Exam

Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) The branch of science that studies the natural world within the context of life is 1) _____
   A) medicine.
   B) biology.
   C) chemistry.
   D) physics.
   E) geology.

2) The process by which living organisms maintain a fairly constant internal environment despite changes in the external environment is known as 2) _____
   A) chemistry.
   B) evolution.
   C) metabolism.
   D) biology.
   E) homeostasis.

3) *Molecules of life* include which one of the following? 3) _____
   A) lipids and proteins only
   B) proteins, saturated fats, monosaccharides, but not polysaccharides
   C) nonsugar carbohydrates, proteins, lipids, water
   D) water, proteins, lipids, nucleic acids, carbohydrates
   E) any noncarbon base molecule

4) Which one of the following is a TRUE statement? 4) _____
   A) All living things are made up of at least one cell.
   B) Cells arise spontaneously from nonliving chemical elements.
   C) Complex organisms can be unicellular.
   D) Cells are incapable of maintaining homeostasis because they are too small.
   E) Molecules are considered to be the smallest unit capable of exhibiting all the characteristics of life.

5) Which one of the following is a CORRECT statement regarding metabolism? 5) _____

A) Cells do not require energy to change molecules from one form to another.

B) Plants get the raw materials they need for life processes entirely from the air.

C) Cells maintain life through the breakdown of molecules and energy by chemical and physical processes.

D) Animals use energy obtained directly from the sun and chemicals obtained from plants, other animals, air, and water.

E) Few living organisms require raw materials and a constant source of energy.

6) All of these criteria are used to classify an organism as a member of the plant, animal, or fungi kingdom EXCEPT which one? 6) _____

A) the structure or body plan of the organism

B) the means by which the organism transports itself

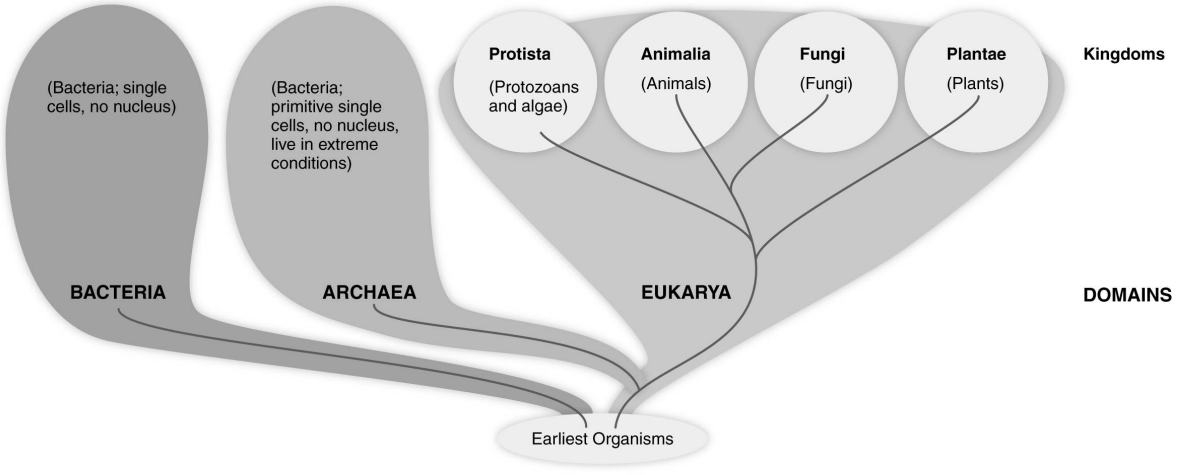
C) the mode of nutrition of the organism

D) the organism's life cycle

7) Which one of the following is a kingdom? 7) _____

A) Primates B) Bacteria C) Archaea D) Eukarya E) Animalia

8) 8) _____



Based on the figure above, which group of organisms is most closely related to members of the Kingdom Animalia?

A) Protista B) Archaea C) Plantae D) Bacteria E) Fungi

9) Which kingdom in the Domain Eukarya contains multicellular photosynthesizers? 9) _____

A) Bacteria B) Animalia C) Plantae D) Archaea E) Fungi

10) Which one of the following taxa (subgroups used in classification) applies to humans? 10) _____

A) Bacteria
B) Invertebrates
C) Prokarya
D) Mammals
E) Protista

11) Which one of the following sequences represents taxa arranged in order from largest, most all inclusive, to smallest? 11) _____

A) kingdom, domain, phylum, order, class, genus, species, family
B) species, genus, family, order, class, phylum, kingdom, domain
C) domain, kingdom, phylum, class, order, family, genus, species
D) kingdom, phylum, domain, class, order, genus, species, family
E) domain, kingdom, phylum, class, order, genus, species, family

12) Humans possess several characteristics that, when taken together, differentiate them from other organisms. These characteristics include all of the following EXCEPT which one? 12) _____

A) large brain relative to body mass
B) capacity for complex language
C) bipedalism
D) opposable thumbs
E) the inability to maintain a constant internal body temperature

13) Which one of the following best describes the evolutionary advantage of bipedalism? 13) _____

A) frees the hands for carrying objects
B) increases the chance that an organism can communicate through the written word
C) in early humans, allowed for complex motions associated with the use of tools
D) allows an organism to have precise control over the action of the thumb and fingers
E) results in improved eye-hand coordination

14) Which one of the following sequences is CORRECT in terms of level of organization from least to most complex? 14) _____

A) cells, tissues, organs, organ systems, organism
B) tissues, organ systems, population, cells, organism
C) atoms, cells, organs, community, population
D) atoms, cells, organism, organ systems, ecosystem

15) Which one of the following is the lowest level of biological organization in which evolutionary change can occur? 15) _____

A) population B) community C) cell D) organism

16) Which one of the following of the following statements is FALSE? 16) _____

A) Knowledge gained through the scientific method can be used to predict the natural world.

B) Because scientific knowledge is empirical, it cannot be tested.

C) The scientific method involves many different ways of obtaining information.

D) Science is a process.

E) Scientists use the scientific method to gain knowledge about the natural world.

17) Which one of the following best describes the proper sequence of steps involved in the scientific method? 17) _____

a. state hypothesis
b. observe
c. experiment
d. support or disprove hypothesis
e. form a prediction

A) a, b, c, e, d

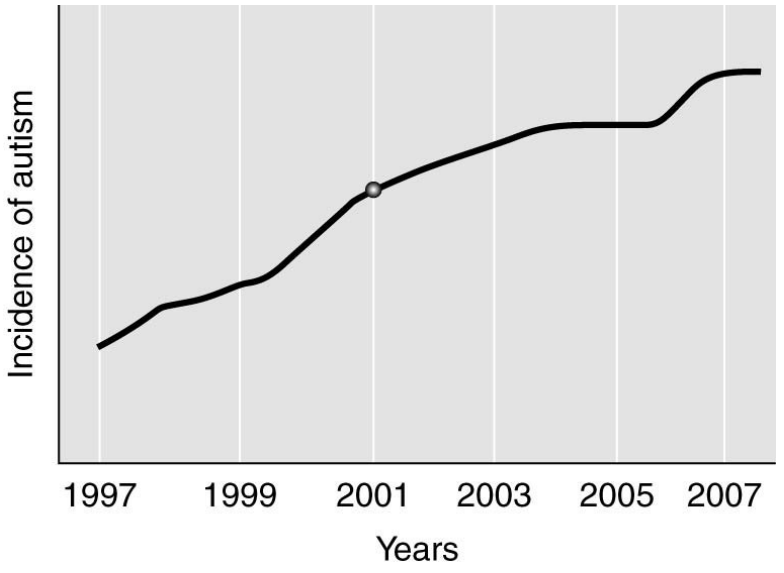
B) e, b, a, c, d

C) b, a, d, e, c

D) a, b, c, d, e

E) b, a, e, c, d

18) 18) _____



The graph above depicts the relative increase in autism in children from 1997 to 2007 living in California. In 2001, the additive thimerosal was removed from most childhood vaccines. Based on the information presented in the graph, what can be concluded about the hypothesis that thimerosal causes autism?

A) Thimerosal, at the very least, contributes to the occurrence of autism as evidenced by the almost logarithmic increase in children with autism from 2001 to 2007.
B) The results of the study are inclusive.
C) Thimerosal requires some other agent to help induce autism.
D) A sharp decrease in the cases of autism would be expected after 2001 if thimerosal was the causative agent of autism.
E) Prior to 2001, thimerosal clearly influenced the cases of autism in California.

19) Which one of the following statements regarding scientific theory is FALSE? 19) _____

A) A hypothesis that has been repeatedly tested over time, and found to be true, usually becomes a scientific theory.
B) A scientific theory is a speculation as to the possible outcome of an experiment.
C) As new information is gained over time, scientific theories can be modified.
D) The highest status that a hypothesis can achieve is becoming a scientific theory.
E) A scientific theory explains scientific facts with a high degree of reliability.

20) Peer review is essential to the scientific process because 20) _____

A) the process can lead to improvements in articles prior to being published.
B) several experts in the field are able to scrutinize a finding before it can be published.
C) it tests hypotheses proposed by other investigators.
D) the process immediately validates any hypotheses tested in the experiments.
E) it is the primary means for informing the general public about new information in the field.

21) A farmer wants to improve crop yield in his fields by testing the effectiveness of a new pesticide available on the market. Which one of the following is the best control for this experiment? 21) _____

A) a lower concentration of new pesticide used on the control field than on the experimental field
B) a higher concentration of new pesticide used on the control field than the experimental field
C) more water on the control field than on the experimental field
D) no new pesticide used on the control field; new pesticide used only on the experimental field
E) more shade on the control field than on the experimental field

22) According to a recent study of nearly 140,000 women who were enrolled in the Women's Health Initiative, women who breast-fed their babies had a lower risk of developing heart disease and diabetes later in life than women who did not breast-feed their babies. These research findings are an example of 22) _____

A) skepticism.
B) deductive reasoning.
C) causation.
D) correlation.
E) hypothesis testing.

23) How does scientific information in peer-reviewed journals differ from that in newspapers? 23) _____

A) Articles often include political, ethical, and economic ramifications of the scientific findings.
B) Information is less in-depth and easily understood by the average reader.
C) Information is not approved by other scientists before its publication.
D) Information is more technical; readers usually require a background in the field in order to understand the article.
E) The article is written by a reporter, not a researcher.

24) One of the most common ways to get information out to a wide audience in the least amount of time regarding hot topics in science is by using 24) _____

A) the Discovery Channel on television.
B) books.
C) peer-reviewed journals.
D) general interest news magazines or newspapers.
E) science magazines.

25) A student needs information from the National Institutes of Health, a government agency. Which one of the following endings should he or she look for in the Internet address? 25) _____

A) com B) nih C) edu D) gov E) org

26) The Internet has been used as a rapid means to obtain information, including scientific ideas. Which one of the following statements about the Internet as a source of scientific information is FALSE? 26) _____

A) At present, the Internet is less regulated than broadcast and print media.
B) Anyone can post "scientific" information, regardless of whether the information is misleading or not true.
C) Individuals and/or groups may post information to promote their own personal interests rather than ideas that have been tested through the scientific process.
D) Information on the Internet is generally very reliable because inaccurate information is quickly removed or corrected.

27) Approaching new information with a questioning attitude and looking for evidence to support the claim involves 27) _____

A) the process of predicting an outcome.
B) skepticism.
C) deductive reasoning.
D) curiosity.
E) inductive reasoning.

28) The process of displaying and organizing data to represent connections is known as 28) _____

A) statistics.
B) correlation and causation.
C) differential equations.
D) graphing.
E) algebra.

29) In science, graphs are often used to display data collected from an experiment. Which one of the following is TRUE regarding a graph? 29) _____

A) Independent variables are generally not included on a graph.
B) The dependent variable is plotted on the *y*-axis.
C) Most graphs are plotted on three axes.
D) Graphs always involve plots of individual data points.
E) The horizontal axis is known as the ordinate.

30) Which one of the following is TRUE regarding knowledge gained through scientific investigation? 30) _____

A) The knowledge has resulted in less-efficient sources of energy yet better health care.
B) The knowledge can be used to prove or disprove religious beliefs.
C) The information can be used to detect problems at an early stage and correct mistakes.
D) Society as a whole generally ignores scientific information.
E) Scientific knowledge cannot be used to improve human life through technology.

31) According to the Health & Wellness essay, *The Growing Threat of Antibiotic-Resistant Bacteria*, which one of the following is TRUE? 31) _____

A) Antibiotics should be prescribed to treat viral infections, such as the common cold.
B) The more we use antibiotics, the more we encourage the rise of antibiotic-resistant bacterial strains.
C) Antibiotics kill only harmful bacteria.
D) Because of the indiscriminate use of antibiotics in medicine and society, some bacterial strains have now become less resistant to almost all currently existing antibiotics.
E) Consumers should support the use of antibiotics in livestock feeds and on fruit trees to decrease the incidence of food-borne infections.

32) Which one of the following experiments would be considered acceptable in our society? 32) _____

A) Testing the effectiveness of a newly developed antibiotic using deliberate exposure of humans to antibiotic-resistant bacteria.
B) Determining the effects of cocaine use on babies born to cocaine-using mothers.
C) Testing the effectiveness of a new AIDS vaccine using deliberate exposure of human volunteers to HIV.
D) Testing the effects of radiation exposure on volunteers.
E) Determining the response of a patient's "incurable" cancer to a newly developed cancer drug.

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

33) Because the natural world includes all energy and matter, it also includes all living organisms. 33) _____

34) Plants obtain their energy directly from the soil, air, and water in their environment. 34) _____

35) Human are only one species of many different primates that prefer to walk upright on two legs. 35) _____

36) The kingdom Protista primarily includes multicellular eukaryotic organisms. 36) _____

37) The validity of a prediction in the scientific method is determined by experimentation or observation. 37) _____

38) "Double-Blind" experiments are designed so that only subjects do not know if they are receiving placebo or drug. 38) _____

39) After years of experimentation and testing, it is possible to prove that a hypothesis is true, at which point it becomes absolute truth. 39) _____

40) A theory is a hypothesis that has been tested many times and continues to be supported. 40) _____

41) Special-interest groups are not permitted to post information as science on the Internet unless it has undergone peer review. 41) _____

42) Scientific knowledge cannot prove or disprove the existence, or importance to us, of issues that fall outside of the natural world. 42) _____

43) The pertussis (whooping cough) vaccine has virtually eliminated whooping cough in the United States. 43) _____

44) The available evidence suggests that the measles vaccine may cause autism. 44) _____

MATCHING. Choose the item in column 2 that best matches each item in column 1.

Match each criterion that defines living organisms to its example.

45) Many species of fish increase swimming activity when moving into colder waters. 45) _____

46) All animals consume plants, animals, or other organisms in their environment. 46) _____

47) Plants growing in flower beds around a house close leaf pores during the hot hours of the day. 47) _____

48) Through years of exposure, many insects have become resistant to insecticides used in agriculture. 48) _____

49) Chemical analysis of a plant indicates that it is primarily composed of carbon, hydrogen, nitrogen, oxygen, sulfur, and phosphorous; these elements are generally lacking in most rocks. 49) _____

50) Skin cells, like the bacteria living on human skin, give rise to new individual cells. 50) _____

51) Certain blood vessels in humans constrict or dilate in during intense exercise. 51) _____

A) Living things maintain homeostasis.

B) Living things have a different molecular composition than nonliving things.

C) Living things require energy and raw materials.

D) Populations of living things evolve.

E) Livings things grow and reproduce.

F) Living things respond to their external environment.

Match each domain or kingdom to its description.

52) All consume other organisms for energy and are multicellular eukaryotes; members range from simple sponges to complex primates like humans. 52) _____

53) Some members are unicellular, while others are multicellular eukaryotes; some, but not all, undergo photosynthesis; protozoa and algae are common examples of the kingdom. 53) _____

54) Members of this group are responsible for breaking down the bodies of dead organisms, thereby releasing nutrients back into the environment. 54) _____

55) Organisms are single celled, lack membrane-bound nuclei or other cellular components, and are found everywhere on the planet. 55) _____

56) This group includes multicellular, eukaryotic organisms that convert energy from the sun into food; tallest organisms on the planet. 56) _____

57) This group includes unicellular prokaryotes that tend to live in extreme environments such as hot springs. 57) _____

A) Protista

B) Bacteria

C) Animalia

D) Plantae

E) Archaea

F) Fungi

Each of the following terms is related to the scientific process. Match each to its description.

58) a possible explanation to a proposed problem — 58) _____

59) making a generalization from knowledge gained from specific cases — 59) _____

60) a hypothesis that has been extensively tested and found to be true — 60) _____

61) the process of testing ideas and gaining information about the natural world — 61) _____

62) using a general statement to predict/reason the outcome of a specific case — 62) _____

63) when testing a prediction, this accounts for all possible variables except the variable being considered — 63) _____

A) controlled experiment

B) hypothesis

C) scientific method

D) inductive reasoning

E) theory

F) deductive reasoning

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

64) The four organic molecules found in all living systems are carbohydrates, nucleic acids, lipids, and _____. 64) _____

65) A(n) _____ is a category of the classification system of organisms that can include multiple kingdoms. 65) _____

66) The chemical and physical processes that are involved in energy and molecular transformations in living organisms are collectively termed _____. 66) _____

67) Organisms made up of one cell are said to be _____. 67) _____

68) Unicellular microorganisms that lack a membrane-bound nucleus and other membranous organelles are classified into two domains: _____ and _____. 68) _____

69) A group of similar organisms capable of interbreeding and producing fertile offspring is a(n) _____. 69) _____

70) The ability to stand upright and walk on two legs is termed _____. 70) _____

71) Humans can grasp objects between their thumbs and fingers because the thumb is _____. 71) _____

72) A group of tissues working together for a common purpose is known as a(n) _____. 72) _____

73) A factor of interest that can be manipulated to create an experimental group is called a(n) _____. 73) _____

74) The process by which an individual makes a generalization after examining specific cases is termed _____ reasoning. 74) _____

75) A(n) _____ is a tentative statement about the natural world that can lead to a testable deduction. 75) _____

76) A carefully planned and executed manipulation of the natural world used to test a prediction in the scientific method is a(n) _____. 76) _____

77) The first step of the scientific method is _____. 77) _____

78) A properly designed controlled experiment should include both a(n) _____ group and a(n) _____ group. 78) _____

79) A display of data obtained from scientific experiments can often be described using a(n) _____ to clarify the meaning of experimental results. 79) _____

80) When data are presented in a graph, independent variables such as time or age should be plotted on the _____ axis. 80) _____

81) Information that takes the form of a testimonial is considered to be _____ evidence, not scientific evidence because it is not based on empirical evidence. 81) _____

82) The application of scientific knowledge to improve the condition of humans is known as _____. 82) _____

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

83) Explain how the characteristics of bipedalism and opposable thumbs are advantageous to humans.

84) You have been asked to test the effectiveness of drug X in preventing the growth of certain types of cancerous cells. Your responsibilities include designing and executing the experimental approach. After completing the study, you realize that no control variables were defined. How will this impact your drug study?

85) While out on a trip to a remote location in South America, you discovered an organism on a beautiful tropical flower. You have no idea about the classification of this organism. What features or characteristics of the new organism should you look for to at least be able to determine the kingdom it belongs to?

1) B
2) E
3) D
4) A
5) C
6) B
7) E
8) E
9) C
10) D
11) C
12) E
13) A
14) A
15) A
16) B
17) E
18) D
19) B
20) B
21) D
22) D
23) D
24) D
25) D
26) D
27) B
28) A
29) B
30) C
31) B
32) E
33) TRUE
34) FALSE
35) FALSE
36) FALSE
37) TRUE
38) FALSE
39) FALSE
40) TRUE
41) FALSE
42) TRUE

43) FALSE
44) FALSE
45) F
46) C
47) F
48) D
49) B
50) E
51) A
52) C
53) A
54) F
55) B
56) D
57) E
58) B
59) D
60) E
61) C
62) F
63) A
64) proteins
65) domain
66) metabolism
67) unicellular
68) Bacteria; Archaea
69) species
70) bipedalism
71) opposable
72) organ
73) variable
74) inductive
75) hypothesis
76) experiment
77) observation
78) experimental; control
79) graph
80) horizontal or abscissa or x-
81) anecdotal
82) technology
83) Bipedalism frees the hands and forearms for carrying items, tools, food, and even children. Coupled with opposable thumbs, these features have undoubtedly contributed to better defense against predators, increased utilization of resources, and even advanced communication through gesturing and written symbols.

84) Failure to define the control variables implies that many unintended factors were left to change with the application of the drug. This would prevent you from determining whether any inhibition of the cancerous cells was due to drug X or some other factor that you did not control. The result is the study would have to be repeated using appropriate controlled variables.

85) By observing whether the creature feeds on other organisms, you can potentially determine if it is an animal. Typically organisms that have a green appearance contain chlorophyll, which suggests that it undergoes photosynthesis, a feature of Plants and Protists.