CALIFORNIA BIOLOGY · UNIT 4 · 25 QUESTIONS

Biological Evolution: Unity and Diversity — 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 **Natural selection acts on**

- **A** Individuals changing during their lifetime
- **B** Variation in a population, favouring traits that improve survival and reproduction
- **C** Mutations after they are needed
- **D** Genotypes only in isolation

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2 **An adaptation is a trait that**

A Improves survival or reproduction in an environment

B An organism learns in its lifetime

C Appears only after extinction

D Is always visible

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3 **The fossil record provides evidence for evolution because fossils show**

A Only living species

B Organisms changing over time in rock layers

C Identical species in every layer

D No extinct species

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4 **Homologous structures, such as the forelimbs of humans, bats, and whales, provide evidence for**

- A Unrelated origins
- B No evolution
- C Common ancestry
- D Convergent evolution only

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5 **Analogous structures, such as bird wings and insect wings, are similar in function but not from a common structure, and are evidence for**

- A Common ancestry
- B Genetic drift
- C Convergent evolution
- D Homology

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6 **Similarities in early embryos of different vertebrates suggest**

A They eat the same food

B They are unrelated

C They live in the same habitat

D Common ancestry

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7 **Molecular evidence for evolution includes comparing**

A Habitat temperature

B Only fossil sizes

C DNA and protein sequences between species

D Only body size

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8 **A species is most commonly defined as a group of organisms that can**

A Interbreed and produce fertile offspring

B Look alike

C Live in the same place

D Eat the same food

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9 **Geographic isolation can lead to speciation because separated populations**

A Become identical

B Stop reproducing

C Experience different selection and accumulate genetic differences

D Stop mutating

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10 **A bottleneck effect occurs when a population is greatly reduced in size, which can**

- **A** Create new species instantly
- **B** Increase genetic diversity
- **C** Stop natural selection
- **D** Reduce genetic diversity by chance

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11 **The founder effect occurs when a small group starts a new population, so the new population may have**

- **A** The full diversity of the original
- **B** No variation
- **C** No mutations
- **D** Allele frequencies different from the original by chance

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12 **Antibiotic resistance in bacteria spreads mainly because antibiotics**

A Change bacterial DNA directly in every cell

B Kill susceptible bacteria, leaving resistant ones to reproduce

C Cause mutations on demand

D Make bacteria stronger individually

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13 **In the Hardy Weinberg model, p plus q equals**

A 0.5

B 2

C 1

D 0

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14 **In a population in Hardy Weinberg equilibrium with p = 0.6 and q = 0.4 , the expected frequency of heterozygotes , 2pq , is**

ANSWER

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15 **In a population in Hardy Weinberg equilibrium with p = 0.7 , the expected frequency of the homozygous dominant genotype , p^2 , is**

ANSWER

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16 **If the frequency of a recessive allele q is 0.2, the frequency of the dominant allele p is**

ANSWER

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17 **A cladogram groups organisms by**

- A Age only
- B Shared derived characteristics
- C Size only
- D Habitat only

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18 **The most recent common ancestor of two species on a cladogram is found at the**

- A Tip of a branch
- B Root only
- C Node where their branches join
- D Longest branch

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19 **An individual organism does not evolve during its lifetime, but a population evolves when**

A Allele frequencies change over generations

B One animal learns a skill

C An animal migrates

D The climate changes once

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20 **Artificial selection differs from natural selection because in artificial selection humans**

A Prevent all variation

B Do not affect reproduction

C Cause mutations

D Choose which organisms reproduce

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21 **Vestigial structures, such as the human appendix or whale hip bones, are evidence for evolution because they are**

A Reduced structures inherited from ancestors

B New structures

C Fully functional in the same way

D Proof of no ancestry

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22 **Extinction occurs when**

A A species changes colour

B The last member of a species dies and no members remain

C A species moves

D A population grows

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23 **Gene flow between populations tends to**

- A Reduce differences between them
- B Increase differences between them
- C Cause extinction
- D Stop evolution

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24 **A mutation is the ultimate source of new genetic variation because it creates**

- A New habitats
- B New alleles
- C New species instantly
- D New fossils

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25

In a population of 1000 individuals , 360 show a recessive trait The frequency q^2 is 0.36 , so q is

ANSWER

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ANSWER KEY

1. B
2. A
3. B
4. C
5. C
6. D
7. C
8. A
9. C
10. D
11. D
12. B
13. C
14. 0.48
15. 0.49
16. 0.8
17. B
18. C
19. A
20. D
21. A
22. B
23. A
24. B
25. 0.6

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