

***Microbiology: An Introduction, 14e* (Tortora et al.)**
Chapter 1 The Microbial World and You

1.1 Multiple-Choice Questions

1) Microorganisms play an important role in each of the following processes **except**:

- A) Causing infection
- B) Decomposing organic material
- C) O₂ production
- D) Food production
- E) Air pollution

Answer: E

Section: 1.1

Bloom's Taxonomy: Recall

Learning Outcome: 1.1

Global Outcome: 5

2) Organisms below are microbes **except**:

- A) *Saccharomyces*
- B) *Plasmodium*
- C) *E. coli*
- D) *Methanogens*
- E) HIV

Answer: E

Section: 1.1

Bloom's Taxonomy: Recall

Learning Outcome: 1.4

3) Disease-causing microorganisms are called _____.

- A) microbes
- B) bacteria
- C) COVID-19
- D) pathogens
- E) infection

Answer: D

Section: 1.1

Bloom's Taxonomy: Recall

Learning Outcome: 1.1

4) Common commercial benefits of microorganisms include synthesis of _____.

- A) riboflavin
- B) acetone
- C) insulin
- D) ethanol
- E) all of the above

Answer: E

Section: 1.1

Bloom's Taxonomy: Recall

ASMcue Outcome: 6.3

Learning Outcome: 1.1

5) The factors that contribute to the rising incidence of antibiotic resistance include:

- A) overuse and misuse of antibiotics.
- B) agricultural use of antibiotics.
- C) random mutations in bacterial genomes.
- D) global travel and trade.
- E) all of the above.

Answer: E

Section: 1.5

Bloom's Taxonomy: Understanding

ASMcue Outcome: 4.1

Learning Outcome: 1.19

Global Outcome: 5

6) The formal system for classifying and naming organisms was developed by _____.

- A) Robert Koch
- B) Louis Pasteur
- C) Aristotle
- D) Carolus Linnaeus
- E) None of the above

Answer: D

Section: 1.2

Bloom's Taxonomy: Recall

Learning Outcome: 1.3

7) In the name *Staphylococcus aureus*, *Staphylococcus* is the _____ and *aureus* is the _____.

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

Answer: A

Section: 1.2

Bloom's Taxonomy: Understanding

Learning Outcome: 1.3

8) A prokaryotic cell may possess all of the following **except**:

- A) Flagella
- B) A nucleus
- C) Ribosomes
- D) A cell wall
- E) A cell membrane

Answer: B

Section: 1.2

Bloom's Taxonomy: Recall

ASMcue Outcome: 2.1

Learning Outcome: 1.4

9) Which of the following does **not** belong to viruses?

- A) Organelles
- B) Nucleic acid
- C) Envelope
- D) Capsid
- E) Protein coat

Answer: A

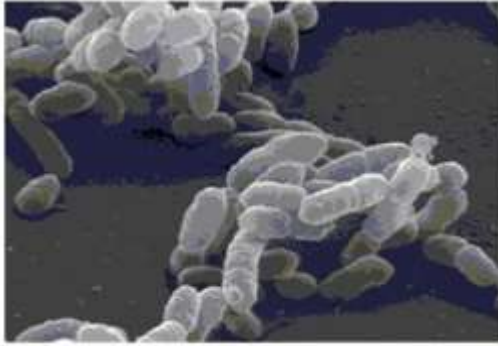
Section: 1.2

Bloom's Taxonomy: Understanding

ASMcue Outcome: 2.1

Learning Outcome: 1.4

10) Figure 1.1



The bacterial shape of the cells in the scanning electron micrograph shown in Figure 1.1 would best be described as _____.

- A) bacillus
- B) spiral
- C) coccus
- D) ovoid
- E) columnar

Answer: A

Section: 1.2

Bloom's Taxonomy: Understanding

ASMcue Outcome: 2.1

Learning Outcome: 1.4

11) Structures that allow extensive motility in protozoans include _____.

- A) cilia
- B) flagella
- C) pseudopods
- D) cilia and pseudopods only
- E) cilia, flagella, and pseudopods

Answer: E

Section: 1.2

Bloom's Taxonomy: Recall

Learning Outcome: 1.4

12) Viruses are not considered living because they _____.

- A) cannot reproduce
- B) are structurally very simple
- C) can only be visualized using an electron microscope
- D) are typically associated with disease
- E) are ubiquitous in nature

Answer: A

Section: 1.2

Bloom's Taxonomy: Recall

ASMcue Outcome: 4.4

Learning Outcome: 1.4

13) Microbes that naturally and mutualistically live in the human body and provide protection and production of essential vitamins and other compounds are called the _____.

- A) transient microbiota
- B) pathogenic microorganisms
- C) normal microbiota
- D) virulent microorganisms
- E) opportunistic microbiota

Answer: C

Section: 1.1

Bloom's Taxonomy: Recall

ASMcue Outcome: 5.4

Learning Outcome: 1.2

14) _____ do not belong to the three domains of life.

- A) Viruses
- B) Archaea
- C) Bacteria
- D) Eukarya

Answer: A

Section: 1.2

Bloom's Taxonomy: Recall

ASMcue Outcome: 1.5

Learning Outcome: 1.5

15) The classification system that categorizes all life forms into three domains based on their cellular structures was devised by whom?

- A) Carolus Linnaeus
- B) Anton van Leewenhoek
- C) Carl Woese
- D) Louis Pasteur
- E) Robert Koch

Answer: C

Section: 1.2

Bloom's Taxonomy: Recall

ASMcue Outcome: 1.5

Learning Outcome: 1.5

16) Archaea differ from bacteria in that archaea _____.

- A) have cell walls composed of pseudomurein
- B) lack of true nuclei
- C) use organic compounds for food
- D) reproduce by binary fission
- E) are prokaryotic

Answer: A

Section: 1.2

Bloom's Taxonomy: Recall

ASMcue Outcome: 2.3

Learning Outcome: 1.4

17) _____ is credited with first observing cells.

- A) Robert Hooke
- B) Anton van Leeuwenhoek
- C) Robert Koch
- D) Louis Pasteur
- E) Carolus Linnaeus

Answer: A

Section: 1.3

Bloom's Taxonomy: Recall

ASMcue Outcome: 2.1

Learning Outcome: 1.6

18) _____ is credited with first observing microorganisms.

- A) Robert Hooke
- B) Anton van Leeuwenhoek
- C) Robert Koch
- D) Louis Pasteur
- E) Carolus Linnaeus

Answer: B

Section: 1.3

Bloom's Taxonomy: Recall

ASMcue Outcome: 2.1

Learning Outcome: 1.6

19) Biogenesis refers to the _____.

- A) spontaneous generation of organisms from nonliving matter
- B) life forms from preexisting life
- C) development of aseptic technique
- D) germ theory of disease

Answer: B

Section: 1.3

Bloom's Taxonomy: Recall

Learning Outcome: 1.7

20) If you were setting up an experiment to disprove spontaneous generation theory in a liquid medium, which of the following would be essential to the experiment?

- A) Supplying the liquid with nutrients
- B) Starting with a liquid that contains microorganisms
- C) Adding antibiotics to the liquid
- D) Using a sterile liquid and preventing exposure to microorganisms
- E) Adding carbon dioxide to the liquid

Answer: D

Section: 1.3

Bloom's Taxonomy: Understanding

ASMcue Outcome: 7.1

Learning Outcome: 1.7

21) The arguments supporting spontaneous generation theory were finally disproved by _____.

- A) Louis Pasteur
- B) Francesco Redi
- C) Rudolf Virchow
- D) John Needham
- E) Lazzaro Spallanzani

Answer: A

Section: 1.3

Bloom's Taxonomy: Recall

Learning Outcome: 1.8

22) Regarding Louis Pasteur's experiments with the S-neck flask, which of the following statements is true?

- A) Air exchange was involved.
- B) A food source was provided.
- C) The possibility of contamination was removed.
- D) All preexisting microorganisms were killed.
- E) Air exchange occurred, a food source was provided, preexisting microorganisms were killed and contamination was prevented.

Answer: E

Section: 1.3

Bloom's Taxonomy: Understanding

ASMcue Outcome: 7.2

Learning Outcome: 1.8

23) The microbial metabolic process of converting sugars to alcohol is known as _____.

- A) fermentation
- B) pasteurization
- C) tyndallization
- D) lyophilization
- E) alcoholism

Answer: A

Section: 1.3

Bloom's Taxonomy: Recall

ASMcue Outcome: 3.1

Learning Outcome: 1.8

24) The concept that a microbe could cause disease was established by whom?

- A) Louis Pasteur
- B) Joseph Lister
- C) Robert Koch
- D) August Paul von Wasserman
- E) Ignaz Semmelweis

Answer: C

Section: 1.3

Bloom's Taxonomy: Recall

ASMcue Outcome: 5.4

Learning Outcome: 1.10

25) _____ used phenol as a wound disinfectant.

- A) Joseph Lister
- B) Ignaz Semmelweis
- C) Louis Pasteur
- D) Jonh Snow
- E) Robert Koch

Answer: A

Section: 1.3

Bloom's Taxonomy: Recall

ASMcue Outcome: 3.4

Learning Outcome: 1.9

26) Mycology is the study of _____.

- A) fungi
- B) bacteria
- C) plants
- D) protists
- E) animals

Answer: A

Section: 1.3

Bloom's Taxonomy: Recall

Learning Outcome: 1.13

27) _____ discovered that a bacterium causes anthrax and provided the experimental steps to demonstrate that a specific microbe causes a specific disease. These experimental steps are call the _____.

- A) Robert Koch, Koch's postulates
- B) Louis Pasteur, Pasteur's postulates
- C) Robert Koch, Pasteur's postulates
- D) Louis Pasteur, Koch's postulates
- E) All of the above

Answer: A

Section: 1.3

Bloom's Taxonomy: Recall

ASMcue Outcome: 5.4

Learning Outcome: 1.10

28) The protection from diseases is called _____.

- A) vaccination
- B) natural protection
- C) immunity
- D) all of the above
- E) none of the above

Answer: C

Section: 1.10

Bloom's Taxonomy: Recall

ASMcue Outcome: 5.4

Learning Outcome: 1.11

29) Edward Jenner inoculated a person with cowpox virus, who was then immune from _____.

- A) smallpox
- B) anthrax
- C) diphtheria
- D) AIDS
- E) rabies

Answer: A

Section: 1.10

Bloom's Taxonomy: Recall

ASMcue Outcome: 5.4

Learning Outcome: 1.11

30) Treatment of disease with chemicals is called _____.

- A) chemo
- B) medication
- C) antimicrobial therapy
- D) chemotherapy
- E) all of the above

Answer: D

Section: 1.4

Bloom's Taxonomy: Recall

ASMcue Outcome: 6.3

Learning Outcome: 1.11

31) Which of the following findings was essential for Edward Jenner's vaccination process?

- A) Exposure to a pathogen may induce immunity.
- B) A weakened microorganism will not cause disease.
- C) Someone who recovers from a disease will not acquire that disease again.
- D) Disease is caused by viruses.
- E) Pathogenic microorganisms infect all humans and animals in the same manner.

Answer: A

Section: 1.3

Bloom's Taxonomy: Understanding

ASMcue Outcome: 6.3

Learning Outcome: 1.11

32) _____, the first antibiotic, was discovered following an accident by _____.

- A) Penicillin, Alexander Fleming
- B) Penicillin, Paul Ehrlich
- C) Penicillin, Edward Jenner
- D) Penicillin, Robert Koch
- E) Penicillin, Joseph Lister

Answer: A

Section: 1.5

Bloom's Taxonomy: Recall

ASMcue Outcome: 3.4

Learning Outcome: 1.12

33) The first synthetic drugs are _____.

- A) salvarsan
- B) penicillin
- C) sulfonamides
- D) A and B
- E) A and C

Answer: E

Section: 1.3

Bloom's Taxonomy: Recall

ASMcue Outcome: 3.4

Learning Outcome: 1.12

34) Fungi are studied by _____.

- A) virologists
- B) bacteriologists
- C) parasitologists
- D) mycologists
- E) herpetologists

Answer: D

Section: 1.3

Bloom's Taxonomy: Recall

ASMcue Outcome: 5.4

Learning Outcome: 1.13

35) Recombinant DNA technology refers to the _____.

- A) study of bacterial ribosomes
- B) study of the function of genes
- C) interaction between human and bacterial cells
- D) synthesis of proteins from genes
- E) DNA made from two different sources

Answer: E

Section: 1.3

Bloom's Taxonomy: Recall

ASMcue Outcome: 4.5

Learning Outcome: 1.14

36) Molecular biology includes the study of _____.

- A) DNA replication
- B) transcription
- C) translation
- D) regulation of gene expression
- E) all of the above

Answer: E

Section: 1.3

Bloom's Taxonomy: Understanding

ASMcue Outcome: 4.2

Learning Outcome: 1.14

37) Microorganisms are essential to our life. The following are some examples of benefits **except:**

- A) Alternative fuel production
- B) Bioremediation
- C) Gene therapy
- D) Agriculture
- E) Robotic production

Answer: E

Section: 1.4

Bloom's Taxonomy: Recall

ASMcue Outcome: 6.3

Learning Outcome: 1.15

Global Outcome: 5

38) The major food producers for other living organisms is/are _____.

- A) plants
- B) cyanobacteria
- C) algae
- D) all of the above
- E) none of the above

Answer: D

Section: 1.4

Bloom's Taxonomy: Recall

ASMcue Outcome: 6.1

Learning Outcome: 1.15

39) Recombinant DNA technology can apply in all **except**:

- A) Vaccine production
- B) Gene therapy
- C) Hormone synthesis
- D) Drug production
- E) Cloning humans

Answer: E

Section: 1.4

Bloom's Taxonomy: Recall

ASMcue Outcome: 6.3

Learning Outcome: 1.16

40) Which statement below is **false** about normal microbiota?

- A) Normal microbiota colonize the body permanently.
- B) Normal microbiota provide protection.
- C) Normal microbiota cannot cause diseases.
- D) Normal microbiota can provide essential vitamins and antimicrobial compounds.
- E) Normal microbiota is distinct from person to person.

Answer: C

Section: 1.1

Bloom's Taxonomy: Understanding

ASMcue Outcome: 5.4

Learning Outcome: 1.2

41) Which of the following statements about biofilms is **false**?

- A) Biofilms are more sensitive to antibiotics.
- B) Biofilms in pipes can block the flow of water.
- C) Biofilms in your body protect mucous membranes from harmful microbes.
- D) Biofilms on medical devices cause infections.
- E) Biofilms on rocks provide food for animal life.

Answer: A

Section: 1.5

Bloom's Taxonomy: Recall

ASMcue Outcome: 6.1

Learning Outcome: 1.18

42) Development of emerging infectious disease can be a result of the following **except**:

- A) Microbial mutation
- B) Modern transportation
- C) Vaccination of COVID-19
- D) Changes in the environment
- E) Overuse of antibiotics

Answer: C

Section: 1.5

Bloom's Taxonomy: Understanding

ASMcue Outcome: 1.3

Learning Outcome: 1.19

43) All of the following are true concerning emerging infectious diseases **except**:

- A) They always involve sporadic cases in endemic areas.
- B) They include newly described infectious agents.
- C) Known pathogens develop variants such as SARS-CoV-2 and COVID-19.
- D) Known diseases spread to new regions or populations.
- E) They result from human exposure to a pathogen due to ecological changes.

Answer: A

Section: 1.5

Bloom's Taxonomy: Understanding

ASMcue Outcome: 1.3

Learning Outcome: 1.19

44) Which disease below is **not** categorized as an emerging infectious disease?

- A) HIV/AIDS
- B) Bovine spongiform encephalopathy
- C) Parkinson's disease
- D) Ebola hemorrhagic fever (EHF)
- E) Monkeypox

Answer: C

Section: 1.5

Bloom's Taxonomy: Understanding

ASMcue Outcome: 1.3

Learning Outcome: 1.19

45) The below are examples of a biofilm **except**:

- A) Archaea as part of the plankton community in the open ocean
- B) Dental plaque
- C) Vegetations on a patient heart valve
- D) Slimy layer on riverbed rocks
- E) Infection of a patient catheter

Answer: A

Section: 1.5

Bloom's Taxonomy: Understanding

ASMcue Outcome: 5.2

Learning Outcome: 1.18

1.2 True/False Questions

1) Infectious disease is almost totally eradicated in our world.

- A) True
- B) False

Answer: B

Section: 1.5

Bloom's Taxonomy: Remembering

ASMcue Outcome: 5.4

Learning Outcome: 1.19

2) A student has obtained a sample of pond water for study. Using the high-power objective lens from a light microscope, he observes several cells with nuclei. He concludes that the cells are **not** bacteria.

- A) True
- B) False

Answer: A

Section: 1.2

Bloom's Taxonomy: Understanding

ASMcue Outcome: 2.1

Learning Outcome: 1.4

3) Pasteurization is the process of removing most food spoilage causing pathogens by utilizing high temperature to kill all microorganisms present.

- A) True
- B) False

Answer: B

Section: 1.3

Bloom's Taxonomy: Understanding

ASMcue Outcome: 3.4

Learning Outcome: 1.8

Global Outcome: 5

4) Anton van Leeuwenhoek was the first microbiologist to use a microscope to examine environmental samples for the presence of microorganisms.

A) True

B) False

Answer: A

Section: 1.3

Bloom's Taxonomy: Recall

ASMcue Outcome: 2.1

Learning Outcome: 1.6

5) Spontaneous generation theory refers to living cells arising from preexisting cells.

A) True

B) False

Answer: B

Section: 1.3

Bloom's Taxonomy: Recall

Learning Outcome: 1.7

6) Most microbes are dangerous.

A) True

B) False

Answer: B

Section: 1.1

Bloom's Taxonomy: Recall

ASMcue Outcome: 5.4

Learning Outcome: 1.1

7) All cells possess a cell wall.

A) True

B) False

Answer: B

Section: 1.2

Bloom's Taxonomy: Recall

ASMcue Outcome: 2.1

Learning Outcome: 1.4

8) All pathogens known to infect humans have been identified.

A) True

B) False

Answer: B

Section: 1.5

Bloom's Taxonomy: Recall

ASMcue Outcome: 1.3

Learning Outcome: 1.19

9) The first antibiotic was discovered by Paul Ehrlich.

A) True

B) False

Answer: B

Section: 1.3

Bloom's Taxonomy: Recall

ASMcue Outcome: 6.3

Learning Outcome: 1.12

10) Enzymes from *Bacillus* and some other microbes can be used to remove stains on clothing.

A) True

B) False

Answer: A

Section: 1.4

Bloom's Taxonomy: Recall

ASMcue Outcome: 6.3

Learning Outcome: 1.15

11) Missing or defective genes in human cells can be replaced in gene therapy.

A) True

B) False

Answer: A

Section: 1.4

Bloom's Taxonomy: Recall

ASMcue Outcome: 6.3

Learning Outcome: 1.16

12) Emerging infectious diseases (EIDs) are new diseases and diseases increasing in incidence.

A) True

B) False

Answer: A

Section: 1.5

Bloom's Taxonomy: Recall

Learning Outcome: 1.19

13) Resistance factors include skin, stomach acid, antimicrobial chemicals, and surgery.

A) True

B) False

Answer: B

Section: 1.4

Bloom's Taxonomy: Understanding

ASMcue Outcome: 5.4

Learning Outcome: 1.17

14) Zika virus, COVID-19, Ebola virus, and small pox virus are examples of emerging infectious pathogens.

A) True

B) False

Answer: B

Section: 1.5

Bloom's Taxonomy: Understanding

ASMcue Outcome: 1.3

Learning Outcome: 1.19

1.3 Essay Questions

1) List and describe an emerging infectious disease that you know. What are some possible causes of this emerging infectious disease?

Section: 1.5

Bloom's Taxonomy: Understanding

ASMcue Outcome: 1.3

Learning Outcome: 1.19

Global Outcome: 8

2) Differentiate prokaryotic and eukaryotic cells based on the cell structures, metabolism, habitats, and reproductions.

Section: 1.2

Bloom's Taxonomy: Analyzing

ASMcue Outcome: 2.4

Learning Outcome: 1.4

Global Outcome: 8

3) Describe the function and the importance of S-necked flasks in Louis Pasteur's experiments in disproving spontaneous generation theory?

Section: 1.3

Bloom's Taxonomy: Understanding

Learning Outcome: 1.8

Global Outcome: 5

4) Explain the germ theory of disease and discuss why this theory is important.

Section: 1.3

Bloom's Taxonomy: Evaluating

ASMcue Outcome: 5.4

Learning Outcome: 1.9

Global Outcome: 5

5) Explain the concepts of normal microbiota and transient microbiota and discuss the effect of their pathogenicity.

Section: 1.1

Bloom's Taxonomy: Evaluating

ASMcue Outcome: 5.4

Learning Outcome: 1.2

Global Outcome: 8