

GEOL 1122 Mid-Term Exam II  
 Tuesday, October 9, 2018 9:30-10:45 am  
 28 Questions 4 pages 100 points  
 Read all questions carefully!

Check one:

I am content to have my graded exam placed in a lettered box to which other students will have access.

I will wait in a line, in alphabetical order by last name, to have my graded exam handed to me after other student's exams are placed in lettered boxes.

Name \_\_\_\_\_

Fold front page forward so name does not show.

1. Projected on the screen are reconstructions of some Mesozoic organisms. For each illustration, put an "O" if the organism is an ornithischian dinosaur, an "S" if it is a saurischian dinosaur, an "I" if it is an ichthyosaur, a "T" if it is a pterosaur, an "M" if it is a mosasaur, or an "L" if it is a plesiosaur. [6]

- |         |         |         |
|---------|---------|---------|
| _____ A | _____ E | _____ I |
| _____ B | _____ F | _____ J |
| _____ C | _____ G | _____ K |
| _____ D | _____ H |         |

2. The illustration on the screen shows, on the left, three modern organisms and, on the right, three Mesozoic organisms. Of these, one of the organisms on the left is, according our current scientific understanding, an evolutionary/genealogical descendant one on the right. Fill in the two blanks below. [3]

\_\_\_\_\_ is a descendant of \_\_\_\_\_.

3. The plot shown on the screen was used to make two points in our lecture. Those two were [4]

- \_\_\_\_\_ A. The brain structure of *Homo sapiens* is incompatible with evolution from primates.
- \_\_\_\_\_ B. The brain structure of *Homo sapiens* is compatible with evolution from primates.
- \_\_\_\_\_ C. Among primates, simians are cognitively superior to prosimians.
- \_\_\_\_\_ D. Compared to other primates, humans have exceptionally large brains that make them capable of ethical reasoning and intelligent behavior.

4. The main implication that we drew from our discussion of artificial selection in dogs, which has derived dogs as diverse as poodles, dachshunds, and greyhounds from domesticated wolves, was . . . [4]

- \_\_\_\_\_ A. that inheritance of acquired traits is a good model to explain biological evolution.
- \_\_\_\_\_ B. that inheritance of acquired traits is not a good model to explain biological evolution.
- \_\_\_\_\_ C. that Cope's Law holds in non-natural, as well as natural, evolutionary systems.
- \_\_\_\_\_ D. that human-controlled selection analogous to natural selection has resulted in remarkable structural variation in organisms in a geologically very short time.
- \_\_\_\_\_ E. that most physical features of animals are inherited from the mother rather than the father because of the effects of mitochondrial DNA.

5. The generation of new species as the result of separation of populations into different areas is known as [3]

- \_\_\_\_\_ A. Natural selection
- \_\_\_\_\_ B. Punctuated equilibrium
- \_\_\_\_\_ C. Sympatric speciation
- \_\_\_\_\_ D. Chromosomal fusion
- \_\_\_\_\_ E. Allopatric speciation
- \_\_\_\_\_ F. Phyletic gradualism

6. Which of the following might be traits or abilities that would make an individual or population more fit to survive in its environment - that is, traits or abilities that would be keys to "survival of the fittest"? Check all that apply. [5]

- \_\_\_\_\_ Sharper teeth for hunting and defense
- \_\_\_\_\_ More powerful muscles for running or jumping
- \_\_\_\_\_ Stomach enzymes for more thorough digestion of food
- \_\_\_\_\_ Cooperative tendencies in hunting or in building shelter
- \_\_\_\_\_ Better communication skills with other organisms of its species
- \_\_\_\_\_ Tendency and ability to care for one's offspring.
- \_\_\_\_\_ Body coloration similar to the foliage of the organism's environment
- \_\_\_\_\_ More effective senses to detect predators or resources

7. From what time comes our earliest geologic evidence of life on Earth? [3]  
 A. Twelve to fourteen thousand (12,000 to 14,000) years ago.  
 B. Six to eight million (6,000,000 to 8,000,000) years ago.  
 C. 540 million (540,000,000) years ago.  
 \_\_\_\_\_ D. Two billion (2,000,000,000) years ago.  
 E. 3.5 to 3.8 billion (3,500,000,000 - 3,800,000,000) years ago.  
 J. 4.5 billion (4,500,000,000) years ago  
 K. 12.3 billion (12,300,000,000) years ago
8. Our earliest evidence of life on Earth (from the time to which Question 7 alludes) includes . . . (check all that apply) [3]  
 \_\_\_\_\_  Footprints of dinosaurs  Fossils of trilobites  
 \_\_\_\_\_  Microfossils of prokaryotes  Small stromatolites  
 \_\_\_\_\_   $^{13}\text{C}$ -depleted deposits of carbon  Jawbones of cynodonts  
 \_\_\_\_\_  Radiocarbon( $^{14}\text{C}$ )-dating of early fossils
9. Genetic studies of modern organisms suggest that the last universal common ancestor of all life on Earth was [3]  
 \_\_\_\_\_ A. A green alga that lived in a little pond that was warmed by the sun and contained dissolved ammonia and phosphoric salts, subjected occasionally to lightning.  
 B. A slime mold that lived in a presumably equatorial setting with granitic bedrock, abundant rainfall, and warm temperatures.  
 C. A primitive moss-like plant found in paleosols that are now exposed in sedimentary rocks in Greenland.  
 D. A prokaryote that lived at mid-ocean ridge hydrothermal vents and depended on the geochemistry of vent waters to sustain its biological functions.
10. Lynn Margulis's Sequential Endosymbiosis model of the origin of eukaryotes (organisms with nuclei), which we discussed in class, calls for [3]  
 \_\_\_\_\_ A. engulfment of some prokaryotes (bacteria) to form the organelles of eukaryotic cells, including formation of mitochondria and chloroplasts.  
 B. development of symbiotic relationships, including those of algae and fungi in lichens, and dinoflagellates in coral tissue.  
 \_\_\_\_\_ C. progressive replacement of the nuclei of prokaryotes with the DNA of eukaryotes.  
 D. evolution of the first photosynthesizers from heterotrophic bacteria.
11. Examples of how single-celled organisms or single cells can unite to become multicellular structures that we discussed included [3]  
 \_\_\_\_\_ A. Slime molds  E. A and B  
 B. Sponges.  F. B and D  C J. A, B, and C  
 \_\_\_\_\_ C. Green algae  G. A and D  C
12. From which eon comes the earliest evidence of life on Earth? [3]  
 \_\_\_\_\_ A. Archean B. Quaternary C. Phanerozoic D. Proterozoic E. Paleozoic
13. In what geologic period did fossils with hard parts become common? [3]  
 \_\_\_\_\_ A. Archean B. Bottomian C. Cambrian D. Devonian K. Cretaceous  
 M. Mesoproterozoic N. Neogene P. Permian S. Silurian
14. Our discussion of rates of speciation and our discussion of the metabolic condition (ectothermy vs. endothermy) of dinosaurs both led to the conclusion that [3]  
 \_\_\_\_\_ A. When presented with two choices, one should always consider intermediate possibilities.  
 B. When asked about anything, one should always ask, "What's the evidence?"  
 \_\_\_\_\_ C. When considering any historical question, one should always remember that we will know more about more recent events.  
 D. One should always apply Ockham's Razor



