Biology Final Exam

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- 1. Biology is the study of
 - a. minerals.
 - b. life.

- c. the weather.
- d. energy.

- 2. All organisms possess DNA. DNA
 - a. creates energy for cells.
 - b. allows sensitivity to environmental stimuli.
 - c. contains information for growth and development.
 - d. captures energy from the sun.
- 3. Instructions for traits that are passed from parents to offspring are known as
 - a. a species plan. c. genes.
 - b. organ codes. d. natural selections.
- 4. Homeostasis means
 - a. a change over long periods of time.
 - b. keeping things the same.
 - c. rapid change.
 - d. the same thing as evolution.
- 5. Ecology
 - a. refers to change in species over time.
 - b. refers to a delicate internal balance within organisms.
 - c. is inconsistent with evolution.
 - d. is the study of communities or organisms in relation to their environment.
- 6. The smallest units that can carry on all the functions of life are called
 - a. molecules. c. organelles.
 - b. cells. d. species.
- 7. Living things
 - a. need energy for life processes.
 - b. have the ability to reproduce.
 - c. are composed of cells.
 - d. All of the above
- 8. All organisms are composed of
 - a. diatoms.
 - b. cellulose.

- c. cells.
- d. None of the above
- 9. All living things maintain a balance within their cells and the environment through the process of
 - a. growth.

- c. homeostasis.
- b. development. d. evo
- d. evolution.

- 10. Which of the following is a characteristic of all living things?
 - a. movement

- c. development
- b. photosynthesis d. cellular organization
- 11. A scientist noticed that in acidic pond water some salamanders developed with curved spines. This was a(n)
 - a. hypothesis. c. observation.
 - b. theory.

- d. control.
- 12. Which example of scientific methodology is *incorrect*?
 - a. observation—a number of people in a certain place dying of a disease outbreak
 - b. measurement—a record of the number of people with symptoms of a disease and the number of people who had died from the disease
 - analysis of data—comparison of the effects of mixing monkey cells with virus-containing c. blood in test tubes and the effects of mixing liquid from these test tubes with fresh monkey cells
 - d. inference making—identification of the Ebola virus as the cause of a disease by taking electron micrographs of substances found in the blood of persons affected with the disease
- 13. Scientific hypotheses are most often tested by the process of
 - a. communicating. c. experimenting.
 - b. inferring. d. analyzing data.
- 14. A hypothesis is
 - a. a definite answer to a given problem.
 - b. a testable possible explanation of an observation.
 - c. a proven statement.
 - d. a concluding statement.
- 15. A scientific theory
 - a. is absolutely certain.
 - b. is unchangeable.
 - c. may be revised as new evidence is presented.
 - d. is a controlled experiment.
- 16. The word *theory* used in a scientific sense means
 - a. a highly tested, generally accepted principle.
 - b. a guess made with very little knowledge to support it.
 - c. an absolute scientific certainty.
 - d. None of the above
- 17. observation : hypothesis ::
 - a. theory : observation

c. hypothesis : experiment

b. guess : hypothesis

- d. theory : control
- 18. Typically, the order in which the steps of the scientific method are applied is
 - a. observations, predictions, hypothesis, controlled testing, theory, verification.
 - b. predictions, observations, hypothesis, theory, controlled testing, verification.
 - c. observations, hypothesis, predictions, controlled testing, theory, verification.
 - d. observations, hypothesis, predictions, controlled testing, verification, theory.

- 19. Which of the following is *not* an example of good laboratory practice?
 - a. working alone in the lab
 - b. asking permission before using equipment
 - c. working with a partner in the lab
 - d. wearing goggles in the lab
- 20. Scientists share their research results by
 - a. publishing in scientific journals.
 - b. presenting at scientific meetings.
 - c. avoiding conflicts of interest.
 - d. Both a and b

21. Atoms are composed of

- a. protons with a positive charge.
- b. neutrons with no charge.
- c. electrons with a negative charge.
- d. All of the above
- 22. The smallest particle of carbon that can retain the chemical properties of carbon is
 - a. a carbon molecule.
 - b. a carbon macromolecule.
 - c. a carbon atom.
 - d. the nucleus of a carbon atom.
- 23. Atoms that have gained energy
 - a. have protons and neutrons that move farther apart.
 - b. lose neutrons from the nucleus.
 - c. have electrons that move to higher energy levels.
 - d. absorb electrons into the nucleus.
- 24. A single organism may contain
 - a. thousands of different enzymes, each one specific to a different chemical reaction.
 - b. one enzyme that plays a role in thousands of different chemical reactions.
 - c. approximately 100 kinds of enzymes, each one specific to a different chemical reaction.
 - d. one enzyme that is specific to photosynthesis and one enzyme that is specific to cellular respiration.
- 25. The terms base and alkaline refer to solutions that
 - a. contain dissolved sodium hydroxide.
 - b. contain more hydronium ions than hydroxide ions.
 - c. contain more hydroxide ions than hydronium ions.
 - d. contain more hydroxide ions than hydrogen ions.

26. The formation of ADP and inorganic phosphate from ATP and water is an example of which kind of reaction?

a.	condensation	c.	hydrolysis		
b.	polymerization	d.	oxidation		
of	of the following is a carbohydrate?				

27. Which of the following is a carbohydrate?

a.	DNA	с.	wax
b.	insulin	d.	sucrose

- 28. Which organic molecule below is classified as a carbohydrate?
 - a. amino acidc. nucleotideb. CH_2 chaind. sugar
- 29. Long chains of amino acids are found in
 - a. carbohydrates.c. proteins.b. lipids.d. sugars.



- 30. Refer to the illustration above. Molecules like molecule 2 are found in
 - a. carbohydrates.

c. nucleic acids.d. proteins.

- b. lipids.
- 31. All of the following are examples of lipids except
 - a. saturated fats.b. starch.c. cholesterol.d. earwax.
- 32. Saturated fatty acids contain
 - a. carbon atoms that are each bonded to four other atoms.
 - b. carbon atoms linked by double bonds.
 - c. no carboxyl (-COOH) groups.
 - d. more than 100 carbon atoms.
- 33. Lipids are soluble in
 - a. water.
 - b. salt water.

- c. oil.
- d. All of the above
- 34. Energy is released when the bond between
 - a. carbon atoms in ATP is broken.
 - b. ribose and adenine in ATP is broken.
 - c. phosphate groups in ATP is broken.
 - d. two ATP molecules is broken.
- 35. The smallest units of life in all living things are
 - a. cells.

- c. cytoplasm.
- b. mitochondria. d. Golgi apparatus.
- 36. One difference between prokaryotes and eukaryotes is that
 - a. nucleic acids are found only in prokaryotes.
 - b. mitochondria are found in larger quantities in eukaryotes.
 - c. the Golgi apparatus is found only in prokaryotes.
 - d. prokaryotes have no nuclear membrane

37. Which of the following is an example of a prokaryotic cell?

- a. an amoeba c. a bacterium
 - d. a liver cell b. a virus

38. The structure that regulates what enters and leaves the cell is called the

- a. nucleus. c. nuclear membrane.
- b. cell wall. d. plasma membrane.

39. The plasma membrane

- a. encloses the contents of a cell.
- b. allows material to enter and leave the cell.
- c. is selectively permeable.
- d. All of the above

40. A structure within a cell that performs a specific function is called a(n)

- a. organelle. c. tissue.
- d. biocenter. b. organ tissue.
- 41. A particularly active cell might contain large numbers of
 - a. chromosomes. c. mitochondria.
 - b. vacuoles.
- 42. The Golgi apparatus is an organelle that
 - a. receives proteins and lipids from the endoplasmic reticulum.
 - b. labels the molecules made in the endoplasmic reticulum with tags that specify their destination.
 - c. releases molecules in vesicles.
 - d. All of the above
- 43. Proteins are made on the
 - a. mitochondria.
 - b. ribosomes. d. plasma membrane.
- 44. The double membrane surrounding the nucleus is called the
 - a. nucleolus.

b. nuclear wall.

- 45. All cells have
 - a. a covering called a plasma membrane that surrounds the cell and controls what information and materials enter and leave it.
 - b. an internal fluid that gives shape to the cell and supports the other things within it.
 - c. either a central zone or a nucleus that contains the cell's genes.
 - d. All of the above
- 46. cell : plasma membrane ::
 - a. nucleus : chromosome
 - b. nucleus : nuclear envelope
 - c. chromosome : DNA
 - d. cell: DNA

- c. nucleoplasm.

c. nucleus.

- d. nuclear envelope.

- d. walls.



47. Refer to the illustration above. Which structure immediately identifies this cell as a eukaryote?

- a. structure 1 c. structure 3
- b. structure 2 d. structure 4
- 48. Refer to the illustration above. The cell uses structure 3
 - a. to transport material from one part of the cell to another.
 - b. to package proteins so they can be stored by the cell.
 - c. as a receptor.
 - d. to transfer energy from organic molecules to ATP.
- 49. Refer to the illustration above. Structure 1 is
 - a. the endoplasmic reticulum.
 - b. a Golgi apparatus.
 - c. a mitochondrion.
 - d. the nucleus.

50. Refer to the illustration above. This cell's chromosomes are found in

- a. structure 1.b. structure 2.c. structure 3.d. structure 5.
- 51. Refer to the illustration above. The cell shown is probably an animal cell because
 - a. it has mitochondria.
 - b. it does not have a cell wall.
 - c. it has a plasma membrane.
 - d. it does not have a nucleus.
- 52. The organelles associated with photosynthesis are the
 - a. mitochondria. c. Golgi apparatus.
 - b. chloroplasts. d. vacuoles.
- 53. The organelles in plant cells that contain a green pigment are the
 - a. mitochondria. c. chloroplasts.
 - b. bilayer lipids. d. Golgi apparatus.

54. Plant cells

- a. do not contain mitochondria.
- b. have a cell wall instead of a plasma membrane.
- c. have a large central vacuole instead of a Golgi apparatus.
- d. have chloroplasts and a cell wall.
- 55. Which of the following are examples of fossils?
 - a. shells or old bones
 - b. any traces of dead organisms
 - c. insects trapped in tree sap
 - d. All of the above
- 56. Animal fossils may form when
 - a. an animal is buried by sediment.
 - b. an animal is buried on the ocean floor, in swamps, in mud, or in tar pits.
 - c. an animal's tissue is replaced by harder minerals.
 - d. All of the above



- 57. Refer to the illustration above. An analysis of DNA from these organisms would indicate that
 - a. they have identical DNA.
 - b. they all have the same number of bones.
 - c. their nucleotide sequences show many similarities.
 - d. they all have the same number of chromosomes.
- 58. Refer to the illustration above. The similarity of these structures is one form of evidence that the organisms
 - a. share a common ancestor.
 - b. all grow at different rates.
 - c. evolved instantaneously.
 - d. live for a long time.
- 59. Refer to the illustration above. The bones labeled "X" can be referred to as
 - a. vestigial structures.
 - b. sequential structures.
 - c. homologous structures.
 - d. fossil structures.



Refer to the illustration above. While the shark and dolphin are similar in appearance, dolphins evolved from ancestors that were very different from sharks. The current similarity between sharks and dolphins is an example of:

- a. coevolution.
- b. biogeography.

- c. convergent evolution.
- d. divergent evolution.

- 61. Gene flow describes the
 - a. movement of genes from one generation to the next.
 - b. movement of genes from one population to another.
 - exchange of genes during recombination. c.
 - d. movement of genes within a population because of interbreeding.
- 62. A change in the frequency of a particular gene in one direction in a population is called
 - a. directional selection.
 - b. acquired variation.
 - c. chromosome drift.
 - d. stabilizing selection.
- 63. The hypothesis that evolution occurs at an irregular rate through geologic time is known as
 - a. directional evolution.
 - b. directional equilibrium.
 - c. punctuated equilibrium.
 - d. punctuated evolution.
- 64. Which of the following traits would *not* be useful to the study of the genetic variation in a population of fish?
 - a. the length of the fish
 - b. the color of the fish
 - c. the fin size of the fish
 - d. the diet of the fish
- 65. What type of speciation occurs when new species arise as a result of geographic isolation?
 - a. allopatric speciation
 - b. prezygotic speciation
 - c. sympatric speciation
 - d. postzygotic speciation

A Comparison of Dolphins and Sharks

- 66. The science of classifying living things is called
 - a. identification.
 - b. classification.
- c. taxonomy.
- d. speciation.
- 67. Taxonomy is defined as the science of
 - a. classifying plants according to their uses in agricultural experiments.
 - b. studying ribosomal RNA sequencing techniques.
 - c. grouping organisms according to their characteristics and evolutionary history.
 - d. studying reproductive mechanisms and gene flow.

68.

70

A Comparison of Dolphins and Sharks



Refer to the illustration above. A shark's skeleton is made of cartilage while a dolphin's skeleton is made of bone. This is one reason the two organisms are placed in different

a.	kingdoms.	c.	subspecies
b.	domains.	d.	classes.

69. The organism *Quercus phellos* is a member of the genus

a.	Plantae.	c.	Quercus.
b.	phellos.	d.	Protista.

Poison ivy is also known as *Rhus toxicodendron*. Its species identifier is

a. poison.c. ivy.b. Rhus.d. toxicodendron.

71. The scientific name of an organism

- a. varies according to the native language of scientists.
- b. is the same for scientists all over the world.
- c. may refer to more than one species.
- d. may have more than one genus name.

72. Scientists don't use the common names of organisms because

- a. an organism may have more than one common name.
- b. common names are too ambiguous.
- c. an organism rarely has the same name in different languages.
- d. All of the above

73. In which language are scientific names written?

a.	English	с.	Arabic
b.	Greek	d.	Latin

- 74. Two organisms in the same class but different orders
 - a. are in different kingdoms.
 - b. have the same genus name.
 - c. are in the same phylum.
 - d. are members of the same species.
- 75. Kingdoms are divided into phyla, and each phylum is divided into
 - a. families. c. orders.
 - b. classes. d. genera.
- 76. The correct order of the biological hierarchy from kingdom to species is
 - a. kingdom, class, family, order, phylum, genus, species.
 - b. kingdom, phylum, order, family, class, genus, species.
 - c. kingdom, phylum, class, order, family, genus, species.
 - d. kingdom, class, order, phylum, family, genus, species.
- 77. Which of the following is the *least* inclusive classification group?

a.	class	c.	phylum
b.	genus	d.	species

78. class : family ::

a.	order : phylum	
b.	genus : class	

- 79. Today, biologists classify organisms by their
 - a. physical similarities.
 - b. chemical similarities.

- c. behavioral similarities.
- d. All of the above

c. species : genusd. phylum : order

- 80. The DNA sequences of two species of sharks would
 - a. be more similar than the DNA sequences of a shark and a dolphin.
 - b. show no discernible differences.
 - c. be very close to the DNA sequences of a dolphin.
 - d. indicate how the sharks evolved.



- 81. Refer to the illustration above. Each particular feature, such as dry skin, that is used to assign an organism to a group is called a(n)
 - a. special character.
 - b. analogous character.
 - c. derived character.
 - d. homologous character.

82. An organism that breaks down organic matter, which it then absorbs, is in the

kingdom

- a. Fungi. c. Animalia.
- b. Plantae. d. Protista.
- 83. The three domain system of classification is based on similarities and differences in _____, while the six- kingdom system is based on similarities and differences in _____.
 - a. DNA; DNA, fossils, embryological development, and physical features
 - b. DNA; embryological development, fossils, physical features, and RNA
 - c. ribosomal RNA; embryological development, fossils, physical features, and various molecular structures
 - d. physical features; embryological development, fossils, physical features, and various molecular structures
- 84. Which of the following groups are placed together by cladistics but are placed in separate groups by classical taxonomy?
 - a. birds and crocodiles c
 - b. birds and mammals

- c. turtles and birds
- d. snakes and mammals

Completion

Complete each statement.

Biodiversity	Fossil	Prezygotic
Cell Theory	Homologous	Scientific Name
Chloroplasts	Hypothesis	Solute
Cytoskeleton	Mutation	Three
Frequency	Postzygotic	Three

85. An educated guess, or a(n) _____, may be tested by experimentation.

86. A substance that dissolves in another is called a(n) ______.

87. ATP contains ______ phosphate groups.

88. The statement "Cells are produced only from existing cells" is part of the _____

- 90. _____ results from flawed copies of individual genes.

91. Each kind of organism on Earth is assigned a unique two-word ______.

92. The variety of organisms at all taxonomic levels is called ______.

- 93. Reproductive isolation that occurs before fertilization is called ______ isolation.
- 94. Reproductive isolation that occurs after fertilization is called ______ isolation.
- 95. Any preserved trace of an ancient life form is a(n) ______.
- 96. Photosynthesis takes place in the ______ of plant cells.

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- 97. The meshlike network of protein fibers that supports the shape of the cell is called the
- 98. In a triple bond, ______ pair(s) of electrons is (are) shared between two atoms.

99. Allele ______ is determined by dividing the number of instances of a certain allele by the total number of alleles of all types in the population.