

1) Which of the following statements about evolution is FALSE?

- A) Evolution involves a change of frequency of alleles in the gene pool.
- B) Populations evolve.
- C) Individuals evolve.
- D) Evolution can proceed to a limited extent without the occurrence of mutation.
- E) An entire species can evolve.

2) Organisms that can interbreed with each other in nature but which are genetically isolated from all other organisms are

- A) genus.
- B) clone.
- C) species.
- D) family.
- E) population.

3) Two European men and two Polynesian women settled on a previously uninhabited tropical island. All four of the settlers have brown eyes but one of the Europeans is heterozygous and carries the recessive gene for blue eyes. No new settlers arrive and nobody leaves the island. After a few generations, the percentage of blue eyed individuals increases from the original zero to 25%. This is probably due to which of the following factors?

- A) genetic drift
- B) Natural selection
- C) mutation
- D) gene flow
- E) nonrandom mating

4) Imagine a population of monkeys in South America whose habitat has been reduced to the point where only 25 monkeys survive. This is an example of

- A) population bottleneck.
- B) founder effect.
- C) genetic drift.
- D) natural selection.
- E) all of the above

5) Genetic drift results in a change in gene frequencies because

- A) the population size is so small that chance occurrences can alter gene frequencies.
- B) reproduction is non-random within the population.
- C) gene flow within the population is less than gene flow between populations.
- D) the population has not yet stabilized.
- E) the population is so large that natural selection has little noticeable effect.

6) Mutations

- A) are always detrimental.
- B) occur to solve problems for species (are goal oriented).
- C) are random.

- D) can alone cause drastic changes in the gene frequencies of a population.
- E) are always beneficial.

7) Microevolution is

- A) the addition of an acquired characteristic.
- B) changes in allele frequency in individuals.
- C) changes of allele frequency in populations.
- D) creation of a new species.
- E) creation of a new allele.

8) Two nearby populations in which there is some movement of individuals between the populations are an example of

- A) disruptive selection.
- B) bottleneck effect.
- C) genetic drift.
- D) gene flow.
- E) founder effect.

9) The term natural selection is not interchangeable with the term evolution because

- A) natural selection is just a theory, while evolution has been proven.
- B) a population may evolve in ways other than through natural selection.
- C) Darwin coined the term natural selection, but not evolution.
- D) natural selection does not always lead to evolution.
- E) The two are exactly the same and may be used interchangeably.

10) Which of the following traits probably arose through sexual selection?

- A) speed in cheetahs
- B) camouflage in walking stick insects
- C) brighter plumage in male birds than in female birds of the same species
- D) migration in whales
- E) schooling behavior in fish

11) Fruit fly species all look more or less alike. If you have a male and female fruit fly what would be the best way to determine that they are the same species?

- A) If they can both asexually reproduce and their offspring can also successfully asexually reproduce, then they are all the same species.
- B) Examine them closely with a low power microscope comparing their physical characteristics to published species key lists of characteristics.
- C) Base sequence the DNA of their chromosomes.
- D) If they mate successfully and their offspring can also mate successfully, all are the same species.
- E) If they mate when they are put together then they are the same species.

- 12) Which of the following is NOT capable of evolving?
- A) a population of asexually reproducing bacteria
 - B) a population of fruit flies
 - C) the collective cats of a city
 - D) a plant species that only reproduces asexually
 - E) Dr. Wadsworth
- 13) Which of these definitions of species most closely fits the biological species concept?
- A) Members of the same species are all morphologically similar.
 - B) Members of the same species are all genetically identical.
 - C) Members of the same species look almost exactly alike.
 - D) For asexually reproducing organisms, members of the same species are based on DNA and RNA base sequence analysis.
 - E) Members of the same species can mate and produce fertile offspring.
- 14) Evolution works on:
- A) genes of individuals
 - B) phenotypes of individuals
- C) allele frequencies in population
- D) birds with small beaks
- E) birds with large beaks
- 15) Theoretically, the production of sterile mules by interbreeding between female horses and male donkeys should
- A) result in the extinction of one of the two parental species
 - B) cause convergent evolution
 - C) maintain horses and donkeys as two separate species.
 - D) Weaken the intrinsic reproductive isolation between horses and donkeys
 - E) Eventually result in the formation of a new species of mules.
- 16) The peacock's beautiful tail is really a trade-off between
- A) kin selection and natural selection.
 - B) natural selection and genetic drift.
 - C) sexual selection and natural selection.
 - D) directional selection and natural selection.

15. List five mechanisms by which gene frequencies in a population can be altered.

16. Two varieties of grasshoppers are found in the Kansas; one variety is brown and the other is green. Some scientists hypothesize that the two varieties represent different phenotypes of the same species. Describe an experiment that could test this hypothesis. What results would support the hypothesis that the two varieties are the same species of grasshopper?