

DO NOT WRITE ON THIS EXAM.

## Taxonomy & Evolution Exam - VERSION A

**Directions:** Answer the following questions on your scantron to the best of your ability.

1. The classification levels of three organisms are listed in the following chart. Which statement describes the relationship among the organisms in the chart?

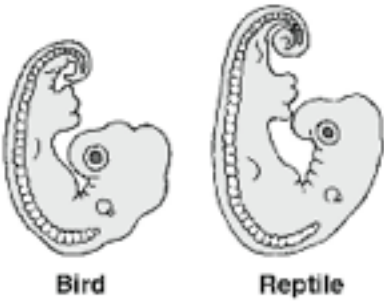
**Classification of Cats**

| House Cat         | Lion         | Tiger         |
|-------------------|--------------|---------------|
| Animalia          | Animalia     | Animalia      |
| Chordata          | Chordata     | Chordata      |
| Mammalia          | Mammalia     | Mammalia      |
| Carnivora         | Carnivora    | Carnivora     |
| Felidae           | Felidae      | Felidae       |
| <i>Felis</i>      | <i>Felis</i> | <i>Felis</i>  |
| <i>domesticus</i> | <i>leo</i>   | <i>tigris</i> |

- a. house cats and tigers belong to the same genus but to different orders
- b. house cats, tigers, and lions belong to the same class and family
- c. house cats are more closely related to tigers than they are to lions
- d. house cats and lions belong to the same species

2. The diagram illustrates an embryonic stage of two organisms. Which of the following can be determined by observing the embryos shown in the diagram?

**Embryos**



- a. the organisms share a common ancestry
- b. the organisms belong to the same genus
- c. the organisms are native to the same geographic area
- d. the organisms will grow into anatomically similar adults

3. In the book *On the Origin of Species*, Charles Darwin described how species change over time. Which of the following is NOT part of his observations that describe the mechanisms of natural selection?

- a. organisms produce more offspring than can survive
- b. disease and natural disaster will limit population growth
- c. species today descended with modifications from ancestral species
- d. organisms with advantages will survive and reproduce

4. Sea sponge bodies are irregular, and their left and right halves are not necessarily similar. What is this body style a classic example of?

- a. vascular symmetry
- b. radial symmetry
- c. bilateral symmetry
- d. asymmetry

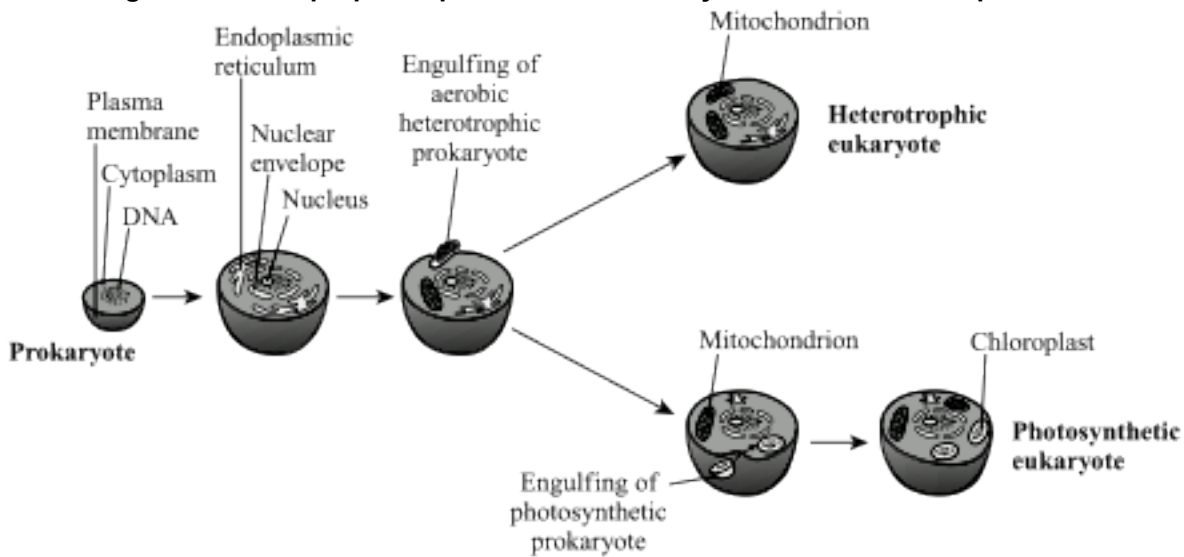
5. Dr. Musgrove finds a new species of plant. The plant has true roots, stems, and leaves and reproduces by producing seeds in cones. The new species most likely belongs to which of the following classification groups?

- a. green algae
- b. gymnosperm
- c. angiosperm
- d. fern

6. Which type of organism has a segmented body, appendages on at least one segment, and a hard exoskeleton?

- a. mollusk
- b. cnidarian
- c. sponge
- d. arthropod

7. The diagram shows a proposed process in the history of evolution. Which process is outlined in the diagram?



- a. chemosynthesis
- b. endosymbiosis
- c. formation of early organic molecules
- d. speciation due to natural selection

8. Some characteristics of a recently discovered organism are listed in the following table. Based on the given characteristics, the organism would be classified in which kingdom?

| Organism Characteristics             |
|--------------------------------------|
| Eukaryotic                           |
| Multicellular                        |
| Produces spores                      |
| Can reproduce sexually and asexually |
| Lacks chlorophyll                    |
| Non-motile                           |

- a. eubacteria
- b. fungi
- c. plantae
- d. protista

9. In order to determine how various organisms are related, scientists have organized them into classification groups or taxa. Which choice below lists the correct order of organism classification hierarchy, from most broad to most specific?

- a. species, family, genus, order, phylum, class, kingdom
- b. species, genus, family, order, class, phylum, kingdom
- c. kingdom, phylum, class, order, family, genus, species
- d. kingdom, class, phylum, order, genus, family, species

10. Which phylum of animals contains all of the animals with backbones?

- a. mulluska
- b. cnidaria
- c. echinodermata
- d. chordata

11. An organism is sessile, meaning that it is not free-moving. It has many pores that allow water to flow through. Specialized cells within the organism take in food and oxygen from the water and deposit waste back into the water. Which animal phylum does this organism belong to?

- a. mulluska
- b. cnidaria
- c. porifera
- d. echinodermata

12. Mosses do not have xylem or phloem in their body systems. They cannot circulate water well, and they lack true roots, stems, and leaves. What type of plant are mosses?

- a. nonvascular
- b. flowering
- c. vascular
- d. seed-producing

13. A scientist who studies organisms that inhabit the harsh climate of sulfurous hot springs most likely is studying members of which kingdom?

- a. archaeobacteria
- b. plantae
- c. animalia
- d. fungi

14. Into which kingdom would you classify a newly discovered unicellular, eukaryotic organism that moves using a flagellum and is a heterotroph?  
a. protista                      b. plantae                      c. animalia                      d. archaeobacteria
15. Which kingdom contains photosynthetic autotrophs?  
a. protista                      b. archaeobacteria                      c. plantae                      d. fungi
16. The fossil record shows that the forelimbs of humans, cats, dolphins, and bats have the same skeletal elements. These skeletal elements have evolved into different shapes and sizes based on function. What do the similarities between the skeletal structures of the four species most likely indicate about their evolutionary history?  
a. these four species all evolved from a common flying ancestor  
b. these four species are distantly related and all share a common ancestor  
c. these four species are not related and do not share a common ancestor  
d. these four species are all descended from the same parent organism
17. Separation of a population by a barrier, such as a river, results in which of the following?  
a. temporal isolation                      b. behavioral isolation                      c. geographic isolation                      d. relational isolation
18. Which of the following is an example of natural selection?  
a. owls sleep during the day, and doves sleep during the night  
b. a farmer breeds a certain cow that produces more milk than others  
c. a species of corn is genetically modified to produce a natural insecticide  
d. an aloe vera plant species possesses a trait for extra thick leaves survives a long drought in the desert, and an aloe vera species that has thinner leaves does not.
19. Natural selection operates on populations over many generations. Which of the following allows natural selection to occur?  
a. the old age of individuals that causes them to die  
b. the ability of populations to change quickly from one trait to another  
c. the unequal ability of individuals to survive and reproduce  
d. the desire and the advantage of a population to remain constant
20. A multicellular organism that has cells that are surrounded by a cell wall made of chitin would be found in which of the following kingdoms?  
a. animalia                      b. protista                      c. archaeobacteria                      d. fungi
21. Which of the following choices describes the main difference between plants that are considered gymnosperms and plants that are considered angiosperms?  
a. gymnosperms lack roots, stems, and leaves, while angiosperms have these structures  
b. gymnosperms have seeds in cones, while angiosperms have seeds in fruits  
c. gymnosperms are nonvascular, while angiosperms are vascular  
d. gymnosperms are monocots, while angiosperms are dicots
22. What is the more common term for platyhelminths?  
a. round worms                      b. flat worms                      c. segmented worms                      d. tapered worms
23. Which phylum of the animal kingdom contains the most complex of the animals?  
a. cnidaria                      b. chordata                      c. porifera                      d. arthropoda
24. The scientific name for an organism comes from which pair of Linnaeus's taxa?  
a. kingdom and phylum                      b. class and order                      c. family and genus                      d. genus and species
25. Which of the following choices describes a plant that has tube-like cells for the transport of water and nutrients, but uses spores for reproduction?  
a. nonvascular                      b. seedless                      c. gymnosperm                      d. dicot
26. Which scientist is credited with identifying and then publishing natural selection as the mechanism for evolution?  
a. Lamarck                      b. Malthus                      c. Hutton                      d. Darwin

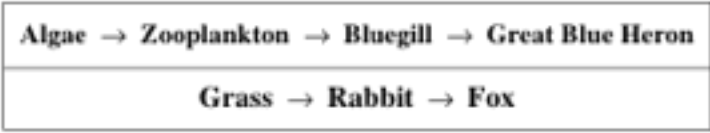
27. Which scientist is credited with first describing the earth as being much older than previously thought, setting the stage for evolution to occur over a long period of time?  
 a. Malthus                      b. Darwin                      c. Lamarck                      d. Hutton
28. According to endosymbiotic theory, an aerobic bacterium formed a symbiotic relationship with a larger cell. Over time, the bacterium began to function as the organelle that provided energy for the cell. What is the name of that organelle?  
 a. ribosome                      b. chloroplast                      c. mitochondria                      d. nucleus
29. *Acerodon celebensis* and *Acerodon humilis* are different fruit bats. What is the smallest classification these bats have in common?  
 a. family                      b. species                      c. genus                      d. order
30. After a drought, seeds on an island became harder to crack. Which of the following explains why the finch population may favor birds with larger, stronger beaks?  
 a. natural selection                      b. mutations                      c. extinction                      d. selective breeding
31. How are mitochondria and chloroplasts like bacteria cells?  
 a. they divide by meiosis                      c. they have the same organelles  
 b. they can make their own food                      d. they contain their own DNA
32. Why do scientists compare embryonic development of different organisms?  
 a. to determine if they could develop differently  
 b. to determine how long it takes for some organisms to become extinct  
 c. to determine if they may have a common ancestor  
 d. to determine why some organisms develop more quickly than other organisms
33. Which of the following would be examined by a scientist looking for physiological similarities?  
 a. nucleotide and amino acid sequences                      c. hair, fur, scales, or feather color  
 b. structural similarities                      d. embryonic development

**REVIEW QUESTIONS:** answer the following review questions to the best of your ability.

34. Mycorrhizae is a symbiotic relationship between plant roots and fungi. The fungi grow around the plant roots and increase the surface area for the absorption of water and other nutrients by the plant. In turn, the plant roots provide nutrients for the fungi. What relationship is mycorrhizae?  
 a. commensalism                      b. predation                      c. mutualism                      d. competition
35. The common brushtail possum is a marsupial native to Australia. This possum was introduced to New Zealand where it had no natural predators and had an abundant food supply. Which of these likely occurred a few years after the introduction of the possum to New Zealand?  
 a. the possum became extinct                      c. the possums evolved into a new species  
 b. the possum population grew to a large size                      d. the possums developed a shorter life span
36. Which biome contains plants that are adapted to areas that have infertile soils and receive constant amounts of precipitation?  
 a. tropical rainforest                      b. deciduous forest                      c. grassland                      d. taiga
37. Conservationists hope to restore populations of endangered black bears. Which strategy will result in long-term increase in bear populations?  
 a. bear feeding programs                      c. tracking bear movements  
 b. restoration of bear habitats                      d. increased hunting of bear predators
38. Which nesting behavior is expected in birds that are very plentiful in the grasslands?  
 a. nesting on the ground                      c. nesting in trees near water  
 b. nesting at the edges of lakes                      d. nesting in holes in dead trees

39. An area in Russia that was formerly covered by a glacier is now covered by a coniferous forest. The area has long, severe winters and only 50 to 100 days each year without frost. The area usually receives between 37 and 62 centimeters of precipitation per year. The rainfall in this area is similar to that of which type of biome?  
a. taiga                                      b. desert                                      c. tropical rainforest                                      d. temperate forest

40. Which of the following is at the top of an energy pyramid?  
a. herbivore                                      b. producer                                      c. decomposer                                      d. carnivore



41. Two food chains are shown at left. What role do the fox and the bluegill play in these communities?  
a. produces  
b. decomposers  
c. primary consumers  
d. secondary consumers

42. A lichen is a combination of fungus and algae that lives on the sides of trees, rocks, and other materials. The fungus provides the algae with water and minerals and the algae uses the water and minerals to make food for both organisms. What type of relationship does the lichen represent?  
a. predation                                      b. mutualism                                      c. parasitism                                      d. commensalism

43. The diagram represents feeding relationships in a Gulf ecosystem. Based on the food chain shown below, what organism is feeding on a primary consumer?



a. sand shrimp                                      b. summer flounder                                      c. bluefish                                      d. osprey