ch01

Student: _____

1. Disease-causing microorganisms are called
   A. decomposers.
   B. prokaryotes.
   C. pathogens.
   D. eukaryotes.
   E. fermenters.

2. The microorganisms that recycle nutrients by breaking down dead matter and wastes are called
   A. decomposers.
   B. prokaryotes.
   C. pathogens.
   D. eukaryotes.
   E. fermenters.

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

4. When humans manipulate the genes of microorganisms the process is called

   A. bioremediation.
   B. genetic engineering.
   C. epidemiology.
   D. immunology.
   E. taxonomy.

5. Which of the following are *not* considered microorganisms?
   A. mosquitoes
   B. protozoa
   C. bacteria
   D. viruses
   E. fungi

6. 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.

7. Which activity is an example of biotechnology?
   A. bacteria in the soil secreting an antibiotic to kill competitors
   B. a microbiologist using the microscope to study bacteria
   C. humans using yeast to make beer and wine
   D. *Mycobacterium tuberculosis* in the lungs causing tuberculosis
   E. public health officials monitoring diseases in a community

8. Which of the following is a unique characteristic of viruses that distinguishes them from the other major groups of microorganisms?
   A. cause human disease
   B. lack a nucleus
   C. cannot be seen without a microscope
   D. contain genetic material
   E. lack cell structure

9. The Dutch merchant who made and used quality magnifying lenses to see and record microorganisms was
   A. Francesco Redi.
   B. Antonie van Leeuwenhoek.
   C. Louis Pasteur.
   D. Joseph Lister.
   E. Robert Koch.

10. 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.

11. Which of the following is *not* a process in the scientific method?
    A. belief in a preconceived idea
    B. formulate a hypothesis
    C. systematic observation
    D. laboratory experimentation
    E. development of a theory

12. Spontaneous generation is the belief 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.

13. 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.

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

15. Which of the following is a scientific name?
    A. bacteria
    B. Protista
    C. species
    D. *Bacillus subtilis*
    E. bacilli

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

17. The smallest and most significant taxon is
    A. Genus.
    B. Species.
    C. Kingdom.
    D. Family.
    E. Phylum.

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

19. A scientist studying the sequence of nucleotides in the rRNA of a bacterial species is working on
    A. determining evolutionary relatedness.
    B. bioremediation.
    C. recombinant DNA.
    D. nomenclature.
    E. determining if that species is the cause of a new disease.

20. 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. Monera
    B. Protista
    C. Fungi
    D. Animalia
    E. Plantae

21. A scientist collects 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.

22. Helminths are
    A. bacteria.
    B. protozoa.
    C. molds.
    D. parasitic worms.
    E. infectious particles.

23. 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.

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

25. The surgeon who advocated using disinfectants on hands and in the air prior to surgery was
    A. Joseph Lister.
    B. Ignaz Semmelweis.
    C. Robert Koch.
    D. Louis Pasteur.
    E. Antonie van Leeuwenhoek.

26. 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

27. Select 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

28. 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.

29. The scientist(s) that proposed assigning organisms to one of three domains is(are):
    A. Robert Koch and Louis Pasteur.
    B. Antonie van Leeuwenhoek.
    C. Carl Woese and George Fox.
    D. Robert Whittaker.
    E. Francesco Redi.

30. In Whittaker's system, the protozoa and algae are classified in the kingdom
    A. Monera.
    B. Protista.
    C. Mycetae.
    D. Plantae.
    E. Animalia.

31. Which kingdom does *not* contain any eukaryotes?
    A. Monera
    B. Protista
    C. Mycetae
    D. Plantae
    E. Animalia

32. 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

33. The most common infectious cause of death worldwide is
    A. HIV/AIDS.
    B. stroke.
    C. heart disease.
    D. cancer.
    E. malaria.

34. Which of the following diseases is transmitted by mosquitoes?
    A. diarrheal diseases
    B. tuberculosis
    C. malaria
    D. septicemia
    E. influenza

35. 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.

36. 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. populations are more mobile.

37. Which scientist discovered heat resistant bacterial spores?
    A. Joseph Lister
    B. Ignaz Semmelweis
    C. Robert Koch
    D. Ferdinand Cohn
    E. Antonie van Leeuwenhoek

38. Which of the following is the correct way to type the scientific name of this bacterium?
    A. Staph Aureus
    B. Staphylococcus Aureus
    C. *Staphylococcus aureus*
    D. Staphylococcus Aureus
    E. S. Aureus

39. Where are you most likely to find bacteria belonging to the domain Archaea?
    A. a human's large intestine
    B. in a hot spring
    C. a pond
    D. a sewage treatment plant
    E. a beer production facility

40. 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.

41. Which of the following diseases probably involves microbial infection?
    A. gastric ulcers
    B. female infertility
    C. coronary artery disease
    D. cervical cancer
    E. All of the choices are correct.

42. 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. This use of bacteria is a good example of ____.
    A. Bioremediation
    B. Immunology
    C. Astromicrobiology
    D. British physiology
    E. Epidemiology

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

44. Bacteria and fungi are important in bioremediation. These decomposers are also called ___.
    A. Strict aerobes
    B. Strict anaerobes
    C. Saprobes
    D. Predators
    E. Parasites

45. Members of the same species share many more characteristics compared to those shared by members of the same kingdom.

    True False

46. Viruses are not classified in any of Whittaker's 5 kingdoms.
True False

47. Members of the kingdom Fungi are photosynthetic.
True False

48. A scientist studying helminths is working with bacteria.
True False

49. The fossil record has established that prokaryotes existed on earth for approximately 2 billion years before eukaryotes appeared.
True False

50. It has been over 25 years since a new infectious disease has emerged in the world.
True False

51. The term sterile means free of all life forms.
True False

52. All microorganisms are parasites.
True False

53. During a scientific experiment, the control group is used to directly test or measure the consequences of a variable in the study.
True False

54. The scientific method involves formulating a tentative explanation, called the hypothesis, to account for what has been observed or measured.
True False

55. Once an organism is assigned to a particular taxonomic hierarchy, it is permanent and cannot be revised.

True False

56. A hypothesis must be tested before it can be considered a theory.
True False

57. The names of the three proposed Domains are: Bacteria, Protista, Eukarya.
True False

58. One distinguishing characteristic of the archaebacteria is that they live in extreme environments.
True False

59. The scientific field called _____ is involved in the identification, classification, and naming of organisms.

_____

60. _____ is the area of biology that states that living things undergo gradual structural and functional changes over long periods of time.

_____

61. Living things ordinarily too small to be seen with the unaided eye are termed _____.

_____

62. _____ are the group of microorganisms composed only of hereditary material wrapped in a protein covering.

_____

63. A scientist that constructs a hypothesis and then tests its validity by outlining predicted events of the hypothesis followed by experiments to test for those events is using the _____ approach.

_____

64. Discuss what might be three different beneficial consequences and three different detrimental consequences of killing all microorganisms on the earth.

65. Discuss five of the reasons why infectious diseases are increasing in number around the world.

66. Describe the experiment that Louis Pasteur did with swan-necked-shaped tubes to disprove spontaneous generation.

ch01 Key

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

37. D

38. C

39. B

40. A

41. E

42. A

43. D

44. C

45. TRUE

46. TRUE

47. FALSE

48. FALSE

49. TRUE

50. FALSE

51. TRUE

52. FALSE

53. FALSE

54. TRUE

55. FALSE

56. TRUE

57. FALSE

58. TRUE

59. taxonomy

60. Evolution

61. microorganisms

62. Viruses

63. deductive

64.

65.

66.

ch01 Summary

Category	*# of Questions*
ASM Objective: 01.01 Cells, organelles (e.g., mitochondria and chloroplasts) and all major metabolic pathways evolved from early prokaryotic cells.	1
ASM Objective: 01.04 The traditional concept of species is not readily applicable to microbes due to asexual reproduction and the frequent occurrence of horizontal gene transfer.	1
ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.	18
ASM Objective: 02.01 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).	5
ASM Objective: 02.02 Bacteria have unique cell structures that can be targets for antibiotics, immunity, and phage infection.	1
ASM Objective: 02.03 Bacteria and Archaea have specialized structures (e.g., flagella, endospores, and pili) that often confer critical capabilities.	2
ASM Objective: 02.04 While microscopic eukaryotes (for example, fungi, protozoa, and algae) carry out some of the same processes as bacteria, many of the cellular properties are fundamentally different.	6
ASM Objective: 02.05 The replication cycles of viruses (lytic and lysogenic) differ among viruses and are determined by their unique structures and genomes.	2
ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g., nitrogen fixation, methane production, anoxygenic photosynthesis).	2
ASM Objective: 03.02 The interactions of microorganisms among themselves and with their environment are determined by their metabolic abilities (e.g., quorum sensing, oxygen consumption, nitrogen transformations).	5
ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.	1
ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, or biological means.	3
ASM Objective: 04.04 The synthesis of viral genetic material and proteins is dependent on host cells.	1
ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.	1
ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.	3
ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.	5
ASM Objective: 05.04 Microorganisms, cellular and viral, can interact with both human and nonhuman hosts in beneficial, neutral or detrimental ways.	16
ASM Objective: 06.01 Microbes are essential for life as we know it and the processes that support life (e.g., in biogeochemical cycles and plant and/or animal microflora).	3
ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.	4
ASM Objective: 07.01a Ability to apply the process of science: Demonstrate an ability to formulate hypotheses and design experiments based on the scientific method.	6
ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods and apply these methods to analogous situations.	1
ASM Objective: 07.03a Ability to communicate and collaborate with other disciplines: Effectively communicate fundamental concepts of microbiology in written and oral format.	2
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).	2
ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).	1
ASM Topic: Module 01 Evolution	19
ASM Topic: Module 02 Structure and Function	12
ASM Topic: Module 03 Metabolic Pathways	9
ASM Topic: Module 04 Information Flow	1
ASM Topic: Module 05 Systems	22
ASM Topic: Module 06 Impact of Microorganisms	7
ASM Topic: Module 07 Scientific Thinking	9
ASM Topic: Module 08 Microbiology Skills	3
General Viral Properties	1
Learning Outcome: 01.01 Define microbiology and microorganisms, and identify the major organisms included in the science of microbiology.	11
Learning Outcome: 01.02 Name and define the primary areas included in microbiological studies.	4
Learning Outcome: 01.03 Describe the basic characteristics of prokaryotic cells and eukaryotic cells and their evolutionary origins.	4
Learning Outcome: 01.04 State several ways that microbes are involved in the earths ecosystems.	6
Learning Outcome: 01.05 Describe the cellular makeup of microorganisms and their size range, and indicate how viruses differ from cellular microbes.	4
Learning Outcome: 01.06 Discuss the ways microorganisms can be used to create solutions for environmental problems and industrial products.	5

Learning Outcome: 01.07 Review the roles of microorganisms as parasites and pathogens that cause infection and disease.	9
Learning Outcome: 01.08 Define what is meant by emerging and reemerging diseases.	3
Learning Outcome: 01.09 Outline the major events in the history of microbiology, including the major contributors to the early development of microscopy, medical advances, aseptic techniques, and the germ theory of disease.	8
Learning Outcome: 01.10 Explain the main features of the scientific method, and differentiate between inductive and deductive reasoning and between hypothesis and theory.	6
Learning Outcome: 01.11 Define taxonomy and its supporting terms classification, nomenclature, and identification.	4
Learning Outcome: 01.12 Explain how the levels of a taxonomic scheme relate to each other. Give the names of the levels, and place them in a hierarchy.	6
Learning Outcome: 01.13 Describe the goals of nomenclature and how the binomial system is structured. Know how to correctly write a scientific name.	5
Learning Outcome: 01.14 Discuss the fundamentals of evolution, evidence used to verify evolutionary trends, and its use in studying organisms.	4
Learning Outcome: 01.15 Explain the concepts behind the organization of the two main trees of life, and indicate where the major groups of microorganisms fall on these trees.	4
Learning Outcome: 01.16 Explain the bases for classification, taxonomy, and nomenclature.	5
Learning Outcome: 01.17 Recall the order of taxa and the system of notation used in creating scientific name	1
Talaro - Chapter 01	66
Topic: Basics of Genetic Engineering	1
Topic: Cellular Organization	2
Topic: Epidemiology	2
Topic: Food Microbiology	1
Topic: Helminths	2
Topic: History of Microbiology	13
Topic: Hypersensitivities	1
Topic: Microbial Roles	21
Topic: Recombinant DNA Technology	1
Topic: Taxonomy of Microorganisms	27
Topic: Viral structure	1