

## Quiz #4

### Ch. 4 – Modern Evolutionary Theory

1. T/F Evolution by natural selection works directly on individuals, transforming populations.
2. T/F A genotypic frequency refers to the fraction of a population that carries a particular genotype.
3. T/F Genotypic frequencies tend to remain steady over time.
4. T/F Mutation occurs randomly.
5. Mutations are:
  - a. the source of new genetic variation
  - b. always harmful
  - c. always more beneficial than previous forms of the gene
  - d. produced only when there is too much radiation or chemical pollutants
6. The process of stabilizing selection results in
  - a. the slow transformation of a population
  - b. the rapid transformation of a population
  - c. keeping a population uniform
  - d. the production of new variations in a population
7. T/F The adaptive fitness of a mutation is based on the environment in which the species lives.
6. Genetic equilibrium (re: Hardy Weinberg equilibrium) is maintained in a gene pool under ideal conditions. This equilibrium can be disturbed by: (select those that apply)
  - a. nonrandom mating
  - b. mutation
  - c. genetic drift
  - d. variations in fertility
  - e. natural selection
7. T/F Mendelian genetics is incompatible with Darwin's theory of natural selection.
8. What does the Modern Synthesis refer to?
9. T/F Sexual reproduction enables the blending of genes.
10. What is mate guarding? How might it increase a male's reproductive success?
11. Under what conditions might mate guarding not be the most effective reproductive strategy for males?

12. T/F Mating strategies can be inherited.
13. The \_\_\_\_\_ a population, the greater the potential effect of genetic drift on gene frequencies.  
a. larger b. more diverse c. more migratory d. smaller
14. T/F A small group of individuals which colonize a new area mostly likely will not represent a random sample of alleles of the populations from which they came.
15. T/F Gene flow refers to exchange of genes among populations through interbreeding.
16. T/F Very limited amounts of gene flow can eliminate the harmful effects of inbreeding.
17. Which of the following is an example of genetic bottleneck?  
a. a small population becomes isolated from its parent gene pool  
b. a large diverse gene pool undergoes a rapid decrease in size and then increases again  
c. a large diverse population is separated into two distinct gene pools  
d. all of these
17. T/F A genetic bottleneck is often associated with a founder effect.
18. The ultimate source of biological variation is:  
a. mutation b. crossing-over c. differential fertility d. recombination
19. The difference in size, shape, or color between the sexes within a species is referred to as  
a. sexual selection b. genetic bottleneck c. reproductive variance d. sexual dimorphism
20. How might female choice lead to the evolution of males with particular traits?
21. How might we explain the abundant and beautiful feathers on the peacock?
22. Features that are *homologous* are similar due to  
a. convergent evolution b. parallel evolution c. similar patterns of use d. shared evolutionary history
23. Features that are *analogous* are similar due to  
a. convergent evolution b. parallel evolution c. similar patterns of use d. shared evolutionary history
24. Parallel evolution results in  
a. analogous traits b. derived characters c. homologies d. sexual dimorphism

25. *T/F Ancestral characters* are traits shared between species due to a shared evolutionary history
26. *T/F* A branching diagram showing evolved relationships among members of a lineage is called a cladogram
27. A *clade* contains species
- linked by a set of unique traits
  - that display no apparent evolutionary relationship
  - separated by distinct analogous traits
  - that have gone extinct
28. What is an example of how culture affects genetics?
29. Consanguineous mating within a population would tend to:
- decrease the homogeneity of that population
  - increase the homogeneity of that population
  - increase the heterogeneity of that population
  - have no effect on the gene pool
30. Homozygosity:
- increases when people of similar rather than diverse ancestry mate
  - increases when people of diverse ancestry mate
  - is unaffected by mating patterns
  - is not permitted in the United States
31. Endogamy means:
- having very similar genotypes
  - heat transfer from similar phenotypes
  - picking a mate from within the population
  - picking a mate from outside the population
  - choosing a mate from another species
32. *T/F* Evolution takes place within populations.
33. *T/F* Macroevolution is the study of large-scale evolutionary change.
34. The ability to adapt to changing environments is enhanced by:
- specialization
  - genetic variability
  - dependence upon innate behavioral patterns
  - all of these
35. Some people claim that evolution has stopped, what do you think?
36. *T/F* According to the *Biological Species Concept*, two groups of creatures are sometimes considered separate species even if they are capable of creating fertile offspring.
37. *T/F* Species can be real biological categories.

38. What is an example of a reproductive isolating mechanism?
39. Which of the following represents a pre-mating isolation mechanism?  
a. zygote inviability b. sperm-egg incompatibility c. offspring sterility  
d. mechanical incompatibility
40. T/F Geographic isolation is important in the process of speciation.
41. Why is speciation difficult to study empirically?
42. Anagenesis is said to have occurred when  
a. one species evolves into another over time b. a species coexists with its mother species  
c. geographic separation is responsible for speciation d. populations share genetic material
43. T/F Macromutations are usually deleterious
44. T/F Speciation can be given a head start by macromutations
43. T/F When two species are allopatric it means they must live in mutually exclusive areas in order to survive.
44. T/F Adaptations are phenotypic traits that increase an organism's reproductive success
45. T/F Preadaptation refers to the potential to adapt to a new niche
46. T/F An adaptive radiation refers to the development of anatomical/physiological adaptations to compete successfully in a variety of niches.
47. T/F The evolution of mammals after the dinosaurs became extinct is an example of an adaptive radiation.
48. The most important and prevalent type of biological evolution is  
a. macroevolution b. punctuated equilibrium c. saltation d. gradualism
49. The theory that species persist for long periods and then undergo rapid spurts of evolutionary change is:  
a. darwinian gradualism b. punctuated equilibrium c. parallel evolution  
d. microevolution e. convergent evolution

50. Macroevolution and punctuated equilibrium help explain
- a. the abundance of intermediate forms in the fossil record
  - b. gradualism
  - c. gaps in the fossil record
  - d. the interrelationships among an organism's characteristics
51. The fact that several marsupial species share many structural similarities with placental mammals is an example of
- a. speciation
  - b. adaptive radiation
  - c. convergent evolution
  - d. geographic isolation
  - e. founder effect
52. What is the difference between a nocturnal and a diurnal animal?
53. Using a molecular clock which ape species is most closely related to humans?
54. What genus are humans classified under?
55. T/F Chimpanzees, humans and bonobos share the same genus.