Evolution Exam

True/False
Indicate whether the statement is true or false.

____  1. When food is scarce, the number of different beak shapes of finches increases.

____  2. Species that have evolved from a common ancestor should have certain characteristics in common.

____  3. Darwin observed that the plants and animals of the Galápagos Islands were the same as those on islands off the coast of Africa with similar environments.

____  4. Natural selection causes allele frequencies within populations to remain the same.

____  5. The environment dictates only the direction and extent of evolution.

____  6. The book Principles of Geology by Charles Lyell described how changes in land formations can cause species to evolve.

____  7. In his Essay on the Principle of Population, Malthus said humans were the only population that could continue to grow in size indefinitely.

____  8. Within populations, divergence leads to speciation.

____  9. The two major ideas that Darwin presented in The Origin of the Species were that evolution occurred and that natural selection was its mechanism.

____  10. The inheritance of acquired characteristics was one mechanism of evolution supported by Darwin.

____  11. The environment selects which organisms will survive and reproduce by presenting challenges that only individuals with particular traits can meet.

____  12. The theory of evolution states that species change over time.

____  13. Natural selection can cause the spread of an advantageous adaptation throughout a population over time.

____  14. Evidence for evolution occurs only in the fossil record.

____  15. The fossil record suggests that species have become less complex over time.
Multiple Choice
Identify the choice that best completes the statement or answers the question.

___ 16. According to Darwin, evolution occurs
   a. by chance.
   b. during half-life periods of 5,730 years.
   c. because of natural selection.
   d. rapidly.

___ 17. Under which of the following conditions would you expect rapid evolution of species to occur?
   a. among populations in similar habitats
   b. in large, randomly breeding populations
   c. in populations with few reproductive isolating mechanisms
   d. among populations exposed to climatic and other environmental changes
   e. under all of the above conditions

___ 18. Natural selection is the process by which
   a. the age of selected fossils is calculated.
   b. organisms with traits well suited to their environment survive and reproduce at a greater rate than less well-adapted organisms in the same environment.
   c. acquired traits are passed on from one generation to the next.
   d. All of the above

___ 19. The theory of evolution predicts that
   a. closely related species will show similarities in nucleotide sequences.
   b. if species have changed over time, their genes should have changed.
   c. closely related species will show similarities in amino acid sequences.
   d. All of the above

___ 20. Behavioral isolating mechanisms may occur when two species have different
   a. sized and shaped copulatory organs
   b. courtship displays
   c. times of the day that they are sexually active
   d. habitat ranges
   e. chemical compatibilities of their gametes

___ 21. When Darwin published his theory of evolution, he included all of the following ideas except
   a. the idea that species change slowly over time.
   b. the idea that some organisms become less suited to their environment than others.
   c. Mendel’s ideas about genetics.
   d. the idea that some organisms reproduce at a greater rate than others.
22. Two species of wild lettuce grow in the same areas, but one flowers in early spring and the other flowers in summer. This is an example of a
   a. postzygotic isolating mechanism
   b. geographical isolating mechanism
   c. behavioral isolating mechanism
   d. mechanical isolating mechanism
   e. temporal isolating mechanism

23. Refer to the illustration above. The similarity of these structures suggests that the organisms
   a. have a common ancestor.
   b. all grow at different rates.
   c. evolved slowly.
   d. live for a long time.

24. Refer to the illustration above. The bones labeled u are known as
   a. vestigial structures.
   b. sequential structures.
   c. homologous structures.
   d. fossil structures.

25. Refer to the illustration above. An analysis of DNA from these organisms would indicate that
   a. they have identical DNA.
   b. they all have pharyngeal pouches.
   c. their nucleotide sequences show many similarities.
   d. they all have the same number of chromosomes.

26. Which of the following is NOT one of the basic assumptions needed in order to explain natural selection?
   a. Within a population, there are variations of a trait.
   b. Within a population, more offspring are produced than can survive.
   c. Within a population, species maintain homeostasis.
   d. Within a population, individuals with a trait that is beneficial in their environment will reproduce and pass on their genes.

27. The process by which a species becomes better suited to its environment is known as
   a. accommodation.
   b. variation.
   c. adaptation.
   d. selection.
28. The sperm of species A dies when it comes in contact with the female reproductive tract of species B. This is an example of
   a. sexual selection
   b. a prezygotic isolating mechanism
   c. a postzygotic isolating mechanism
   d. gradualism
   e. microevolution

29. Natural selection could not occur without
   a. genetic variation in species.
   b. environmental changes.
   c. competition for unlimited resources.
   d. gradual warming of Earth.

30. Homologous structures in organisms suggest that the organisms
   a. have a common ancestor.
   b. must have lived at different times.
   c. have a skeletal structure.
   d. are now extinct.

31. Which of the following is NOT an example of convergent evolution?
   a. Darwin’s finches and mocking birds
   b. sharks and whales
   c. dolphins and fish

32. Which of the following is an example of anatomical evidence for evolution?
   a. The DNA of two related species.
   b. Amber preserved or frozen fossils
   c. Vestigial structures
   d. All of the above

The diagrams below represent bones in the limbs of fossil horses and modern horses.

33. Refer to the illustration above. The fossils indicate that horse evolution probably has taken place
   a. rapidly.
   b. in only one place on Earth.
   c. gradually.
   d. five times by the process of punctuated equilibrium.
34. Changes in gene frequencies within a population are called
   a. gene flow  d. microevolution
   b. macroevolution  e. natural selection
   c. polymorphism

35. Darwin used which example of artificial selection in chapter 1 of the origin of species?
   a. dogs  c. pigeons
   b. finches  d. rats

36. struggle for survival : competition ::
   a. time : environment  c. trait : time
   b. survival of the fittest : best traits  d. environment : traits

37. Darwin thought that the plants and animals of the Galápagos Islands were similar to those of the nearby coast of South America because
   a. their ancestors had migrated from South America to the Galápagos Islands.
   b. other scientists in South America had written about similar species.
   c. the island organisms had the same nucleotide sequences in their DNA as the mainland organisms.
   d. he found fossils, proving that the animals and plants had common ancestors.

38. Mutations act on ____________, natural selection acts on ____________.
   a. alleles, populations  c. DNA, gene pools
   b. macroevolution, microevolution  d. microevolution, macroevolution

39. Beak shape in finches is affected by
   a. the number of predators in the area.  c. the color of the finch.
   b. the size of the finch.  d. the availability of food.

40. Darwin conducted much of his research on
   a. the Samoan Islands.  c. the Hawaiian Islands.
   b. Manhattan Island.  d. the Galápagos Islands.

41. The major idea that Darwin presented in his book *The Origin of Species* was that
   a. species changed over time and never competed with each other.
   b. animals changed, but plants remained the same.
   c. elephants and bacteria changed constantly.
   d. species changed over time by natural selection.

42. Which of the following is not a prezygotic isolating mechanism?
   a. prevention of gamete fusion
   b. temporal isolation
   c. production of sterile hybrids
   d. geographical isolation
   e. all of the above are prezygotic isolating mechanisms
43. Organisms well suited to their environment
   a. reproduce at a greater rate than those less suited to the same environment.
   b. are always larger than organisms less suited to that environment.
   c. always live longer than organisms less suited to that environment.
   d. need less food than organisms less suited to that environment.

Matching

a. Natural Selection          d. Nonrandom Mating
b. Gene Flow                e. Genetic Drift
c. Mutation

44. movement of allele between different populations

45. A bottleneck can cause this.

46. Same as sexual selection.

47. Only mechanism capable of producing adaptation.


a. Macroevolution          d. Genetic Drift
b. Microevolution            e. Gene Flow
c. Sexual Selection

49. DNA evolution

50. Directional Selection leads to

51. Structural Adaptations

52. immigration

53. emigration

54. males display of dominance.

a. allopatric speciation       d. divergent evolution
b. sympatric speciation          e. Red Queen hypothesis
c. convergent evolution

55. two species evolved by geographic isolation

56. insect wings vs. bat wings

57. Evolove or DIE.

58. two species have evolved in the same area.
59. result of allopatric speciation

a. Stabilizing Selection  
b. Disruptive (diversifying) selection  
c. Directional Selection

60. Selection against the mean

61. Selection against an extreme
MC - Part 2

62. - Which process has the greatest effect in determining which members of a population are most likely to survive until reproductive age?

A. Speciation
B. Natural selection
C. Meiosis
D. Hybridization

63. - What is the primary cause of the “struggle for survival” between individuals of a species?

A. The innate tendency of organisms in populations to compete against each other
B. The need for organisms to fight against natural disasters and diseases
C. The genetic variability among organisms of different species
D. The tendency for populations to produce more offspring than can be supported
Evolution Exam
Answer Section

TRUE/FALSE

1. ANS: T  PTS: 1  DIF: I  OBJ: 13.3.3
2. ANS: T  PTS: 1  DIF: I  OBJ: 13.1.1
3. ANS: F  PTS: 1  DIF: I  OBJ: 13.1.1
4. ANS: F  PTS: 1  DIF: I  OBJ: 13.1.1
5. ANS: T  PTS: 1  DIF: I  OBJ: 13.3.1
6. ANS: F  PTS: 1  DIF: I  OBJ: 13.1.1
7. ANS: F  PTS: 1  DIF: I  OBJ: 13.1.1
8. ANS: T  PTS: 1  DIF: I  OBJ: 13.3.4
9. ANS: T  PTS: 1  DIF: I  OBJ: 13.1.1
10. ANS: F  PTS: 1  DIF: I  OBJ: 13.1.2
11. ANS: T  PTS: 1  DIF: I  OBJ: 13.3.2
13. ANS: T  PTS: 1  DIF: I  OBJ: 13.1.2
14. ANS: F  PTS: 1  DIF: I  OBJ: 13.2.2
15. ANS: F  PTS: 1  DIF: I  OBJ: 13.2.1

MULTIPLE CHOICE

17. ANS: D  PTS: 1
18. ANS: B  PTS: 1  DIF: II  OBJ: 13.1.2
19. ANS: D  PTS: 1  DIF: II  OBJ: 13.2.2
20. ANS: B  PTS: 1
22. ANS: E  PTS: 1
23. ANS: A  PTS: 1  DIF: II  OBJ: 13.2.3
24. ANS: C  PTS: 1  DIF: II  OBJ: 13.2.3
25. ANS: C  PTS: 1  DIF: II  OBJ: 13.2.2
26. ANS: C  PTS: 1
27. ANS: C  PTS: 1  DIF: I  OBJ: 13.1.3
28. ANS: B  PTS: 1
29. ANS: A  PTS: 1  DIF: I  OBJ: 13.1.2
30. ANS: A  PTS: 1  DIF: I  OBJ: 13.2.3
31. ANS: A  PTS: 1
32. ANS: C  PTS: 1
33. ANS: C  PTS: 1  DIF: II  OBJ: 13.2.1
34. ANS: D  PTS: 1
35. ANS: C  PTS: 1
36. ANS: B  PTS: 1  DIF: III  OBJ: 13.3.1
37. ANS: A  PTS: 1  DIF: II  OBJ: 13.1.1
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**MATCHING**

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**SHORT ANSWER**

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