 **Two populations of the same wildflower species grow on opposite banks of a river. Bees carry pollen between the two populations. Over time, this movement of pollen will most likely**

A increase gene flow and decrease the genetic differences between the populations

B cause a founder effect in both populations

C cause a population bottleneck in both populations

D increase genetic drift and increase the genetic differences between the populations

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10 **A wildfire burns a mature spruce forest, but the soil remains intact. Grasses, shrubs, and eventually spruce trees regrow in the area. This regrowth is an example of**

A primary succession

B a climax community

C secondary succession

D competitive exclusion

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11 **The graph shows the number of survivors at each age for a cohort. How many survivors are there at age 2? Record your answer as a number.**

ANSWER _____

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12 **During a storm, a small flock of finches is blown from the mainland to an isolated island, where the finches establish a new population. The allele frequencies of the island population differ noticeably from those of the mainland population. This difference is best explained by**

A gene flow between the two populations

B genetic drift, as a result of the founder effect

C natural selection caused by predators on the island

D an increased mutation rate on the island

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13 **In a population that is in Hardy-Weinberg equilibrium, the frequency of the homozygous recessive genotype is 0.04. The frequency of heterozygous carriers in the population, expressed as a value between 0 and 1, is**

ANSWER _____

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14 **A disease outbreak kills 90% of the individuals in a population of wild cats. Compared with the original population, the surviving population will most likely have**

A less genetic diversity and greater vulnerability to environmental change

B more genetic diversity and greater resistance to disease

C the same allele frequencies as the original population

D a higher rate of mutation in its genes

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15 **Two species of warblers feed on insects in the same spruce trees. One species feeds near the top of each tree, and the other species feeds near the trunk. By feeding in different locations, the two species**

A increase interspecific competition

B demonstrate competitive exclusion

C form a mutualistic relationship

D reduce competition through resource partitioning

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16 **Over one year, a population of 800 caribou had 96 births, 40 deaths, 24 immigrants, and 16 emigrants. The per capita growth rate of the population for that year was**

ANSWER

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17 **Oxpecker birds feed on ticks and other parasites found on the skin of zebras. Ticks feed on the blood of zebras. Which of the following rows identifies the relationship between the oxpecker and the zebra and the relationship between the tick and the zebra?**

A Oxpecker and zebra: parasitism Tick and zebra: mutualism

B Oxpecker and zebra: commensalism Tick and zebra: parasitism

C Oxpecker and zebra: mutualism Tick and zebra: parasitism

D Oxpecker and zebra: mutualism Tick and zebra: commensalism

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18 **To estimate the size of a grouse population, biologists captured and marked 80 grouse and then released them. Later, the biologists captured 100 grouse, and 20 of the captured grouse were marked. The estimated size of the grouse population is**

ANSWER

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19 **The graph shows heterozygous genotype frequency for different recessive allele frequencies in a population in Hardy-Weinberg equilibrium. Point A marks a recessive allele frequency of 0.6. What is the heterozygous genotype frequency at point A, expressed as a value between 0 and 1? Record your answer as a number.**

ANSWER

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20 **Northern pike were introduced into a lake that contains a population of native minnows. After the introduction, the minnow population begins to decline. The arrival of the pike in the lake is an example of**

- **A** immigration, and it increases the mortality of the minnows
- **B** immigration, and it decreases the mortality of the minnows
- **C** emigration, and it increases the mortality of the minnows
- **D** emigration, and it decreases the mortality of the minnows

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21 **Which of the following sequences correctly describes the stages of primary succession on bare rock exposed by a retreating glacier?**

- **A** grasses → shrubs → lichens → trees
- **B** trees → shrubs → grasses → mosses
- **C** mosses → lichens → grasses → trees
- **D** lichens → mosses → grasses → shrubs → trees

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22 **A closed population of 1200 elk has a per capita growth rate of -0.05 per year. The size of the elk population after one year is**

ANSWER

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23 **An unusually severe winter kills a large proportion of a deer population. The proportion of deer killed is similar in a small, isolated part of the population and in a large, dense part of the population. The severe winter is best described as**

A a density-dependent limiting factor

B an increase in the biotic potential of the population

C a density-independent limiting factor

D a decrease in the carrying capacity of the environment

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24 **Peppered moths rest on tree trunks. In a forest where the tree bark has been darkened by soot, birds eat more light-coloured moths than dark-coloured moths. Over many generations, the frequency of the allele for dark colour increases in the moth population. This change in the gene pool is caused by**

- A genetic drift
- B natural selection
- C the founder effect
- D gene flow

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25 **A population will remain in Hardy-Weinberg equilibrium only if**

- A the population is very small
- B mutations occur at a high rate
- C individuals move into and out of the population
- D mating is random and no natural selection occurs

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ANSWER KEY

1. C
2. B
3. A
4. D
5. A
6. C
7. C
8. D
9. A
10. C
11. 500
12. B
13. 0.32
14. A
15. D
16. 0.08
17. C
18. 400
19. 0.48
20. A
21. D
22. 1140
23. C
24. B
25. D

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