BILD 3 Midterm Review

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1.

Today's scientists theorize that life on Earth may have first arose:

A. From outer space by means of a meteor, comet, or asteroid

B. By special creation

C. Spontaneously from nonliving organic molecules

D. Either A or C

E. None of above

2.

Place the following events in order from earliest to latest:

1. Production of O2 by cyanobacteria
2. Synthesis of small organic molecules
3. Origin of self-replication
4. Packaging into “protobionts” with membranes
5. Joining of molecules into polymers

2, 5, 4, 3, 1

3.

Which of the following is not integral to natural selection?

a) More offspring are produced than can survive.

b) Variations can be passed from one generation to the next.

c) Some individuals survive longer than others.

d) Phenotypic variation exists in the population.

4.

Natural selection that acts against intermediate phenotypes and favors extreme variants, is called:

a) directional selection

b) heterozygote disadvantage

c) disruptive selection

d) stabilizing selection

f) balanced polymorphism

5.

Genetic drift that results from a temporary reduction in population size is called:

a) heterozygote advantage

b) gene pool

c) gene flow

d) founder effect

e) population bottleneck

6.

What percent of radon (a radioactive isotope) has decayed after 3 half-lives?

a) 12.5%

b) 25%

c) 50%

d) 75%

e) 87.5%

7.

A grouping that includes an ancestral species and some, but not all of the descendants is

a) monophyletic

b) paraphyletic

c) polyphyletic

d) convergent group

e) outgroup

Pre/Post Isolation & Type

Two similar species of lizards have different mating rituals

Pre, Behevioral

One species of plant flowers in early April; another species flowers in late May

Pre, Temporal

Two species of frogs occasionally hybridize, but the offspring do not complete development

Post, hybrid zygote death

Two species of big cats that breed in the zoo but their embryos abort

Pre, Gametic

Pre/Post Cont.

One species of frog breeds in woodland ponds, whereas another species of frog breeds in swamps

Pre, Geographic

Two species of sea urchin release their gametes at the same time, but the sperm from each species is unable to penetrate the egg coat of the other

Pre, Gametic

Two species of birds where males sing different songs to attract female mates

Pre, Behevioral

Pre/Post Cont.

Males of one species are too small to mate with females of another bigger species

Pre, Mechanical

Two fish species mate in an aquarium but produce sterile offspring

Post, hybrid sterility

H-W Problem

Suppose in a large population of iguanas, skin color is dependent on a single gene, where the AA genotype is green, Aa is yellow, and aa is white. The white-colored individuals are easy to spot by predators. They only have a 50% chance of survival, but yellow and green individuals have a 100% chance. Using the genotype frequencies provided, construct a fitness array and calculate the new genotype frequencies for the next generation.

AA = p^2
Aa = 2pq
aa = q^2(1-s)

Word Problems

In an unexpected hurricane, ten iguanas were blown off the mainland and floated off to sea on a tree branch. After floating for weeks, they finally landed on a small island.

a) As the new population settles and begins to grow, what are the long-term problems likely to face this small population?

Lack of genetic variation
Fixation of deleterious traits

b) This new island population has experienced a _____.

Founder effect

Why can a deleterious allele sometimes be fixed in a population?

Explain the following statement: “Prezygotic isolation may evolve to reinforce postzygotic isolation.”