Name _____

Evolution Review Guide: Chapter 16, 17, and 19

In order to answer these questions, use both your <u>lecture notes</u> and <u>textbook</u>. On a test **be able to apply** the concepts behind evolution to questions on the test not just memorize terminology. Don't forget to review the questions at the end of each section in the book.

 1. Define: a) Relative Dating: _____

         b) Radioactive Dating: _____

2. a) What is a half life and with which type of dating is it used?

   b) What is an index fossil and with which type of dating is it used?

3. Radioactive element X has a half-life of 30 days. A rock sample contains 4 grams of element X when it forms. SHOW WORK
         a. How many half-lives will have elapsed in 90 days?

         b. How much of the original amount of X will be unchanged after 90 days? (In other words, how much will be left of the original element?)

4. The mass of cobalt-60 in a sample is found to have decreased from 10 grams to 2.5 grams in a period of 10.6 years. From this information, calculate the half-life of cobalt-60.

5. Describe how the following scientists/economists influenced the theory of evolution:

        a. Lyell:

        b. Hutton:

        c. Malthus

6. Explain the difference between evolution and natural selection.

7. Explain what Lamarck meant when he used the phrases "use and disuse" and "acquired traits are inherited". What were some criticisms to these phrases.


8. Using Lamarck's theory on acquired traits, explain how zebras came to have stripes.

9. Using Darwin's theory on acquired traits, explain how zebras came to have stripes.

10. **<u>Describe</u>** 7 examples of major pieces of evidence for evolution

11. List an example of artificial selection.

12. What is a vestigial structure? Give an example.

13. What are three ways that a new species could form (the isolation mechanisms)?

14. A) Define Genetic Drift:_____

    B) Define founder's effect: _____

15. Define allele frequency and explain how it can be used to see evolution in a population.

16. How is a homologous structure different than an analogous structure? Give an example of each.

17. What is the difference between a variation and an adaptation? Give examples of each.

18. What is fitness? How does it tie into evolution?

19. What are 4 <u>mechanisms</u> that drive evolution?

20. Fill in the table below about single-gene traits and polygenic traits using the following phrases: controlled by one gene, may have many phenotypes that are not clearly distinct from one another, controlled by genes, may only have two or three distinct phenotypes, controlled by two or more genes.

Single-gene Traits Only	Both	Polygenic Traits Only

21. a. In the space below, draw the before/after graphs associated with each of the following **modes** of natural selection and make sure to label the axes trait and number of individuals:
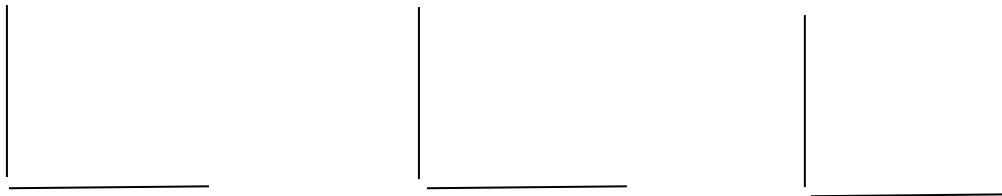
b. Describe when these modes of selection occur.

22. What is speciation? How does it occur?

23. Compare convergent and divergent evolution

24. Describe the difference between gradualism and punctuated equilibrium.

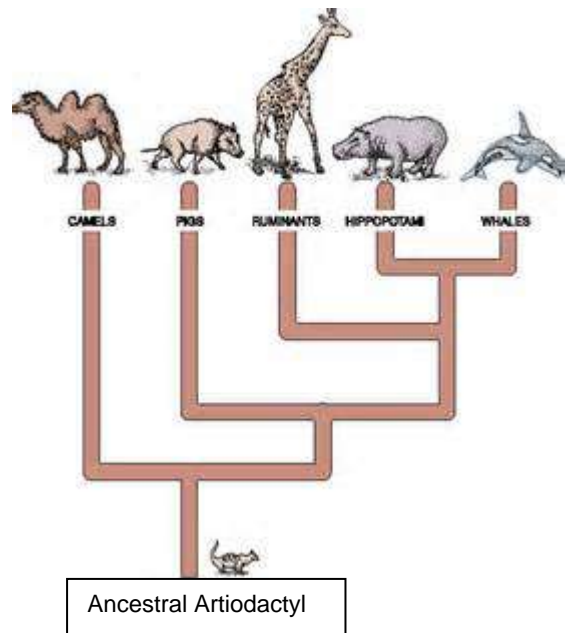**(CONTINUE ON BACK)**

25. What is a cladogram?

26. Using the cladogram to the right, answer the following questions

a. What common ancestor does the camel and the pig share?

b. The most closely related species are?

c. Which species have the most DNA in common?

d. Which species will have the most different DNA from each other?

Ancestral Artiodactyl

27. Examine the data table below, which shows the number of differences in the amino acid sequence of a protein called **cytochrome c** between fruit flies and other organisms.

Species	# of amino acid differences from fruit fly
Dogfish shark	26
Pigeon	25
Screwworm fly	2
Silkworm	15
Tobacco hornworm	14
Wheat	47

a. As you move from left to right in this cladogram, what happens to the number of difference amino acid sequences?

b. Which species is most closely related to the fruit fly?

My child has studied this study guide for at least 20 minutes (2 bonus points)

_____
(Parent/guardian signature)