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Correct answers located at the end of the chapter.

1) Members of the same species share many more characteristics compared to those shared by members of the same kingdom.
   - ◎ true
   - ◎ false

2) Viruses are *not* classified in any of Whittaker's five kingdoms.
   - ◎ true
   - ◎ false

3) Members of the kingdom Fungi are photosynthetic.
   - ◎ true
   - ◎ false

4) A scientist studying helminths is working with bacteria.
   - ◎ true
   - ◎ false

5) The fossil record has established that prokaryotes existed on Earth for approximately two billion years before eukaryotes evolved.
   - ◎ true
   - ◎ false

6) It has been over 25 years since a new infectious disease has emerged in the world.
   - ◎ true
   - ◎ false

7) The term *sterile* means free of all life forms.
   - ◎ true
   - ◎ false

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8) All microorganisms are parasites.
   - ◎ true
   - ◎ false

9) During a scientific experiment, the control group is used to directly test or measure the consequences of a variable in the study.
   - ◎ true
   - ◎ false

10) The scientific method involves formulating a tentative explanation, called the hypothesis, to account for what has been observed or measured.
   - ◎ true
   - ◎ false

11) Once an organism is assigned to a particular taxonomic hierarchy, it is permanent and cannot be revised.
   - ◎ true
   - ◎ false

12) When the results of an experiment support a hypothesis, the hypothesis can now be considered a theory.
   - ◎ true
   - ◎ false

13) Within the Woese-Fox system, the three domains are Bacteria, Protista, Eukarya.
   - ◎ true
   - ◎ false

14) One classically distinguishing characteristic of archaea is that they generally live in extreme environments.
   - ◎ true
   - ◎ false

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15) Some microorganisms can photosynthesize, but their overall contribution to Earth's atmospheric oxygen is very small in comparison to plant photosynthesis.

◎ true
◎ false

16) Any microorganism on or in the human body is considered a pathogen.

◎ true
◎ false

17) Theories are supported by more evidence than hypotheses.

◎ true
◎ false

18) In which of the following conditions are microbial infections often implicated as a cause?

A) Gastric ulcers
B) Coronary artery disease
C) Cervical cancer
D) Diabetes
E) Epilepsy

19) Disease-causing microorganisms are called

A) decomposers.
B) prokaryotes.
C) pathogens.
D) eukaryotes.
E) fermenters.

20) The microorganisms that recycle nutrients by breaking down dead matter and wastes are called

A) decomposers.
B) prokaryotes.
C) pathogens.
D) eukaryotes.
E) fermenters.

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21) The microorganisms that do *not* have a nucleus in their cells are called
A) decomposers.
B) prokaryotes.
C) pathogens.
D) eukaryotes.
E) fermenters.

22) When humans manipulate the genes of microorganisms, the process is called
A) bioremediation.
B) genetic engineering.
C) epidemiology.
D) immunology.
E) taxonomy.

23) Which of the following are *not* considered microorganisms?
A) Mosquitoes
B) Protozoa
C) Bacteria
D) Viruses
E) Fungi

24) All microorganisms are best defined as organisms that
A) cause human disease.
B) lack a cell nucleus.
C) are infectious particles.
D) are too small to be seen with the unaided eye.
E) can only be found growing in laboratories.

25) Which activity is an example of biotechnology?
A) Bacteria in the soil secrete an antibiotic to kill competitors.
B) A microbiologist uses a microscope to study bacteria.
C) Humans use yeast to make beer and wine.
D) *Mycobacterium tuberculosis*causes tuberculosis in the lungs.
E) Public health officials monitor diseases in a community.

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26) Which of the following is a unique characteristic of viruses that distinguishes them from the other major groups of microorganisms?
A) Viruses cause human disease.
B) Viruses are composed of cells that lack nuclei.
C) Viruses may infect multiple types of organisms.
D) Viruses contain genetic material.
E) Viruses lack ribosomes.

27) Who was the Dutch merchant that made and used quality magnifying lenses to see and record microorganisms?
A) Francesco Redi
B) Antonie van Leeuwenhoek
C) Louis Pasteur
D) Joseph Lister
E) Robert Koch

28) Pasteur used swan-neck flasks in his experiments to prove that
A) air had "vital forces" capable of spontaneous generation.
B) microbial fermentation could be used to make wine.
C) dust in air was a source of living microorganisms.
D) microorganisms could cause disease.
E) microorganisms could be grown in laboratory infusions.

29) Which of the following is *not* a process in the scientific method?
A) Belief in a preconceived idea
B) Formulation of a hypothesis
C) Systematic observation
D) Laboratory experimentation
E) Development of a theory

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30) Spontaneous generation is the idea that
A) germs cause infectious diseases.
B) microbes are diverse and ubiquitous.
C) microbes placed in an infusion can grow in it.
D) aseptic techniques reduce microbes in medical settings.
E) living things arise from nonliving matter.

31) Koch's postulates are criteria used to establish that
A) microbes are found on dust particles.
B) a specific microbe is the cause of a specific disease.
C) life-forms can only arise from preexisting life-forms.
D) a specific microbe should be classified in a specific kingdom.
E) microbes can be used to clean up toxic spills.

32) Which of the following is a taxon that contains all the other taxa listed?
A) Species
B) Phylum
C) Kingdom
D) Genus
E) Family

33) Select the correct order of taxa from *most* inclusive to *least* inclusive.
A) Phylum, class, order, family, genus
B) Class, order, family, genus, phylum
C) Order, family, genus, phylum, class
D) Family, genus, phylum, class, order
E) Genus, phylum, class, order, family

34) Which of the following is a scientific name?
A) Bacteria
B) Protista
C) Species
D) *Bacillus subtilis*
E) Bacilli

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35) Taxonomy does *not* involve
A) nomenclature.
B) classification.
C) taxa.
D) identification.
E) Koch's postulates.

36) The smallest taxon is
A) genus.
B) species.
C) kingdom.
D) family.
E) phylum.

37) The study of evolutionary relationships among organisms is called
A) biotechnology.
B) genetics.
C) recombinant DNA.
D) phylogeny.
E) taxonomy.

38) What term would be best associated with an experiment that compares the similarities in DNA or RNA sequences between two different bacterial species?
A) Phylogenetic
B) Bioremediation
C) Binomial nomenclature
D) Morphologic
E) Taxonomic

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39) A scientist discovers a new microbial species. It is a single-celled eukaryote without cell walls. In which kingdom will it likely be classified?

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

40) A scientist collecting grass clippings to find the source of an outbreak of tularemia is an example of working in the field of

A) food microbiology.
B) epidemiology.
C) agricultural microbiology.
D) genetic engineering.
E) biotechnology.

41) Helminths are

A) bacteria.
B) protozoa.
C) molds.
D) parasitic worms.
E) infectious particles.

42) All of the following pertain to photosynthesis, *except*

A) it occurs only in members of the kingdom Plantae.
B) carbon dioxide is converted to organic material.
C) it contributes to the oxygen content in the atmosphere.
D) it is fueled by light.
E) it is important to each ecosystem's flow of energy and food.

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43) Organisms called parasites are
A) always classified in the kingdom Bacteria.
B) always harmful to their host.
C) the decomposers in ecosystems.
D) always viruses.
E) free-living.

44) Who was the surgeon that advocated using disinfectants on hands and in the air prior to surgery?
A) Joseph Lister
B) Ignaz Semmelweis
C) Robert Koch
D) Louis Pasteur
E) Antonie van Leeuwenhoek

45) Which scientist showed that anthrax was caused by the bacterium *Bacillus anthracis*?
A) Joseph Lister
B) Ignaz Semmelweis
C) Robert Koch
D) Louis Pasteur
E) Antonie van Leeuwenhoek

46) Which of the following lists the correct descending taxonomic hierarchy (left to right)?
A) Family, order, class
B) Family, genus, species
C) Genus, species, family
D) Class, phylum, order
E) Kingdom, domain, phylum

47) When assigning a scientific name to an organism,
A) the species name is capitalized.
B) the species name is placed first.
C) the species name can be abbreviated.
D) both genus and species names are capitalized.
E) both genus and species names are italicized or underlined.

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48) In Whittaker's taxonomic system, which kingdom would include protozoans and algae?
A) Bacteria
B) Protista
C) Mycetae
D) Plantae
E) Animalia

49) Who proposed assigning organisms to one of three domains?
A) Robert Koch and Louis Pasteur
B) Antonie van Leeuwenhoek
C) Carl Woese and George Fox
D) Robert Whittaker
E) Francesco Redi

50) According to the Whittaker system of classification, which kingdom does *not* contain any eukaryotes?
A) Monera
B) Protista
C) Mycetae
D) Plantae
E) Animalia

51) Which of the following are the main decomposers of the earth?
A) Bacteria and fungi
B) Bacteria and viruses
C) Algae and viruses
D) Protists and fungi
E) All organisms are decomposers.

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52) Prior to the COVID-19 pandemic, the most common infectious cause of death worldwide was
A) HIV/AIDS.
B) stroke.
C) heart disease.
D) pneumonia.
E) malaria.

53) Which of the following diseases is transmitted by mosquitoes?
A) Diarrheal diseases
B) Tuberculosis
C) Malaria
D) Septicemia
E) Influenza

54) Which of the following diseases is transmitted by mosquitoes?
A) Lyme disease
B) Monkeypox
C) Zika
D) Bacteremia
E) COVID-19

55) All of the following are correct about prokaryotes, *except*
A) they are smaller than eukaryotes.
B) they lack a nucleus.
C) they are less complex than eukaryotes.
D) they have organelles.
E) they are found nearly everywhere.

56) All of the following contribute to the rise of emerging diseases, *except*
A) the decrease in drug-resistant bacteria.
B) human encroachment on wild habitats.
C) changes in agricultural practices.
D) human populations are more mobile.

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57) Which scientist discovered heat-resistant bacterial spores?

A) Joseph Lister
B) Ignaz Semmelweis
C) Robert Koch
D) Ferdinand Cohn
E) Antonie van Leeuwenhoek

58) Which of the following is the correct way to write the scientific name of this bacterium?

A) Assistive technology users: capitalization and formatting in the answer choices is essential. We suggest you adjust your verbosity settings or read code samples word-by-word or letter-by-letter.Staph Aureus
B) Assistive technology users: capitalization and formatting in the answer choices is essential. We suggest you adjust your verbosity settings or read code samples word-by-word or letter-by-letter.Staphylococcus Aureus
C) Assistive technology users: capitalization and formatting in the answer choices is essential. We suggest you adjust your verbosity settings or read code samples word-by-word or letter-by-letter.

Staphylococcus aureus

D) Assistive technology users: capitalization and formatting in the answer choices is essential. We suggest you adjust your verbosity settings or read code samples word-by-word or letter-by-letter.Staphylococcus Aureus
E) Assistive technology users: capitalization and formatting in the answer choices is essential. We suggest you adjust your verbosity settings or read code samples word-by-word or letter-by-letter.S. Aureus

59) Which environment are prokaryotes belonging to domain Archaea typically associated?

A) A human's large intestine
B) A hot spring
C) A pond
D) A sewage treatment plant
E) A beer production facility

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60) What was the main reason why the five-kingdom system was replaced by the three-domain system?
A) Scientists realized that Archaea were as biochemically and genetically distinct from Bacteria as they were from Eukarya.
B) Scientists could not place newly discovered protists in any of the existing five kingdoms.
C) Morphology alone wasn't sufficient to explain the true relationships within the tree of life.
D) Bacteria were slightly larger compared with cells assigned to the domain Archaea.

61) When microbes are introduced into the environment to restore stability, the process is called
A) bioremediation.
B) genetic engineering.
C) epidemiology.
D) immunology.
E) taxonomy.

62) For which condition is a microbial infection typically NOT implicated as a cause?
A) Gastric ulcers
B) Female infertility
C) Coronary artery disease
D) Cervical cancer
E) Alzheimer's disease

63) Cyanide is a chemical used to dissolve gold and is harmful to the environment and organisms living there. A couple of biochemists came up with the idea of using the bacteria in the genus *Pseudomonas* to break down the cyanide used by a gold mining company. Which term refers to this use of bacteria?
A) Bioremediation
B) Immunoextraction
C) Decomposition
D) Bioextraction
E) Biosynthesis

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64) Which of the following branches of microbiology is utilized in diagnosing or treating someone who has broken out in hives and is experiencing respiratory distress due to an exposure to a microbial toxin?
A) Agricultural microbiology
B) Epidemiology
C) Biotechnology
D) Immunology
E) Industrial microbiology

65) The nurse in an emergency department is reviewing discharge instructions with a patient. The patient asks them, "what does it mean by 'zoonosis'?"
What is the *best* response by the nurse?
A) A zoonosis refers to any viral disease.
B) A zoonosis is any disease which can be successfully treated with antibiotics.
C) A zoonosis is a disease typically found in animals, but which infects humans.
D) A zoonosis is a disease caused by a eukaryotic parasite.

66) A scientist that makes predictions from a hypothesis and then performs experiments to test these predictions is using what type of reasoning?
A) Inductive
B) Deductive
C) Instructive
D) Abductive
E) Trial-and-error

67) Recently, a particular virus has been mentioned in the news, with many cases in Central and South America and increasing numbers of cases in the United States. Five years ago this particular virus was essentially unheard of in these areas. This is an example of
A) an endemic virus.
B) an emerging infectious disease.
C) genetic recombination.
D) a pandemic.

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68) Numerous cases of microcephaly have been observed in the newborn babies of women who were infected with Zika virus during pregnancy. This led to the proposed hypothesis that Zika virus was causing the birth defects. This is an example of

A) hypothesis testing.
B) deductive reasoning.
C) inductive reasoning.
D) theory development.

69) You identify a new species of microorganism living in an undersea thermal vent. The microbe is a single cell organism lacking a nucleus. Which domain would be *least* likely to include your new species?

A) Domain Archaea
B) Domain Bacteria
C) Domain Eukarya
D) None of the choices are correct.

70) A scientist makes a hypothesis that increased susceptibility to mosquito bites has a genetic basis. What is *not* an appropriate next step?

A) She should present the data that promotes this hypothesis to get feedback from other scientists.
B) She should repeat the experiments that led her to this hypothesis.
C) She should propose a theory based on the results from her preliminary experiment.
D) She should design a set of experiments that will test her hypothesis differently.

71) Which of the following is the *least* useful information to determine the evolutionary relatedness of two species?

A) The environments they live in
B) Their DNA sequences
C) The morphological features that they have in common
D) All of these characteristics are important for determining evolutionary relatedness.

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72) A scientist identifying a newly discovered microbe by comparing its cellular structure to that of already described species would be engaged in microbial
A) morphology.
B) genetics.
C) ecology.
D) virology.
E) physiology.

73) A group of scientists recently traveled to Florida to study sargassum, dense mats of seaweed that may foul beaches in the Atlantic during summer. These scientists are most likely
A) phyocologists.
B) protozoologists.
C) mycologists.
D) taxonomists.
E) bacteriologists.

74) The study of fungi, including yeasts, molds and mushrooms, is called
A) mycology.
B) bacteriology.
C) fungology.
D) phycology.
E) protozoology.

75) Compared to eukaryotic cells, prokaryotic cells are generally
A) smaller and lacking organelles.
B) microscopic and multicellular.
C) equally complex.
D) larger.
E) surrounded by a proteinaceous capsid.

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76) Prokaryotic organisms may generally be recognized by
A) their large size.
B) the presence of a membrane-bound nucleus.
C) the presence of a proteinaceous capsid.
D) their unicellular organization and microscopic size.
E) the presence of mitochondria.

77) What unit is most appropriate for measuring a typical bacterial cell?
A) Meters
B) Nanometers
C) Micrometers
D) Centimeters
E) Kilometers

78) The scientific field involved in the identification, classification, and naming of organisms is called_____.

79) The area of biology that states that living things undergo gradual structural and functional changes over long periods of time is referred to as_____.

80) Living things ordinarily too small to be seen with the unaided eye are termed_____.

81) Microorganisms composed only of hereditary material wrapped in a protein covering are referred to as_____.

82) Specialized, membrane-bound internal structures that are found in eukaryotes but not in prokaryotes are called_____.

83) Well-known diseases that are increasing in occurrence are referred to what kind of disease?

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84) Discuss three different beneficial consequences and three different detrimental consequences of killing all microorganisms on the earth.

85) Discuss five reasons why infectious diseases are increasing in number around the world.

86) Outline the experiment that Louis Pasteur did with swan-necked-shaped tubes to disprove spontaneous generation.

87) Predict one reason why water contaminated by the algae *Microcystis* cannot be made safe by boiling.

88) Cases of chikungunya virus in the United States are primarily restricted to Florida and the Southeastern coast. Briefly explain a reason for this distribution.

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89) Briefly explain

1. (1) why hospitals are such a common source of infectious disease, and
2. (2) why aseptic technique limits infection.

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Answer Key

Test name: Chapter 01

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

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38) A
39) B
40) B
41) D
42) A
43) B
44) A
45) C
46) B
47) E
48) B
49) C
50) A
51) A
52) D
53) C
54) C
55) D
56) A
57) D
58) C
59) B
60) A
61) A
62) E
63) A
64) D
65) C
66) B
67) B
68) C
69) C
70) C
71) A
72) A
73) A
74) A
75) A
76) D
77) C

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78) taxonomy
79) evolution
80) microorganisms
81) viruses
82) organelles
83) reemerging
84) Short Answer
85) Short Answer
86) Short Answer
87) Short Answer
88) Short Answer
89) Short Answer

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