

AP Biology: Unit – 2 - Natural Selection Practice Test

Question 1

**The theory of evolution by natural selection means that what is changing over time?**

- A. The inherited traits of a population.
- B. The acquired traits of a population.
- C. Hair color and eye color
- D. Attractive features.

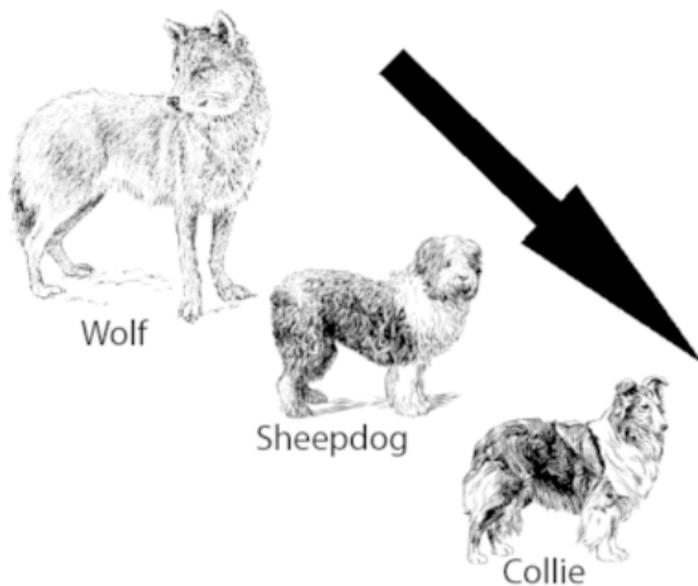
Question 2

**Why are advantageous traits more likely to be passed onto offspring?**

- A. Because they are more likely to survive and reproduce.
- B. Because they come from dominant alleles.
- C. Because they come from recessive alleles.
- D. Because the trait is an acquired phenotype.

Question 3

**Gradualism means Natural Selection would normally happen over many generations and very**



- A. slowly

- B. quickly
- C. in space
- D. beyond time

Question 4

**According to natural selection, light colored tree trunks would favour**

- A. light colored moths
- B. dark colored moths
- C. red colored moths
- D. red and light colored moths

Question 5

**Over the years, white mice became extinct and darker mice survived. This is**



- A. stabilizing selection
- B. directional selection
- C. disruptive selection
- D. due to exercise

Question 6

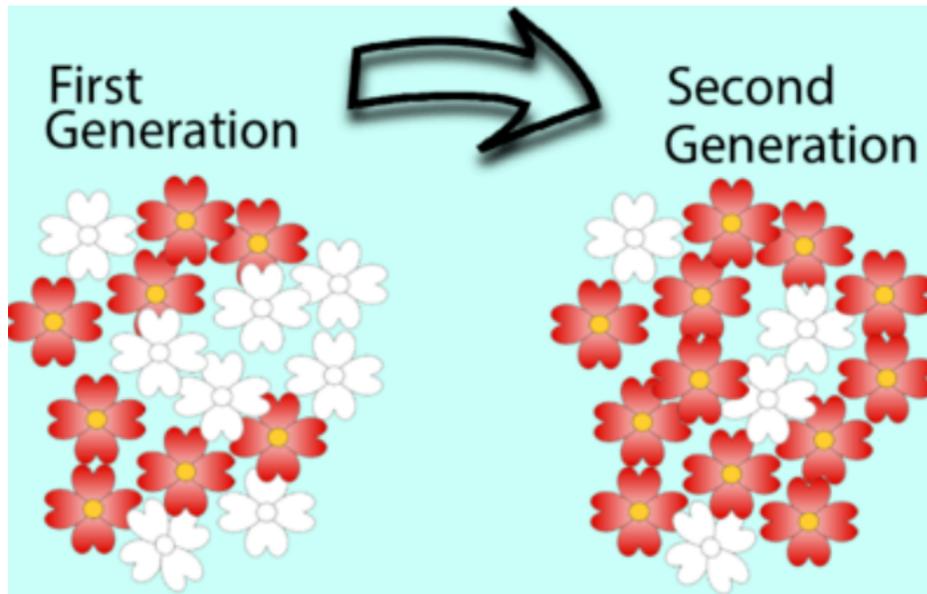
**A physical trait favored by an environmental change can be called an**

- A. adaptation
- B. extinction
- C. possibility

D. mutation

Question 7

**Changes in the gene pool over time.**



- A. Mitosis
- B. Genetic Variation
- C. Gene Pool
- D. Genetic Drift

Question 8

**Mutations are a change in what?**

- A. DNA
- B. tRNA
- C. genotype
- D. phenotype

Question 9

**Which organisms are most likely to survive?**

- A. the best adapted
- B. the fastest
- C. the strongest
- D. the most domesticated (tamed)

Question 10

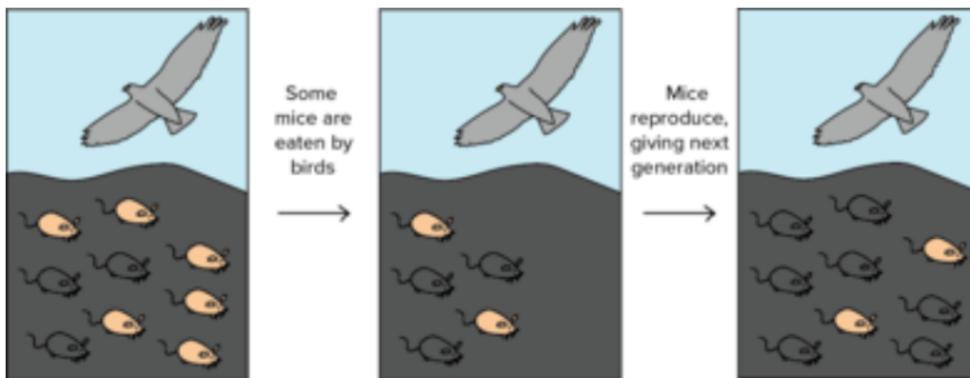
The trees these moths used to live on were white, but have been covered in soot from coal factories. Which moth will be more successful in this environment?



- A. Dark moth
- B. Light moth
- C. Both will be equally successful
- D. Neither will be successful

Question 11

Why is the mouse population changing over time?



- A. The light mice can reproduce more successfully than the dark mice
- B. The hawks eat more dark mice than light mice because the dark mice taste better
- C. The hawks eat more light mice than dark mice because they can see the light mice more easily
- D. The hawks eat more dark mice than light mice because they can see the dark mice more easily

Question 12

These moths are all the same species. The differences between their wings is an example of \_\_\_\_\_



- A. Natural Selection
- B. Variation
- C. Homeostasis
- D. Extinction

Question 13

A scientist is studying two populations of Laysan finches in the Hawaiian islands. The populations are isolated from each other, but live under similar environmental conditions.

Over a 20-year period, the scientist gathers allele frequency data for a certain gene, which has alleles B and b. A subset of the scientist's results for the two populations is shown in the following table.

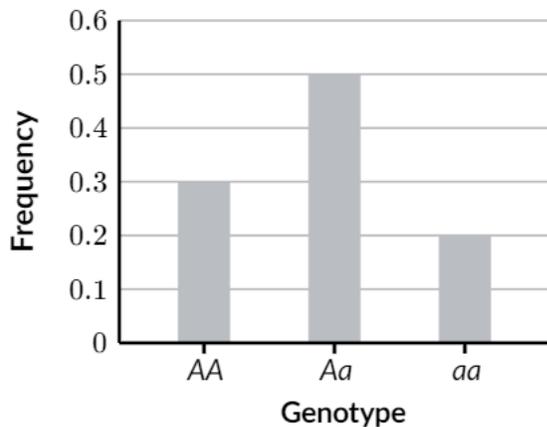
Year	Population 1		Population 2	
	Frequency of Allele B			
1995	0.71	0.39	0.67	0.33
2015	1.00	0.00	0.18	0.82

Which of the following statements is best supported by the table?

- A. Allele *b* was lost from Population 1 because of Population 1's large size.
- B. Allele *B* became fixed in Population 1 as a result of genetic drift.
- C. Allele *B* was maintained in Population 1 and Population 2 because of gene flow between the populations.
- D. Allele *b* conferred a selective disadvantage to finches in both populations during the study period.

Question 14

In a population of frogs, a certain gene has two alleles: a dominant allele (*A*), and a recessive allele (*a*). The genotype frequencies in the frog population for this gene are shown in the following graph.



Assuming that the population is in Hardy-Weinberg equilibrium, which of the following is the frequency of the *AAA* allele in this population, rounded to two decimal places?

- A. 0.30
- B. 0.45
- C. 0.55
- D. 0.80

Question 15

The following table indicates the presence or absence of selected traits for a set of animal species.

Species	Traits (+/- indicates present/absence)					
	Mammary glands	Amniotic egg	Vertebrae	Gizzard	Feathers	Four limbs
Alligator	-	+	+	+	-	+
Chimpanzee	+	+	+	-	-	+
Tuna	-	-	+	-	-	-
Finch	-	+	+	+	+	+

The data about which trait provides the strongest evidence that all of the animal species in the table share a common ancestor?

- A. amniotic egg
- B. gizzard
- C. vertebrae
- D. feathers

#### Question 16

Common carp (*Cyprinus carpio*) are fish that have small, evenly-spaced scales covering their entire bodies. Fish farmers bred a population of common carp over many generations to have only a few patches of large scales on their bodies. Common carp with this patchy scale phenotype are called mirror carp.

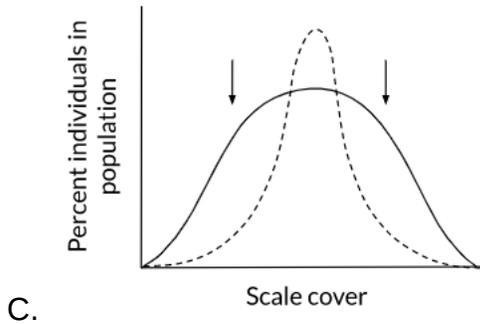
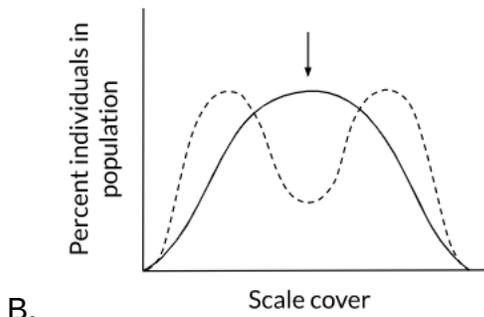
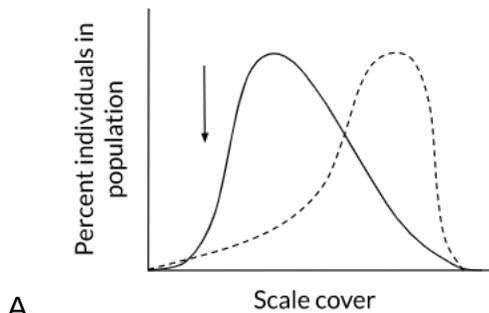
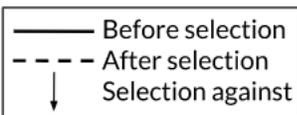
Some of these mirror carp escaped captivity and established a wild population in a local lake. A scientist predicted that individuals in this wild mirror carp population would, over time, evolve to have scales covering their entire body due to selective pressures in the wild.

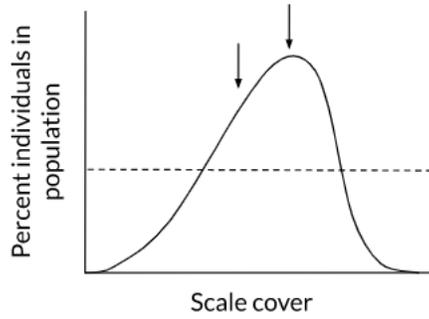
To study this, the scientist collected phenotypic data on the wild population at four time points, each ten years apart so as to include multiple generations of carp. The scale phenotypes were categorized as either partial cover (scales covering less than 10%, percent of the fish's body), intermediate cover, or full cover (scales covering greater than 90%, percent of the fish's body). These data are shown in the table below.

Percent of fish with different scale cover phenotypes at four time points

Time point	Partial scale cover (mirror)	Intermediate scale cover	Full scale cover
1	71%	27%	2%
2	52%	20%	28%
3	23%	18%	59%
4	5%	7%	88%

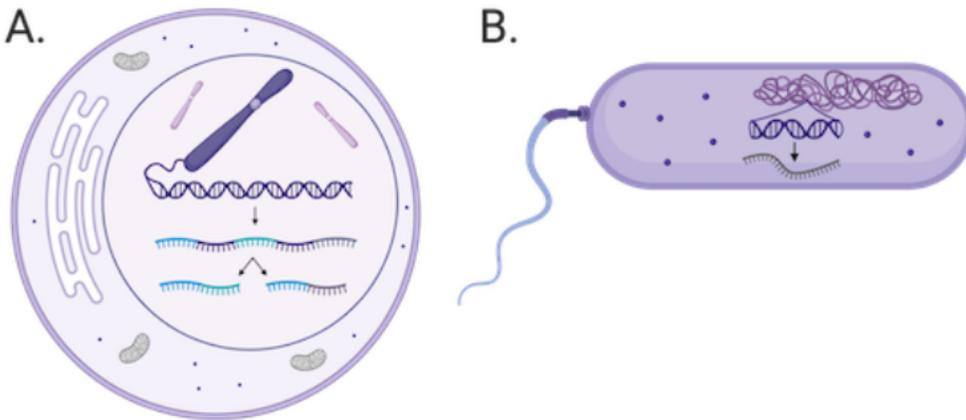
Based on the information given, which of the following graphs best shows the type of selection occurring on the wild carp population?





### Question 17

The following diagrams represent the generation of mature mRNA in a eukaryotic cell (A) and a prokaryotic cell (B).



**Of the structures depicted in the diagrams, which were likely present in the common ancestor of all eukaryotes, but not in the common ancestor of all organisms?**

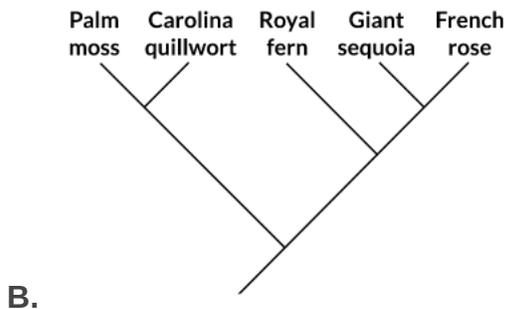
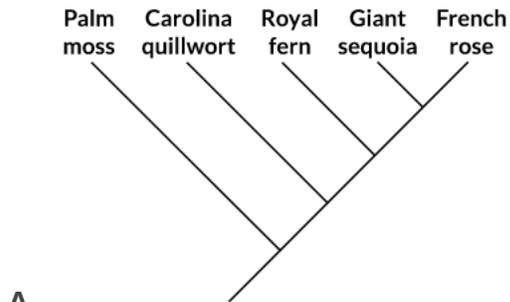
- A. a circular chromosome, a peptidoglycan cell wall, and a flagellum
- B. ribosomes, cytosol, and double-stranded DNA
- C. RNA molecules, a cell membrane, and cytoplasm
- D. spliceosomal introns, membrane-bound organelles, and linear chromosomes

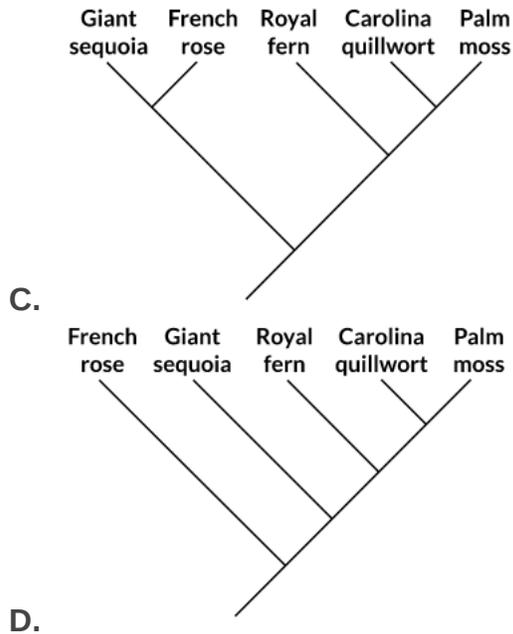
Question 18

The following table shows a set of derived characters for several species of land plants.

Species	Derived characters (+ indicates the character is present)					
	Vascular tissue	Seeds	Carpels	Woody tissue	Stamens	Mega-phylls
Carolina quillwort	+					
French rose	+	+	+	+	+	+
Palm moss						
Giant sequoia	+	+		+		+
Royal fern	+					+

Based on the information in the table, which of the following cladograms best represents the evolutionary relationships among the species?





### Question 19

A group of researchers is studying fish populations in two small, adjacent mountain lakes. Historically, seasonal flooding temporarily joined the lakes, allowing for repeated cycles of interbreeding and isolation between the lakes' fish populations. The area's climate has become drier, so the seasonal flooding no longer occurs.

**Which of the following best predicts how the lack of seasonal flooding will affect the fish populations in the lakes over time?**

- A. Gene flow between the lakes' fish populations will increase, resulting in allopatric speciation.
- B. The fish population in each lake will adapt to different food sources, resulting in sympatric speciation.
- C. The fish population in each lake will become reproductively isolated, resulting in allopatric speciation.
- D. Genetic drift will increase the genetic diversity within each lake's fish population, resulting in sympatric speciation.

## Answer Key

1. A
2. A
3. A
4. A
5. B
6. A
7. D
8. A
9. A
10. A
11. C
12. B
13. B
14. C
15. C
16. A
17. D
18. A
19. C