

Create 15 comprehension questions from Campbell Biology 12th edition, chapter 20. Include the answers.

1. What is the concept of natural selection?

Answer: Natural selection is the process by which certain heritable traits become more or less common in a population due to the effects of differential reproduction and survival.

2. What is gene flow?

Answer: Gene flow is the movement of alleles among populations as a result of interbreeding or immigration.

3. What is the principle of competitive exclusion?

Answer: The competitive exclusion principle states that two species competing for the same resources cannot coexist in the same habitat.

4. What is the relevant timescale for microevolution?

Answer: The relevant timescale for microevolution is the lifetime of a species, which can be as short as about 100 years for a rapidly evolving organism or as long as many millions of years for a more slowly evolving species.

5. What are stabilizing and directional selection?

Answer: Stabilizing selection acts to reduce the degree of variation within a population by reducing the extreme phenotypes and favoring intermediate forms. Directional selection is a strong force toward a certain phenotype, usually the extreme phenotype that maximizes the chance of survival and reproduction.

6. What is diversifying selection?

Answer: Diversifying selection increases variation in a population by favoring different types of phenotypes and creating a wider range of variation.

7. What are mutations?

Answer: Mutations are changes in the DNA sequence that can cause changes in the gene product and phenotype.

8. What is local adaptation?

Answer: Local adaptation is the process in which populations become adapted to the environment of their own geographic location by the process of natural selection.

9. What is gene drift?

Answer: Gene drift is a cause of genetic variation in which the frequency of an allele in a population changes due to chance events such as genetic drift, mutation and migration.

10. What are genetic bottlenecks?

Answer: Genetic bottlenecks occur when a population experiences a drastic reduction in size and variability due to external events.

11. What is a founder effect?

Answer: A founder effect occurs when a small number of individuals establish a new population, introducing a unique set of alleles that may not be representative of the original population.

12. What is a speciation event?

Answer: A speciation event is an event in which a new species is created through the process of gene flow and selection.

13. What is genetic isolation?

Answer: Genetic isolation is a process by which two populations of a species are prevented from interbreeding due to physical or geographical factors.

14. What is the allopatric model of speciation?

Answer: The allopatric model of speciation proposes that when two populations of a species are geographically separated, they will no longer be able to interbreed, leading to the formation of two distinct species.

15. What is a reproductive barrier?

Answer: A reproductive barrier is any physical or biological feature that prevents two populations of the same species from interbreeding.