

***Ecology Evolution Application Integration 2nd
edition Krohne Test Bank***

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Chapter 2 Adaptation and Evolution

Multiple Choice

1. Darwin was interested in marine iguanas because
- a. they provided food for the expedition.
 - b. their behavior interested him.
 - c. they differed from land iguanas.
 - d. a and b
 - A. b and c

Answer: e

2. An adaptation is a feature of the organism that
- a. increases its population size.
 - b. increases its fitness.
 - c. affects other organisms.
 - d. does not include behavior.
 - e. does not include morphology.

Answer: b

3. Which of the following influenced Darwin's thinking about evolution?
- a. the theory of uniformitarianism
 - b. the geology of volcanoes
 - c. geographic variation in species
 - d. all of the above
 - e. none of the above

Answer: d

4. Which of the following was not a component of Darwin's logical argument about natural selection?
- a. There is variation among individuals in a population.
 - b. Few organisms achieve their reproductive potential.
 - c. There is competition among individuals.
 - d. New species arise primarily on islands.
 - e. none of the above

Answer: d

5. The gene pool is characterized by
- a. allele frequencies.
 - b. mutations.
 - c. its DNA sequences.
 - d. Mendel's laws.
 - e. none of the above

Answer: a

6. For a population of 100 individuals in which 60 are homozygous dominant (AA), 20 are heterozygous (Aa), and 20 are homozygous recessive (aa), the value of p is
- 0.6.
 - 0.2.
 - 0.7.
 - 0.5.
 - 1.0.

Answer: c

7. Which of the following is *not* an assumption of the Hardy-Weinberg model?
- Mating is random.
 - no differential success of genotypes
 - no competition among individuals
 - no net movement of alleles
 - no new mutations

Answer: c

8. What is the significance of a population that is in Hardy-Weinberg equilibrium?
- It is not evolving.
 - Selection and gene flow are in equilibrium.
 - Each genotype occurs in equal frequency.
 - The values of p and q are equal.
 - none of the above

Answer: a

9. Resistance to pesticides
- is an example of gene flow.
 - arises by genetic drift.
 - is the result of long-term changes in the pesticide.
 - is independent of the selection coefficient.
 - none of the above

Answer: e

10. Genetic drift
- always opposes natural selection.
 - is more significant in small populations.
 - is the result of gene flow.
 - depends on the fitness of the alleles.
 - none of the above

Answer: b

11. In disruptive selection,
- one tail of the distribution is favored.
 - both tails of the distribution are favored.
 - the center of the distribution is favored.
 - the tails and center of the distribution are favored.

- e. none of the above

Answer: b

12. Fitness is

- a. a property of the population.
- b. a property of the species.
- c. a property of the individual.
- d. independent of the environment.
- e. none of the above

Answer: c

13. The significance of the Hardy-Weinberg equilibrium is that

- a. it demonstrates that evolution eventually stops.
- b. it demonstrates that natural selection is the only mechanism of evolution.
- c. it demonstrates that evolution only happens in large populations.
- d. its assumptions lead to mechanisms of evolution.
- e. none of the above

Answer: d

14. Phenotypic plasticity

- a. is unimportant to evolution.
- b. is the direct result of the environment on the phenotype.
- c. is the direct result of the genotype on the phenotype.
- d. occurs in traits with high heritability.
- e. none of the above

Answer: b

15. Darwin's theory

- a. resulted from his understanding of genetics.
- b. states that all features of organisms are adaptive.
- c. did not include genetic drift as a mechanism.
- d. was immediately accepted.
- e. none of the above

Answer: c

16. An organism's phenotype

- a. is determined only by its genotype.
- b. is independent of its genotype.
- c. is an example of mutation.
- d. does not evolve.
- e. none of the above

Answer: e

True/False

1. Directional selection eliminates the average individuals.

Answer: False

2. Heritability and the selection coefficient determine the rate of evolution.

Answer: True

3. Mutation pressure changes the effective population size

Answer: False

4. Ecotypes are the result of phenotypic plasticity.

Answer: False

5. Darwin's theory of evolution was correct but incomplete.

Answer: True

Fill in the Blank/Short Answer

1. Genetic drift is more pronounced when _____ is small; natural selection is more pronounced when _____ is large.

Answer: N_e ; selection coefficient and/or heritability

2. The panda's "thumb" is an example of _____.

Answer: an imperfect adaptation

3. The _____ states that for some species the environment changes faster than adaptations can arise.

Answer: Red Queen Hypothesis

4. In Wright's adaptive landscape, the vertical (y) axis depicts the _____ of the genotype.

Answer: fitness

5. The sum of all alleles in a population constitutes the _____.

Answer: gene pool

6. _____ is one factor that decreases the value of N_e .

Answer: Skewed sex ratio

7. If the value of $p = 1.0$ we say that the allele is _____.

Answer: fixed

8. If the value of $q = 0.78$, the value of p is _____.

Answer: 0.22

9. Ecotypes are most likely to arise if _____ and _____.

Answer: natural selection is intense; the environment changes abruptly

10. In a population in H-W equilibrium in which $p = 0.4$ and $q = 0.6$, the frequency of the heterozygotes is _____.

Answer: 0.48

11. If there are just two alleles at a locus, $p + q$ must equal _____.

Answer: 1.0

12. How was Darwin's theory of evolution incomplete?

Answer: Darwin did not have a correct theory of inheritance. He did not recognize that evolution can occur by processes other than natural selection such as genetic drift and gene flow.