1. Evolutionary theory is based on a set of
* a. testable hypotheses
  b. scientists' opinions about different species
  c. assumptions about when life began
  d. observations of the natural world

2. The claim that "living species can change over time and give rise to new kinds of organisms, with the result that all organisms ultimately share a common ancestry" is central to which theory?
  a. Genetic transformational theory
* b. Evolutionary theory
  c. Intelligent design
  d. Prehistoric positional theory

3. In your text, evolution is defined as
  a. descent with modification
  b. natural selection plus random access
* c. the process of change over time
  d. material evidence

4. That view that every "natural kind" of living thing is characterized by an unchanging core of features and separated from all other natural kinds by a sharp break is
* a. essentialism
  b. catastrophism
  c. uniformitarianism
  d. natural selection

5. A single hierarchy of all organisms, each differing slightly from the ones above it and below it was known as
* a. the Great Chain of Being
  b. binomial nomenclature
  c. essentialism
  d. catastrophism

6. A system of biological classification is called a
  a. great chain of being
  b. genus
* c. taxonomy
  d. plenitude

7. The "father of modern biological classification" is the title often given to
  a. Ernst Mayr
* b. Carolus Linnaeus
  c. Charles Darwin
  d. Lamarck

8. The level of the Linnaean taxonomy in which different species are grouped together on the basis of their similarities to one another is called a
  a. category
  b. class
  c. taxon

* d. genus

9. For modern biologists, a species is defined as
* a. a reproductive community that occupies a specific niche
   b. a set of related individuals
   c. a general category of organisms that closely resemble one another
   d. the organisms that live in a specific niche

10. The notion that natural disasters, such as floods, are responsible for the extinction of species, which are then replaced by new species is known as
   a. religion
   b. essentialism
   c. gradualism
* d. catastrophism

11. Who among the following asserted that, over time, some species had been suddenly wiped out and replaced by new species from somewhere else?
   a. Margaret Bouvier
   b. Georges Duvivier
* c. Georges Cuvier
   d. Charles Lyell

12. The notion that an understanding of current processes can be used to reconstruct the past history of the earth is known as
* a. uniformitarianism
   b. catastrophism
   c. gradualism
   d. essentialism

13. Lamarkian evolution is also known as
   a. variational evolution
* b. transformational evolution
   c. evolution by descent
   d. notional selection

14. The argument that each individual member of a species transforms itself to meet the challenges of a changed environment through the laws of use and disuse and inheritance of acquired characters was made primarily by
* a. Lamarck
   b. Darwin
   c. Cuvier
   d. Lyell

15. The claim that similar living species must all have had a common ancestor or origin was made by
   a. Lamarck
* b. Darwin
   c. Cuvier
   d. Lyell

16. The idea of the inheritance of acquired characters holds that

* a. the physical result of the use or disuse of organs could be passed from one generation to the next
   b. the environment does not allow for certain accidentally acquired characteristics to be passed from one generation to the next
   c. as a species adapts to an environment, changes in gene frequency are passed to the next generation
   d. only those characteristics that are acquired may be inherited

17. The panda's elongated wrist bone or "thumb" would be explained by Lamarck's theory in which of the following ways?
* a. Some pandas acquired "thumbs" through strenuous activity and then produced offspring with the same characteristic.
   b. Some pandas had "thumbs" of different lengths, and in a new environment, those with longer "thumbs" were better able to survive and produce offspring.
   c. Some pandas acquired "thumbs" through strenuous activity and were better able to survive.
   d. Some pandas had longer "thumbs" and were able to produce offspring.

18. The panda's elongated wrist bone or "thumb" would be explained by Darwin's theory in which of the following ways?
   a. Some pandas acquired "thumbs" through strenuous activity and then produced offspring with the same characteristic.
* b. Some pandas had "thumbs" of different lengths, and in a new environment, those with longer "thumbs" were better able to survive and produce offspring.
   c. Some pandas acquired "thumbs" through strenuous activity and were better able to survive.
   d. Some pandas had longer "thumbs" and were able to produce offspring.

19. The theory of common ancestry holds that
   a. no species is ranked higher than any other in the taxonomy
* b. similar species are descended from a common ancestor
   c. similar species are able to interbreed
   d. all species reproduce in a similar ("common") way

20. Darwin's innovation in defining the species was to emphasize
   a. what members of a species have in common
   b. the connections of species to other species
* c. how individual members of a species differ
   d. the survival potential of the species

21. Which of the following is NOT an element of Darwin's theory of evolution by natural selection?
* a. crossing-over
   b. natural selection
   c. struggle for existence
   d. variation

22. Darwin's theory that the "fitter" survive and reproduce more offspring, who then inherit the traits that made their parents "fitter" is called
   a. mixed reproduction
   b. survival of the fittest

c. heredity
* d. natural selection

23. The measure of an organism's ability to compete in the struggle for existence is known as
* a. fitness
b. adaptation
c. the phenotype
d. aptation

24. In Darwinian terms, who are the fit?
a. The most powerful
b. Those who survive
* c. Those who reproduce and replace themselves
d. Those who cooperate with others

25. The shaping of any useful feature of an organism, regardless of its origin is referred to as
* a. aptation
b. adaptation
c. exaptation
d. reconciliation

26. The shaping of useful features of an organism by natural selection for the function they now perform is
a. aptation
* b. adaptation
c. exaptation
d. reconciliation

27. The shaping of a useful feature of an organism by natural selection to perform one function and the later reshaping of it by different pressures to perform a new function is
a. aptation
b. adaptation
* c. exaptation
d. reconciliation

28. The theory of heredity which suggests that an organism's physical traits are passed on from one generation to the next in the form of multiple, distinct particles is called
a. monogenesis
b. natural selection
c. transmission theory
* d. pangenesis

29. When peas with red flowers are crossed with peas with white flowers and then the resulting plants are AGAIN crossed, what will be the ratio of pea plants with red flowers to plants with white flowers in this SECOND generation?
a. 1:4
* b. 1:3
c. 1:2
d. 1:1

30. Mendelian inheritance is

a. blending, multiple-particle
b. blending, single-particle
c. nonblending, multi-particle
* d. nonblending, single-particle

31. In Mendelian genetics, those genetic characteristics that are expressed in an organism are said to be
* a. dominant
b. genetic
c. homozygous
d. recessive

32. In Mendelian genetics, genetic characteristics that are not expressed in an organism are said to be
a. dominant
b. genetic
c. homozygous
* d. recessive

33. In modern terms, Mendel's principle of segregation holds that
a. plants are able to pass genetic information from one generation to the other without sexual reproduction
b. there are two chromosomes for each physical trait
* c. an individual receives one chromosome of each pair of chromosomes from each parent
d. the genes controlling related traits are next to each other on chromosomes

34. In modern terms, Mendel's principle of independent assortment holds that
a. each pair of chromosomes separates independently of every other pair of chromosomes when sex cells are formed
b. chromosomes sort themselves according to a genetically inherited sequence that is independent of any other pattern
c. the set of chromosomes that come together in any individual is random
* d. both a and c

35. A fertilized egg that has received a different form of a specific gene from each parent is called
a. homozygous
* b. heterozygous
c. allele-identical
d. chromosomal

36. Homozygous:heterozygous::
* a. same:different
b. fertilized:unfertilized
c. genetics:heredity
d. genes:alleles

37. A person who is homozygous for the X chromosome is
a. male
* b. female
c. gendered
d. There is not enough information to say.

38. A person who is heterozygous for the X and Y chromosomes is
* a. male
  b. female
  c. gendered
  d. There is not enough information to say.

39. In genetics, the phenomenon known as crossing over occurs when
  a. two chromosomes are passed on together
* b. part of a chromosome breaks off and reattaches itself to a different chromosome
  c. two genes near each other on the same chromosome have an effect on a trait
  d. there is discontinuous variation

40. The principle of Mendelian inheritance in which an individual gets one gene for each trait from each parent is the principle of
  a. inheritance
  b. genetics
* c. segregation
  d. independent assortment

41. The principal of Mendelian inheritance in which each pair of chromosomes separates independently of every other pair when egg and sperm are formed is the principle of
  a. inheritance
  b. genetics
  c. segregation
* d. independent assortment

42. A fertilized egg that receives the same allele from each parent for a particular trait is referred to as being
* a. homozygous
  b. heterozygous
  c. identical
  d. chromosomal

43. A fertilized egg that receives a different allele from each parent for the same trait is referred to as being
  a. homozygous
* b. heterozygous
  c. identical
  d. chromosomal

44. All the different forms that a particular gene might take are known as
* a. alleles
  b. chromosomes
  c. particles
  d. variants

45. The form of cell division in which each newly formed daughter cell takes one full set of paired chromosomes is called
  a. meiosis
* b. mitosis

c. natural selection
d. sexual transmission

46. Sex cells make copies of themselves through a process in which daughter cells retain only a single set of chromosomes. This process is called
* a. meiosis
b. mitosis
c. natural selection
d. sexual transmission

47. In the ABO series of human blood types, people have only one kind of blood type, either A, B, AB, or O. This illustrates what kind of variation?
a. Continuous
b. Contingent
* c. Discontinuous
d. Genetic

48. Polygeny:pleiotropy::
a. homozygous:heterozygous
b. one:many
* c. many and one:one and many
d. blood type:skin color

49. The situation in which two or more genes are responsible for producing a single trait is called
a. linkage
* b. polygeny
c. polyzygous
d. pleiotropy

50. The situation in which one gene may affect more than one trait is called
a. linkage
b. polygeny
c. polyzygous
* d. pleiotropy

51. That the allele that gives human red blood cells increased resistance to malarial parasites also reduces the amount of oxygen those cells can carry demonstrates
a. genotype
b. phenotype
c. polygeny
* d. pleiotropy

52. Natural selection acts on
a. mutations
b. the needs of a species
* c. randomly produced variation
d. the sex cells

53. Chromosomes are made up of strands of
* a. deoxyribonucleic acid
b. guanine

c. cytosine
d. ribonucleic acid

54. The biochemical structure for transmitting genetic information regarding the construction and development of a particular organism is
a. adenine
* b. DNA
c. MFT
d. RNA

55. Mutations that neither help nor harm an organism are called
a. allele mutations
* b. neutral mutations
c. regulatory mutations
d. value-free mutations

56. The sum total of all the genetic information about an organism, carried on the chromosomes in the cell nucleus is called the
a. genotype
* b. genome
c. phenotype
d. locus

57. The realization of a _____is called the _____.
* a. genotype; phenotype
b. phenotype; genotype
c. phenotype; norm of reaction
d. genotype; norm of reaction

58. The genetic information about particular biological traits encoded in an organism's DNA is called the
* a. genotype
b. infrabar
c. phenotype
d. ultrabar

59. The observable, measurable outward characteristics of an organism are called the
a. genotype
b. infrabar
* c. phenotype
d. ultrabar

60. _____ genotypes may produce _____ phenotypes.
a. Different; different
b. Different; the same
c. The same; different
* d. all of the above

61. At 6,000 calories a day, a person with genotype X will weigh 285 lbs with much energy and high cholesterol levels. At 3,500 calories a day, the person will weigh 200 lbs with much

energy and slightly elevated cholesterol levels. At 1,800 calories a day, the person will weigh 175 lbs with little energy and low cholesterol levels. These are examples of that genotype's
a. adaptive capacities
b. environment
* c. norm of reaction
d. This has nothing to do with the genotype.

62. The way in which genotype and environment interact to produce a phenotype is measured by the
a. overall size of the organism
b. phenotypic index
* c. norm of reaction
d. principle of independent assortment

63. When an organism actively perturbs the environment in ways that modify the selection pressures experienced by subsequent generations of organisms, it is said to be engaged in
a. genetic drift
b. gene flow
c. natural selection
* d. niche construction

64. The way people struggle, often against great odds, to exercise some control over their lives is known as
* a. human agency
b. natural selection
c. niche construction
d. race memory

65. What is the likely future of a given species?
* a. extinction
b. transformation via evolution into another species
c. stability
d. It depends on its genetic makeup.

Essay Questions

66. Discuss the material evidence for evolution.

67. Compare and contrast the positions of catastrophism and uniformitarianism.

68. How would a scholar following the work of Lamarck explain the evolution of the elephant's trunk? How would a Darwinian explain it?

69. What are the key elements of Darwin's approach to evolution? Why are they important?

70. What is the significance of variation in evolution by natural selection? Be sure to illustrate your answer with specific examples.

71. What difference does it make that Darwinian evolution by natural selection is a phenomenon that affects populations of organisms?

72. Is there such a thing as “absolute fitness”? Why or why not?

73. What are some of the ways in which sexual reproduction maintains or increases variation? Why is this significant?

74. What are polygeny and pleiotropy? Why are they important?

75. What is the significance for human beings of the facts that different genotypes can produce the same phenotypes in some environments and that the same genotype can produce different phenotypes in different environments?