Student name:\_\_\_\_\_\_\_\_\_\_

1. Microorganisms are best defined as organisms that

cause human disease.

lack a cell nucleus.

are infectious particles.

are too small to be seen with the unaided eye.

can only be found growing in laboratories.

1. Which of the following are not considered microorganisms?

Mosquitoes

Protozoa

Bacteria

Viruses

Fungi

1. Helminths are

bacteria.

protozoa.

molds.

parasitic worms.

infectious particles.

1. Among these types of microorganisms, the\_\_\_\_\_\_\_\_\_\_ are noncellular.

viruses

helminths

protozoans

bacteria

1. Studies of the immune response to an infection caused by microorganisms would be performed by a/an

hypersensitivity specialist.

epidemiologist.

immunologist.

geomicrobiologist.

1. Which of the following pairs of career descriptions and work tasks is not correctly matched?

Industrial microbiologist -- manipulate bacterial strains to be less pathogenic

Agricultural microbiologist -- identify bacterial causes of crop disease

Public health microbiologist -- track the incidence of AIDS in a population

Medical microbiologist -- identify the cause of a bladder infection at a hospital lab

1. A scientist who studies the influence of microbes in the formation of caves is called a/an

geomicrobiologist.

astrobiologist.

epidemiologist.

immunologist.

1. Astrobiology is considered a sub-discipline of microbiology because

life elsewhere in the universe is likely to be microbial.

microbes are known to exist on other planets.

all extraterrestrials known are microbial.

only microbes can reproduce under the extreme conditions in outer space.

1. Which of the following does not indicate microbe involvement in energy and nutrient flow?

Thermal hot springs warmed by heat from earth's interior

Formation of greenhouse gases,and methane

Digestion of complex carbohydrates in animal diets

Decomposition of dead matter and wastes

1. The microorganisms that recycle nutrients by breaking down dead matter and wastes are called

decomposers.

prokaryotes.

pathogens.

eukaryotes.

fermenters.

1. The majority of oxygen in earth's atmosphere is a product of photosynthesis by

microorganisms.

rain forests.

agricultural lands.

green plants.

1. The three cell types discussed, eukaryotes, archaea, and bacteria, all derived from

a common ancestral cell.

photosynthetic bacteria.

archaea.

cells with a true nucleus.

1. The first cells appeared about\_\_\_\_\_\_\_\_\_\_ billion years ago.

5

4

3.5

2

1

1. A hypothesis must be tested many times before it can be considered a theory.
* true
* false

1. Which area of biology states that living things undergo gradual structural and functional changes over long periods of time?

Morphology

Phylogeny

Evolution

Genetics

Transformation

1. When humans manipulate the genes of microorganisms, the process is called

bioremediation.

genetic engineering.

epidemiology.

immunology.

taxonomy.

1. Which activity is an example of biotechnology?

Bacteria in the soil secreting an antibiotic to kill competitors

A microbiologist using the microscope to view bacteria

Egyptians using moldy bread on wounds

*Escherichia coli* producing human insulin

Public health officials monitoring diseases in a community

1. Which of the following is a traditional human use of microorganisms?

Baking bread

Treating water and sewage

Mass-producing antibiotics

Cleaning up oil spills

1. Using microbes to detoxify a site contaminated with heavy metals is an example of

biotechnology.

bioremediation.

decomposition.

immunology.

epidemiology.

1. Disease-causing microorganisms are called

decomposers.

bacteria.

pathogens.

eukaryotes.

fermenters.

1. The number one worldwide infectious diseases are

AIDS-related diseases.

diarrheal diseases.

malaria and other protozoan diseases.

measles and other rash diseases.

respiratory diseases.

1. Many chronic medical conditions have been found to be associated with microbial agents.
* true
* false

1. The incidence of deaths from communicable disease is\_\_\_\_\_\_\_\_\_\_ in the United States compared to the entire world.

less

greater

about the same

1. In which way are bacteria and eukaryotes the same?

Contain membrane-bound organelles

Possess a cell membrane

Contain a nucleus to hold DNA

Always have a cell wall for rigidity

1. In which way are archaea and eukaryotes the same?

Contain membrane-bound organelles

Have similar ssu rRNA sequences

Contain mitochondria for energy production

Possess RNA instead of DNA

1. All bacteria and archaea are microorganisms, but only some eukaryotes are microorganisms.
* true
* false

1. Which of the following is a unique characteristic of viruses that distinguishes them from the other major groups of microorganisms?

Cause human disease

Lack a nucleus

Cannot be seen without a microscope

Contain genetic material

Lack cell structure

1. Which group of microorganisms is composed only of hereditary material wrapped in a protein covering?

Viruses

Bacteria

Parasites

Fungi

Yeasts

1. Eukaryotic cells are larger than bacterial or archaeal cells; all cells are larger than macromolecules. Where do viruses fit on this scale?

Viruses are larger than eukaryotic cells.

Viruses are smaller than eukaryotic cells, but larger than bacterial or archaeal cells.

Viruses are smaller than bacterial or archaeal cells, but larger than macromolecules.

Viruses are smaller than macromolecules.

1. In general, eukaryotic cells are about\_\_\_\_\_\_\_\_\_\_ times larger than bacterial or archaeal cells.

2

10

50

1000

1. Archaeal cells are about\_\_\_\_\_\_\_\_\_\_ bacterial cells.

the same size as

ten times larger than

ten times smaller than

1. Which of the following historical microbiologists is incorrectly paired with his contribution to the science?

Francesco Redi: tested spontaneous generation with meat exposed to the air or covered with cloth

Antonie van Leeuwenhoek: made and used quality magnifying lenses to observe and record microorganisms

Louis Pasteur: demonstrated that anthrax was caused by a bacterium

Joseph Lister: promoted disinfecting hands and air prior to surgery

1. In the experiments constructed by Pasteur to disprove spontaneous generation, swan-necked flasks were used. Why was this shape of flask used in this experiment?

The glass necks needed to be open to the air, yet constructed so that bacteria would settle in the lowest part of the neck.

These flask shapes were the easiest and cheapest to produce.

The shape of the glass neck allowed the bacteria into the flask and then into the media, but air could not enter.

Because the glass necks were stretched out, the heat used to sterilize the medium inside of the flask could not kill the bacteria in the neck.

1. Koch's postulates are criteria used to establish that

microbes are found on dust particles.

a specific microbe is the cause of a specific disease.

life forms can only arise from preexisting life forms.

a specific microbe should be classified in a specific kingdom.

microbes can be used to clean up toxic spills.

1. Which of the following is NOT a recent discovery that has had a huge impact on the understanding of microbiology?

Restriction enzymes

PCR technique

Human microbiome project

Small RNAs

All are significant discoveries.

1. The sum total of all the microbes in a certain environment is termed the

microbiome.

biofilm.

microbial niche.

domain.

phylogeny.

1. Which of the following is not a process in the scientific method?

Belief in a preconceived idea

Formulation of a hypothesis

Systematic observation

Laboratory experimentation

Development of a theory

1. Experimentation

is designed to refute an hypothesis.

is designed to support an hypothesis.

provides a means to gather subjective data.

provides a means to gather objective data.

is the first step in the scientific method.

1. The scientific method includes all of the following except

hypothesis.

experimentation.

observation.

publication.

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

1. Caring for patients infected with a new virus requires safety precautions for medical personnel. Choosing appropriate procedures is an example of a/an\_\_\_\_\_\_\_\_\_\_ process.

deductive

inductive

hypothetical

pathogenic

1. Sterile is best described as

pathogen-free.

absence of spores.

absence of any life forms and viral particles.

pasteurized.

homogenized.

1. Taxonomy does not involve

nomenclature.

classification.

identification.

a common name.

1. Which scientific field is involved in the identification, classification, and naming of organisms?

Nomenclature

Taxonomy

Phylogeny

Pathology

Epidemiology

1. The orderly arrangement of organisms into a hierarchy of taxa is called

classification.

identification.

nomenclature.

experimentation.

biotechnology.

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

1. Which of the following is a taxon that contains all the other taxa listed?

Species

Phylum

Kingdom

Genus

Family

1. The smallest and most significant taxon is a

genus.

species.

kingdom.

family.

phylum.

1. Select the correct descending taxonomic hierarchy (left to right).

Family, order, class

Family, genus, species

Genus, species, family

Class, phylum, order

Kingdom, domain, phylum

1. A mnemonic for remembering the taxonomic levels from Domain to Species is "Dear King Phillip Came Over for Good Soup." The word "came" here is a reminder of the taxonomic level of

class.

category.

chain.

colony.

culture.

1. Which of the following is a scientific name?

Gram-positive streptococcus

*Streptococcus pyogenes*

Anthrax

Streptobacilli

1. When assigning a scientific name to an organism,

the species name is capitalized.

the species name is placed first.

the species name can be abbreviated.

both genus and species names are capitalized.

both genus and species names are italicized or underlined.

1. Which scientific name is written correctly?

Staphylococcus aureus

staphylococcus aureus

Staphylococcus Aureus

*Staphylococcus aureus*

S. aureus

1. The names of the three proposed domains are: Bacteria, Protista, and Eukarya.
* true
* false

1. A diagram of the three domains (Bacteria, Archaea, Eukarya) proceeding from the Last Common Ancestor would show Archaea

as the original cells from which the others derived.

branching off the Domain Eukarya.

branching off the Domain Bacteria.

1. Analysis of the small subunit rRNAs from all organisms in the three current domains suggests that

the eukaryotes arose from prokaryotes.

the Archaea are more closely related to bacteria than eukaryotes.

all modern and extinct organisms on earth arose from a common ancestor.

bacteria, archaea, and eukaryotes are not related.

1. The study of evolutionary relationships among organisms is called

biotechnology.

genetics.

recombinant DNA.

phylogeny.

taxonomy.

1. A scientist studying the sequence of nucleotides in the rRNA of a bacterial species is working on

determining evolutionary relatedness.

bioremediation.

recombinant DNA.

nomenclature.

determining if that species is the cause of a new disease.

1. Trees of life that illustrate the phylogenetic relationships of all organisms were traditionally based on\_\_\_\_\_\_\_\_\_\_; newer methods for determining phylogeny rely on\_\_\_\_\_\_\_\_\_\_.

morphology; nucleic acid sequences

nucleic acid sequences; morphology

morphology; virology

morphology; nutritional requirements

nucleic acid sequences; microbiomes

1. Choose the term(s) identifying professions that involve the use of microorganisms.

The food industry

Biotechnology

Epidemiology

Astrology

Genetic engineering

Agriculture and dairy industries

1. Select all answers that are roles played by microorganisms in our environment.

Carry out photosynthesis

Biological decomposition

Nutrient recycling

Complex relationships with animals but not plants

1. Photosynthetic microorganisms contribute more oxygen to the atmosphere than plants.
* true
* false

1. The theory of evolution and the germ theory of disease are so called because

a single experiment was repeated with consistency many times for each theory, proving the original hypotheses to be true.

multiple experiments were designed and repeated to explain all aspects of the observed phenomena without disproving the original hypotheses.

individuals had ideas regarding observed phenomena, which both went untested.

multiple experiments were conducted; some proved the observed hypotheses and others disproved them.

1. Select statements that apply to the theory of evolution to test your understanding of evolution.

The theory has undergone years of testing.

The theory is a new untested hypothesis.

The theory has not been disproven.

The theory lacks supportive evidence.

The theory is a well-established natural phenomenon.

1. Choose the response(s) that pertain to the relative burden of human infectious diseases in the world today.

More than 2,000 microbes can cause human disease today.

The number of deaths from emerging and reemerging diseases is on the decline worldwide.

Many diseases that used to be considered noninfectious probably do involve microbial infection based upon current studies.

There is an increase in microbes that are resistant to drugs today.

Infectious diseases are more frequent in developed countries, whereas noncommunicable diseases are more common in developing countries.

1. Most microorganisms that are found in and on humans do not cause harm and can sometimes benefit the host.
* true
* false

1. Choose all of the responses that pertain to the relative burden of human infectious diseases in the world today.

Noncommunicable disease causes the highest percentage of deaths in both developing and developed countries.

Deaths due to communicable diseases are highest in low-income, developing countries.

Developed countries like the United States exhibit deaths only due to chronic disease.

The infectious diseases that cause the most deaths worldwide and in the United States are pneumonia and influenza.

HIV is the most concerning infectious disease worldwide.

1. Select the characteristic exhibited by viruses.

Independent living cellular organisms

Much more complex than cells

Composed of DNA and RNA

Parasitic particles

Lack a protein coat

1. All organisms studied in microbiology must be viewed with a microscope.
* true
* false

1. Choose the term that describes the overall system of discovering, arranging, and naming organisms.

Nomenclature

Identification

Classification

Taxonomy

Hierarchy

1. Select the three major areas involved in the science of taxonomy.

Classification

Genetics

Nomenclature

Analysis

Identification

1. Early taxonomists relied upon all of the following to classify an organism except

analysis of the organism's shape (morphology).

analysis of structural and organizational characteristics of the organism.

analysis of metabolic (nutritional) characteristics of the organism.

genetic analysis of the organism.

1. Which of the following choices is a correct way to type the binomial name of a microorganism?

*Staphylococcus aureus*

*Staphylococcus Aureus*

*staphylococcus Aureus*

*staphylococcus aureus*

Staphylococcus aureus

1. Choose the statement or characteristic that best describes the current taxonomic system.

Three distinct cell types called domains as the highest taxonomic category

Five kingdoms as the highest levels of taxonomy

Organisms divided first into groups of plants, animals, and microorganisms

First division is based on prokaryote vs eukaryote with all prokaryotes being very genetically distinct from the eukaryotes

1. Select all of the answers that reflect the contributions that molecular approaches have made to modern taxonomy.

Revealed that ssu RNA is highly conserved so can be used for classification

Have led to the development of a new taxonomic system divided into domains

Have not changed the overall tree of life

Revealed that archaea are more closely related to bacterial cells than eukaryotic cells

1. The major groups of microorganisms studied by microbiologists include bacteria and archaea, algae, helminths, protozoans, viruses, and

cysts.

spores.

fungi.

arthropods.

1. The scientific name of a microorganism is a combination of the\_\_\_\_\_\_\_\_\_\_ name, which is capitalized, followed by the\_\_\_\_\_\_\_\_\_\_ name, which begins with a lowercase letter.

species; genus

phylum; genus

genus; species

genus; kingdom

1. The scientific method is used by scientists to explain a certain natural phenomenon, and it involves the formation of a\_\_\_\_\_\_\_\_\_\_ as a tentative explanation of the observed or measured phenomenon.

theory

variable

hypothesis

experiment

1. Select the individual below that ground glass lenses to very fine specifications so that he was able to develop a microscope for observing and describing living microscopic animalcules.

Antonie van Leeuwenhoek

Ibn al-Haytham

Kary Mullis

Louis Pasteur

1. The theory of evolution was once a \_\_\_\_\_\_\_\_\_\_ that was tested repeatedly and always supported by the data collected by various scientists around the world.

theorem

hypothesis

fact

variable

1. Which of the following are true regarding spontaneous generation? Check all that apply.

It was definitively disproven by Francesco Redi.

Louis Pasteur designed an experiment with swan-necked flasks that disproved this theory once and for all.

This theory was based on idea of abiogenesis.

The meat maggot experiment indicated that the concept of abiogenesis was likely true.

1. Which example represents deductive reasoning?

Having read that refined sugar can lead to disease, you choose not to eat a doughnut at breakfast this morning.

You measure your gas mileage for a tank of gas over five different tanks. When you average over 60 mph for the tank, you get less than 300 miles to the tank. When you average 30 mph for the tank, you get over 500 miles. You conclude that driving faster burns gas more quickly.

Every time you eat cereal or drink a glass of milk, you experience severe abdominal pain. You conclude that you could possibly have lactose intolerance.

1. Dr. Wendall Holmes and Dr. Ignaz Semmelweis were pioneers in\_\_\_\_\_\_\_\_\_\_, one of the most important methods to reduce disease in healthcare settings.

sterilized operating rooms

handwashing

use of antiseptics on skin before surgery

pasteurization

**Answer Key**Test name: chapter 1

D

A

D

A

C

A

A

A

A

A

A

A

B

TRUE

C

B

D

A

B

C

E

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D

A

A

[A, B, C, E, F]

[A, B, C]

TRUE

B

[A, C, E]

[A, C, D]

TRUE

[A, B, D]

D

FALSE

D

[A, C, E]

D

A

A

[A, B]

C

C

C

A

B

[B, C]

A

B