CHAPTER 14 – BSC 1005 (General Education Biology Lecture, Professor Chiappone) 
HOW BIOLOGICAL DIVERSITY EVOLVES (Simon et al. 2013, 5th edition)

SAMPLE QUESTIONS

1. Non-branching evolution __________.
   (a) results in speciation
   (b) often results in mass extinctions
   (c) increases biological diversity
   (d) is also called linear evolution
   (e) occurs only in plants

2. On what basis are populations assigned to the same biological species?
   (a) a very similar appearance
   (b) being able to interbreed and produce fertile offspring
   (c) relating to the environment in the same way
   (d) sharing a common ancestor
   (e) having 99% of their genes in common

3. The biological species concept cannot be applied to __________.
   (a) fungi that live on land
   (b) bacteria that only reproduce asexually
   (c) complex plants that have flowers
   (d) simple plants that reproduce sexually
   (e) animals that use asexual and sexual reproduction

4. A reproductive barrier that prevents species from mating is an example of __________.
   (a) a pre-zygotic barrier
   (b) reduced hybrid viability
   (c) zygote mortality
   (d) a post-zygotic barrier
   (e) reduced hybrid fertility

5. The type of reproductive barrier that occurs when two species mate but produce sterile hybrids is referred to as __________.
   (a) mechanical isolation
   (b) temporal isolation
   (c) habitat isolation
   (d) a post-zygotic barrier
   (e) behavioral isolation

6. Speciation requires __________.
   (a) periods of rapid evolutionary change
   (b) geographic isolation
   (c) long periods of time
   (d) a mass extinction so that new environmental opportunities will be available to the survivors
   (e) genetic isolation

7. Sympatric speciation specifically excludes __________.
   (a) behavioral isolation
   (b) mechanical isolation
(c) post-zygotic barriers
(d) geographic isolation
(e) temporal isolation

8. A pattern of evolution in which most change in appearance takes place during a relatively short period of time fits the _________ model of speciation.
   (a) punctuated gradualism
   (b) phyletic gradualism
   (c) punctuated equilibrium
   (d) homeostatic
   (e) gradualistic

9. Some fish have bony fins. If the body of water they are in dries out, these fins can be used to help the fish "walk" to another body of water. In this context, bony fins are an example of ________.
   (a) an exaptation
   (b) neoteny
   (c) an evolutionary novelty
   (d) punctuated evolution
   (e) paedomorphosis

10. Which of the following would be an example of paedomorphosis?
    (a) starfish regenerating severed limbs
    (b) rapid evolution in a small, isolated population
    (c) two species evolving a similar appearance
    (d) speciation as a result of a change in the number of sets of chromosomes
    (e) the ability to reproduce evolving in caterpillars

11. Uranium-235, with a half-life of 713,000,000 years, decays to lead-207. If a rock sample is determined to have one-quarter of the uranium-235 content it had when it formed, the age of the rock sample can be estimated to be approximately _________ years old.
    (a) 178 million
    (b) 713 million
    (c) 28.5 billion
    (d) 178 billion
    (e) 1.4 billion

12. What name is given to the single supercontinent that formed near the end of the Paleozoic?
    (a) Gondwanaland
    (b) Laurasia
    (c) Omniland
    (d) Pangaea
    (e) Gondwana

13. Dinosaurs (aside from the lineage that produced birds) were extinct by the end of the _________.
    (a) Cretaceous
    (b) Silurian
    (c) Eocene
    (d) Permian
    (e) Devonian

14. _________ is the study of the evolutionary relationships of organisms, past and present.
(a) Tautology
(b) Taxonomy
(c) Epistemology
(d) Systematics
(e) Biogeography

15. Which of the following is a genus and species name?
   (a) sapiens
   (b) Nitzschia jouseae
   (c) Sam
   (d) diatom
   (e) Rhizosolenia

16. Of the following taxonomic levels, species found within the same _________ are the most closely related.
   (a) family
   (b) phylum
   (c) class
   (d) order
   (e) domain

17. The wing of a penguin is _________ the flipper of a dolphin.
   (a) structurally identical to
   (b) superior to
   (c) divergent from
   (d) paedomorphically similar to
   (e) analogous to

18. Analogous structures are evidence of _________.
   (a) common ancestry
   (b) divergent evolution
   (c) stabilizing selection
   (d) paedomorphosis
   (e) convergent evolution

19. Cladistic analysis identifies clades based on _________.
   (a) the ability to interbreed and produce fertile offspring
   (b) analogous structures unique to each group
   (c) homologous structures unique to each group
   (d) last appearance in the fossil record
   (e) first appearance in the fossil record

20. Examine the two animals in the photographs in the following figure. Use all of the clues in this figure.
    These two organisms belong to _________.
    (a) the same species
    (b) the same genus
    (c) different families
    (d) different orders
    (e) different phyla
21. Examine the figure below. Cladistic analysis indicates that crocodiles are more closely related to ________ than to ________.
   (a) birds . . . alligators
   (b) snakes . . . birds
   (c) lizards . . . birds
   (d) turtles . . . birds
   (e) birds . . . lizards
Read the following scenario to answer the following questions.

In some zoos, rare crosses between a male lion and a female tiger have produced hybrid offspring called ligers. Male ligers are sterile but some female ligers are fertile. In the wild, lion and tiger ranges do not naturally overlap, making such a cross unlikely. Furthermore, the solitary behavior of tigers and the social organizations of lions create behavioral differences.

22. The natural differences in the ranges of wild tigers and lions is an example of __________.
   (a) a pre-zygotic barrier
   (b) a post-zygotic barrier
   (c) the bottleneck effect
   (d) the impact of mutations
   (e) sympatric speciation