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midterm 1 v2 for review

Part 1 of 1 - **0.0 Points**

Question 1 of 35

Which of the following properties or processes do we associate with livin

- A. responding to the environment
- B. evolutionary adaptations
- C. energy processing
- D. growth and reproduction
- ✔ E. all of the above

Answer Key: E

Question 2 of 35

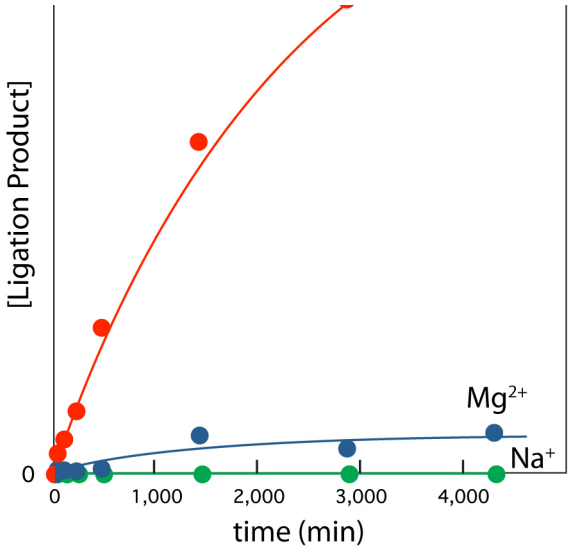
One criticism of the RNA World hypothesis is that ribozymes have slow re group of scientists at Georgia Tech hypothesized that, in the conditions t biotic Earth, ribozymes may have had faster reaction rates. According to Strong Inference, these scientists should design experiments to:

- ✔ A. disprove various alternative hypotheses.
- B. prove the most likely hypothesis.
- C. observe how nature works.
- D. all of the above
- E. B and C above

Answer Key: A

Question 3 of 35

Modern ribozymes depend on divalent (having 2 + charges) ions such as M scientists tested whether ribozymes could use a form of soluble iron (Fe2 right shows the ligation activity of an RNA molecule called an L1 Ribozym or Fe2+ ions are added. What is the independent variable in this experim



- A. the amount of ligation product
- ✔ B. the type of ions added
- C. the rate of the reaction
- D. the RNA molecule
- E. a variable that is kept constant during the experiment

Answer Key: B

Question 4 of 35

What is the dependent variable in this experiment?

- ✔ A. the amount of ligation product
- B. the ion added
- C. time
- D. the RNA molecule
- E. a variable that is kept constant during the experiment

Answer Key: A

Question 5 of 35

What best describes the role of sodium ions (Na+) in this experiment?

- A. Independent variable
- B. Dependent variable
- C. Negative control
- ✘ D. Positive control

Answer Key: C

Question 6 of 35

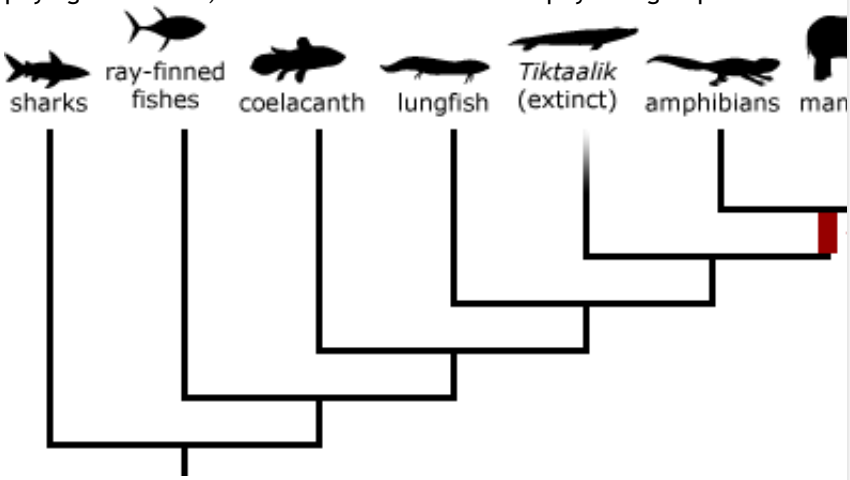
The Fe2+ ions precipitated out of the ocean waters when they combined
iron oxide (rust). This had to happen before any oxygen produced in the
into the atmosphere, and was completed about 2.1-2.5 billion years ago.
consequence of this early increase in free oxygen?

- ✓ A. origin of eukaryotes
- B. origin of life (the first cells)
- C. the Cambrian explosion
- D. the end-Permian extinction
- E. the colonization of land by the first tetrapods

Answer Key: A

Question 7 of 35

Use the vertebrate phylogeny below to answer the next three questions.
phylogenetic tree, which of these form a monophyletic group?



- A. sharks, ray-finned fishes, coelacanth, lungfish
- B. Tiktaalik and amphibians
- ✓ C. Tiktaalik, amphibians, mammals, lizards and relatives
- D. sharks, ray-finned fishes, coelacanth, lungfish and Tiktaalik
- E. all of the above

Answer Key: C

Question 8 of 35

Of the choices listed below, which is the most closely related to the extı

- ✗ A. lungfish
- B. mammals

C. either lungfish or amphibians; these are equally closely relat

D. sharks

Answer Key: B

Question 9 of 35

Which of the following statements are accurate interpretations of this ph

A. sharks are the most primitive (least evolved)

B. lungfish are the closest living relatives of present-day coelac

C. organisms with four legs (tetrapods) evolved from extinct Tik

D. mammals evolved before lizards

E. mammals are more closely related to lizards than to amphibi

Answer Key: E

Question 10 of 35

The half-life of carbon-14 is 5700 years. A friend has purchased a papyrus thinks is about 11,000 years old. If your friend is right, what ratio of carb would you expect to find?

A. same as present-day carbon-14/carbon-12 ratio

B. 50% of present-day carbon-14/carbon-12 ratio

C. 25% of present-day carbon-14/carbon-12 ratio

D. 75% of present-day carbon-14/carbon-12 ratio

E. 33% of present-day carbon-14/carbon-12 ratio

Answer Key: C

Question 11 of 35

The fossil and geological records show that end-Permian mass extinction association with:

A. Vulcanism.

B. Climate change.

C. Changes in ocean chemistry

D. All of the above.

E. None of the above.

Answer Key: D

Question 12 of 35

At what point in the origin of life could evolution by natural selection beg

- A. a protein that could replicate DNA molecules
- ✔ B. an RNA molecule that could self-replicate inside a proto-cell.
- C. a DNA molecule that could self-replicate inside a proto-cell
- D. a pool of monomeric ribonucleotides polymerizing into RNA st

Answer Key: B

Question 13 of 35

Which of the following processes play(s) a critical role in the evolution by

- A. Overproduction and competition among organisms.
- B. Differences in reproductive success of individuals.
- C. Random mutation that produce new characteristics that have hereditary component.
- ✔ D. All of the above.
- E. only B and C above.

Answer Key: D

Question 14 of 35

Which of the following are required for biological evolution to occur?

- A. A large population.
- B. Random mating.
- ✔ C. Variation in traits that are inherited
- D. Variation in traits acquired during an individual's lifetime
- E. A, B and C but not D.

Answer Key: C

Question 15 of 35

Which of the following is (are) true of natural selection (NS)?

- A. NS inevitably results in greater complexity in living organisms
- ✔ B. NS results in better adaptation of the population to its enviro
- C. NS occurs when all variants enjoy equal reproductive success
- D. NS is a random process
- E. All of the above

Answer Key: B

Question 16 of 35

Which of the following similarities are NOT homologous, but instead aros convergent evolution?

- A. the tail fins of sharks and dolphins
- B. the underlying bone structures of human arms and bat wings
- C. the echo-location capabilities of bats and dolphins
- D. A and B
- E. A and C

Answer Key: E

Question 17 of 35

Rabbits are not native to Australia. They were imported by European sett rabbits, and became such a serious threat to Australia's native ecosystem built to span the length of the continent to prevent rabbits from spreadir 1950's a biological weapon was released: a virus that was 90% lethal to ra virus was initially highly successful in knocking down the rabbit populatio population bounced back over the next 20 years. Examination of both the and the virus population in the 1970's revealed that the rabbits had beco and the virus had also become less lethal, when tested on rabbits that ha exposed to the virus.. What explains the resistance of the rabbit populati release of the virus?

- A. The rabbits that initially survived the virus acquired immunit their immunity to their progeny.
- B. The rabbits that were already resistant to the virus survived produced more progeny, who were also resistant
- C. Some rabbits acquired resistant mutations when other rabbit the virus.
- D. The rabbits must have learned how best to take care of them overcome the viral infection.

Answer Key: B

Question 18 of 35

How or why did the virus become less lethal when tested on hosts that ha exposed.

- A. Viruses reduced their lethality in order to maintain a host po virus infections.
- B. Viruses became less lethal in order to prevent their hosts fro resistant.
- C. Viruses with mutations that allowed their hosts to survive pr progeny viruses that went on to infect other hosts, than did viru immediately killed their hosts.
- D. Viruses always mutate in order to adapt to their hosts and liv without killing their hosts, because this is good for the long-ter virus species as a whole..

Answer Key: C

Question 19 of 35

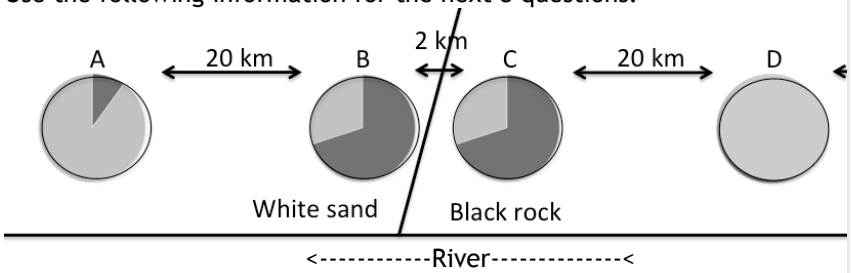
Which of the following would be most likely to be successful in eradicatir
given area?

- A. releasing 3 different strains of the same highly lethal virus, a
- B. releasing 3 different strains of the same highly lethal virus, s
years
- C. releasing a mixture of lethal and sub-lethal virus strains, all
- ✗ D. releasing a sub-lethal strain of virus first, and following up w
strain

Answer Key: A

Question 20 of 35

Use the following information for the next 8 questions:



Five populations A-E of damselflies are located along a river bank. The sp
genetically determined and heritable morphs, light and dark, with ratios
diagrams above. The upstream populations C, D, and E are situated on bl
downstream populations A and B live on white sand. Bird predators use v
the damselflies. Damselflies who attempt to leave their habitat can migr
success and up to 5 km with 1% success. No damselflies have been observ
than 10 km. All five populations are large in size with approximately the
individuals. Which evolutionary mechanism can best explain why light mo
abundant than dark morphs in Population A in the presence of bird preda

- A. Genetic drift
- B. Migration
- C. Mutation
- ✓ D. Natural selection
- E. None of these.

Answer Key: D

Question 21 of 35

If birds prey on population D, an observer would detect

- ✗ A. Natural selection as birds select against the light morph in th
habitat.
- B. Mutation from light to dark morphs.
- C. Migration of dark morphs from population C or E.
- D. Slight shifts in the allele frequency of the dark morph, consis

drift

E. None of these.

Answer Key: E

Question 22 of 35

You observe that populations B and C have 64% dark morphs. Based on th
hypothesize that these two populations have the same percentage of dar
of___

A. Natural selection.

B. Genetic drift

✔ C. Gene flow.

D. Mutation.

E. Natural Selection and Genetic Drift.

Answer Key: C

Question 23 of 35

Calculating the Hardy-Weinberg proportions in population B is useful to t
population is experiencing

A. Genetic drift.

B. Mutation.

C. Migration.

D. Natural selection.

✔ E. One or more of these, but cannot determine which one.

Answer Key: E

Question 24 of 35

You survey Population A again several years later to find one individual o
species with a metallic blue color. Which evolutionary mechanism is mos
responsible for this development?

A. Natural Selection

B. Genetic Drift

C. Migration

✔ D. Mutation

E. A and B.

Answer Key: D

Question 25 of 35

Assume the dark morph is encoded by allele D in genotypes DD or Dd, and homozygotes. In which populations does allele D occur?

- A. All of them.
- B. Populations A, B, C
- C. Population E only
- ✔ D. All except D.
- E. None of them.

Answer Key: D

Question 26 of 35

If the proportion of light dd individuals is 36%, and assuming the absence should the proportion of DD homozygotes be?

- ✔ A. 0.16
- B. 0.36
- C. 0.40
- D. 0.48
- E. 0.60

Answer Key: A

Question 27 of 35

When considering Hardy-Weinberg equilibrium, we assume that, among o

- A. Individuals select mates at random
- ✘ B. Individuals mate with those more similar to them
- C. Individuals mate with those different from them
- D. Mate choice does not matter for Hardy-Weinberg equilibrium

Answer Key: A

Question 28 of 35

Use the following information to answer the next 4 questions: Two morph snail Littorina saxatilis have been identified on rocky intertidal shores in et al. (1995) made the following observations about these snails:

- One morph consists of snails with smooth, unbanded shells. These the low intertidal in a zone inhabited by blue mussels (a clam-like morph consists of snails with ridged, banded shells that are found intertidal, in the zone in habited by barnacles.
- The two morphs overlap in a narrow midshore band at the border and barnacle zones

and barnacle zones.

- All snails feed on algae, although algal species differ between the lab, the morphs thrive on algae from either zone.
- Mating takes place in the blue mussel zone, in the barnacle zone, band. Snails encounter significant numbers of the other morph on band.
- Mating in the midshore band is not random. Females prefer to ma same morph, and only 8% of the snails in the midshore band are h
- Some female hybrids have been observed with embryos in their br indicating that they are not sterile. However, the survival rates of the survival rates of pure morphs are unknown.

The phylogenetic species concept best refers to

- A. What the snails look like
- B. Whether the snails can interbreed
- ✔ C. How evolutionarily distinct the snails are according to DNA se
- D. A and B
- E. B and C

Answer Key: C

Question 29 of 35

The most useful species concept for fossil organisms is

- A. The phylogenetic species concept
- ✔ B. The morphological species concept
- C. The biological species concept
- D. The ecological species concept
- E. B and C

Answer Key: B

Question 30 of 35

Based on the available evidence, the argument against saying the morphs biological species (BSC) is

- A. Reproductive isolation is evident because the hybridization r
- B. They hybridize and hybrids may be fertile.
- ✘ C. Adults grandchildren of a mating between the different morp been observed.
- D. The morphs look completely different from each other.
- E. There is no argument against the BSC

Answer Key: B

Question 31 of 35

Based on the available evidence, the argument for saying the morphs are species (ESC) is

- A. The morphs overall look very similar, with only a few distingu characteristics.
- ✗ B. Both morphs eat algae.
- C. The morphs are mainly found in two different locations in th
- D. The morphs are not fully reproductively isolated.
- E. There is no argument for the ESC

Answer Key: C

Question 32 of 35

Which of the following statements about the Cambrian Radiation is/are c

- A. The animal groups that first appeared in the fossil record in t have no clear relationship to the body plans of existing animal p
- B. Most of the species that first appeared in the early Cambrian
- C. Atmospheric oxygen concentrations declined in the early Can the overall toxicity of the atmosphere and allowing the evolutic multicellular organisms.
- ✗ D. All of the above

Answer Key: B

Question 33 of 35

Microfossils with cells that appear to have nuclei would indicate what do

- A. Archaea
- B. Bacteria
- C. Plants
- D. Animals
- ✓ E. Eukarya

Answer Key: E

Question 34 of 35

The oldest fossils of eukaryotic cells appear

- A. In the early Cambrian.
- ✓ B. about 2 billion years ago, after the first small rise in atmosph
- C. 6,000 years ago.
- D. in rocks older than 3.5 billion years, or before oxygenic photo
- E. after the end-Permiant extinction

Answer Key: B

Question 35 of 35

Which of the following organisms appeared first in the fossil record?

A. Dinosaurs

✔ B. Prokaryotes