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

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

bioremediation

genetic engineering

epidemiology

immunology

taxonomy

1. Which of the following is not considered a microorganism?

Mosquito

Protozoan

Bacterium

Virus

Fungus

1. All 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 activity is an example of biotechnology?

Bacteria in the soil secreting an antibiotic to kill competitors

A microbiologist using the microscope to study bacteria

Egyptians using moldy bread on wounds

*Escherichia coli* producing human insulin

Public health officials monitoring diseases in a community

1. Living things ordinarily too small to be seen with the unaided eye are termed\_\_\_\_\_\_\_\_\_.

bacteria

viruses

parasites

microorganisms

prokaryotes

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

decomposers

prokaryotes

pathogens

eukaryotes

fermenters

1. Cells, like bacteria and archaea, that do not have a nucleus in their cells have traditionally been called\_\_\_\_\_\_\_\_\_.

decomposers

prokaryotes

pathogens

eukaryotes

fermenters

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

5.2

4.6

3.8

2.9

1.5

1. Which of the following is not a human use of microorganisms?

Making bread

Treating water and sewage

Manufacturing copper wire

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

prokaryotes

pathogens

eukaryotes

fermenters

1. The most prevalent worldwide infectious diseases are\_\_\_\_\_\_\_\_\_.

AIDS-related diseases

diarrheal diseases

malaria diseases

measles

respiratory diseases

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. Helminths are\_\_\_\_\_\_\_\_\_.

bacteria

protozoa

molds

parasitic worms

infectious particles

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

Viruses

Bacteria

Parasites

Fungi

Helminths

1. Which statement correctly compares the sizes of different microorganisms?

Bacteria are larger than viruses

Bacteria are larger than eukaryotic microorganisms

Eukaryotic microorganisms are smaller than viruses

Archaea are larger than eukaryotic microorganisms but smaller than bacteria

1. The Dutch merchant who made and used quality magnifying lenses to see and record microorganisms was\_\_\_\_\_\_\_\_\_.

Francesco Redi

Antonie van Leeuwenhoek

Louis Pasteur

Joseph Lister

Robert Koch

1. The surgeon who advocated using disinfectants on hands and in the air prior to surgery was\_\_\_\_\_\_\_\_\_.

Joseph Lister

Ignaz Semmelweis

Robert Koch

Louis Pasteur

Antonie van Leeuwenhoek

1. Sterility refers to\_\_\_\_\_\_\_\_\_.

being pathogen free

having an absence of spores

having an absence of any life forms and viral particles

being pasteurized

being homogenized

1. Which scientist showed that anthrax was caused by the bacterium, *Bacillus anthracis?*

Joseph Lister

Ignaz Semmelweis

Robert Koch

Louis Pasteur

Antonie van Leeuwenhoek

1. If you were a microbiologist in 1950, which of the following scientific principles would you already know?

Aseptic techniques could reduce the number of wound infections in the surgical setting.

Biofilms can form on implanted objects in the human body and be responsible for infection.

Enzymes found in bacteria can be used to cut DNA.

Very little DNA is transcribed into RNA that is then translated into proteins.

1. Taxonomy does not involve\_\_\_\_\_\_\_\_\_.

nomenclature

classification

taxa

identification

common name

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

Nomenclature

Taxonomy

Phylogeny

Woesean classification

None of the choices are correct.

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

classification

identification

nomenclature

experimentation

biotechnology

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\_\_\_\_\_\_\_\_\_.

genus

species

kingdom

family

phylum

1. Select the correct descending taxonomic hierarchy:

family, order, class

family, genus, species

genus, species, family

class, phylum, order

kingdom, domain, phylum

1. Which of the following is a scientific name?

Gram-positive streptococcus

*Staphylococcus*

*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. The study of evolutionary relationships among organisms is called\_\_\_\_\_\_\_\_\_.

biotechnology

genetics

recombinant DNA

phylogeny

taxonomy

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

Morphology

Phylogeny

Evolution

Genetics

None of the choices is correct.

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. The scientist(s) who proposed organisms be assigned to one of three domains is(are) \_\_\_\_\_\_\_\_\_.

Robert Koch and Louis Pasteur

Antonie van Leeuwenhoek

Carl Woese and George Fox

Robert Whittaker

Francesco Redi

1. Which scientific name is written correctly?

*Staphylococcus aureus*

*staphylococcus aureus*

*Staphylococcus Aureus*

Staphylococcus aureus

STAPHYLOCOCCUS AUREUS

1. A scientist studying helminths is working with bacteria.
* true
* false

1. Current evidence indicates that bacteria and archaea existed on earth for approximately 2 billion years before eukaryotes appeared.
* true
* false

1. A scientific theory, like the theory of evolution, is just our best guess at explaining a scientific phenomenon, but a theory cannot be considered fact.
* true
* false

1. Many chronic conditions are found to be associated with microbial agents.
* true
* false

1. All microorganisms are considered pathogens.
* true
* false

1. The term *sterile* means free of all life forms.
* true
* false

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

1. Once an organism is assigned to a particular taxonomic hierarchy, it is permanent and cannot be revised.
* true
* false

1. Viruses are not classified in any of Whittaker's five kingdoms.
* true
* false

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

1. One distinguishing characteristic of the archaebacteria is that they live in extreme environments.
* true
* false

1. Microbes have been found existing in salty, acidic lakes.
* true
* false

1. Organic chemicals always have a basic framework of the element\_\_\_\_\_\_\_\_\_ bonded to other atoms.

carbon

nitrogen

oxygen

hydrogen

phosphorous

1. Most biochemical macromolecules are polymers, which are chains of\_\_\_\_\_\_\_\_\_.

hydrophobic molecules

electrolytic molecules

repeating monomers

repeating carbohydrates

hydrogen bonds

1. All of the following are monosaccharides except\_\_\_\_\_\_\_\_\_.

glucose

glycogen

fructose

ribose

deoxyribose

1. All of the following are polysaccharides except\_\_\_\_\_\_\_\_\_.

glycogen in liver and muscle

agar used to make solid culture media

a cell's glycocalyx

cellulose in certain cell walls

prostaglandins in inflammation

1. All of the following are lipids except\_\_\_\_\_\_\_\_\_.

cholesterol

starch

phospholipid

wax

triglyceride

1. What part of a phospholipid forms hydrophobic tails?

Fatty acids

Glycerol

Phosphate

Alcohol

All of the choices are correct.

1. A fat is called \_\_\_\_\_\_\_\_\_ if all carbons of the fatty acid chain are single bonded to two other carbons and two hydrogens.

unsaturated

polyunsaturated

monounsaturated

saturated

None of the choices are correct.

1. The lipid group that serves as energy storage molecules is\_\_\_\_\_\_\_\_\_.

prostaglandins

waxes

phospholipids

steroids

triglycerides

1. The lipid group that is the major component of cell membranes is the\_\_\_\_\_\_\_\_\_.

prostaglandins

waxes

phospholipids

steroids

triglycerides

1. The building blocks of an enzyme are\_\_\_\_\_\_\_\_\_.

nucleotides

glycerol and fatty acids

monosaccharides

phosphate, glycerol, and fatty acids

amino acids

1. Which is not true about enzymes?

They are found in all cells.

They are catalysts.

Their shape determines their function.

They can be denaturated by heat and other agents.

They have high-energy bonds between phosphates.

1. Which amino acid contains sulfur atoms that form covalent disulfide bonds in its tertiary structure?

Valine

Cysteine

Serine

Alanine

Tyrosine

1. What type of bonds are formed between adjacent amino acids?

Glycosilic

Ester

Peptide

Disulfide

Phosphate

1. The alpha helix is a type of\_\_\_\_\_\_\_\_\_ protein structure.

primary

secondary

tertiary

quaternary

None of the choices is correct.

1. One nucleotide contains\_\_\_\_\_\_\_\_\_.

one phosphate

one pentose sugar

one nitrogen base

All of the choices are correct

None of the choices are correct.

1. Which pertains to DNA but not to RNA?

Contains ribose

Contains adenine

Contains thymine

Contains uracil

Contains nucleotides

1. ATP is best described as\_\_\_\_\_\_\_\_\_.

an enzyme

a double helix

an electron carrier

the energy molecule of cells

All of the choices are correct.

1. You are trying to identify a chemical that consists of adenine, ribose, and three phosphates. What is this chemical?

DNA

RNA

ATP

Phospholipid

1. A student forgot to label a beaker containing a DNA solution and a beaker containing a glucose solution. If chemical analysis was performed to identify the contents of each beaker, which of the following would be found in the beaker of DNA but not in the beaker with glucose?

Amino acids

Hydrogen and oxygen atoms

Nitrogen and phosphorus

Fatty acids

Carbon atoms

1. Purines and pyrimidines are components in the building block units of all\_\_\_\_\_\_\_\_\_.

nucleic acids

carbohydrates

polysaccharides

amino acids

enzymes

1. Which of the following is not a pyrimidine?

Uracil

Adenine

Thymine

Cytosine

All of these are pyrimidines.

1. During protein synthesis,\_\_\_\_\_\_\_\_\_ RNA is made as a copy of a gene from DNA.

transfer

messenger

ribosomal

All of the choices are correct.

1. Characteristics shared by all cells include\_\_\_\_\_\_\_\_\_.

a membrane serving as a cell boundary

the possession of genetic information

the presence of cellular fluid

All of these choices are correct.

1. The purine\_\_\_\_\_\_\_\_\_ always binds with the pyrimidine\_\_\_\_\_\_\_\_\_ in DNA and RNA.

guanine; cytosine

cytosine; guanine

adenine; guanine

thymine; guanine

1. All proteins are enzymes.
* true
* false

1. The most important outcome of polypeptide intrachain bonding and folding is the unique shape of the protein.
* true
* false

1. Nucleic acids have primary, secondary, tertiary, and quaternary levels of organization.
* true
* false

1. Which of the following statements is correct regarding the relationship between humans and microbes?

The majority of microorganisms that colonize humans are pathogenic

Microorganisms are benefited from their colonization of humans, whereas humans are unaffected by the relationship

Humans are colonized by bacteria and fungi, but not viruses

Not only do the majority of colonizing bacteria cause no harm to humans, the relationship is beneficial for both microbe and human host

1. Which list correctly ranks the microorganisms from largest to smallest?

Zika virus, *Bacillus anthracis*, *Aspergillis sp*., Helminth

*Aspergillis sp*

*Bacillus anthracis*

*Bacillus anthracis*

*Aspergillis*

 *sp*

Helminth, *Aspergillis*  *sp*., *Bacillus anthracis*, Zika virus

Helminth, *Aspergillis*  *sp*., Zika virus, *Bacillus anthracis*

1. The Nobel Prize was awarded to Kary Mullis in 1993 for inventing what technique to amplify and subsequently analyze DNA?

Polymerase chain reaction

The central dogma of biology

Restriction enzyme analysis

Human microbiome project

Small RNA analysis

1. Which of the following statements correctly determines the process when following the scientific method?

Formulate question, conduct research, propose hypothesis, test hypothesis

Propose hypothesis, test hypothesis, formulate question, conduct research

Formulate question, propose hypothesis, test hypothesis, conduct research

Conduct research, formulate question, propose hypothesis, test hypothesis

1. If a hypothesis is accepted, then the findings become a scientific law.
* true
* false

1. The acceptance or rejection of a hypothesis is based on a series of educated guesses and opinions. Once the opinion is widely accepted it becomes a theory.
* true
* false

1. Which of the features listed below is *not* found in all cells?

Cytoplasmic membrane

Ribosomes

DNA

Nucleus

1. Despite the lack of a membrane-bound nucleus, bacteria and archaea are cells with a complex organizational structure.
* true
* false

1. Organisms were classified into kingdoms as they were defined. Which list reflects the order of discovery of the kingdoms as we know them today?

Monera, protista, fungi, plants and animals

Plants and animals, protista, monera, fungi

Fungi, monera, plants and animals, protista

Protista, fungi, monera, plants and animals

Monera, plants and animals, protista, fungi

1. Carl Woese and George Fox developed the three-domain system of taxonomy based on what molecular discovery?

Variations in the ribonucleic acid of the small ribosomal subunit of organisms

Mutations in enzyme proteins

Genetic analysis showing that bacteria and archaea are identical

Molecular analysis of genes showing that eukaryotes evolved from bacteria, and bacteria evolved from archaea

1. The major groups of microorganisms studied by microbiologists include\_\_\_\_\_\_\_\_\_.

bacteria

plants

helminths

algae

fungi

viruses

archaea

protozoa

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

Has undergone years of testing

Is a new untested hypothesis

Has not been disproven

Lacks supportive evidence

Is a well-established natural phenomenon

1. The term used to describe the broad field of science that involves human manipulation of microbes for use in industrial processes is\_\_\_\_\_\_\_\_\_.

biotechnology

bioremediation

recombinant DNA technology

biodegradation

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

1. The Dutch linen merchant\_\_\_\_\_\_\_\_\_ ground glass lenses to detailed specifications so that he was able to develop a microscope for observing and describing living microscopic animalcules.

Leeuwenhoek

Pasteur

Lister

Koch

1. Which of the following are correctly matched?

Bacteria—no nucleus

Bacteria—true nucleus

Archaea—true nucleus

Archaea—no nucleus

Eukaryotes—true nucleus

Eukaryotes—no nucleus

1. Select the characteristic that is exhibited by viruses.

Viruses are independent living cellular organisms.

Viruses are much more complex than cells.

Viruses are composed of both DNA and RNA.

Viruses are parasitic particles that invade host cells.

Viruses lack a protein coat.

1. Select the main groups of macromolecules found in living things.

Nucleic acids

Oxygen

Carbon dioxide

Lipids

Proteins

Carbohydrates

1. Alpha helices and beta pleated sheets are examples of\_\_\_\_\_\_\_\_\_ protein structure.

primary

secondary

tertiary

quaternary

1. Disulfide bonds are involved in maintaining\_\_\_\_\_\_\_\_\_ protein structure as well as the\_\_\_\_\_\_\_\_\_ level of protein structure exhibited by complex proteins such as antibodies.

tertiary; quaternary

quaternary; tertiary

secondary; quaternary

secondary; tertiary

primary; secondary

1. Select the nitrogenous bases found in nucleotides that make up RNA.

Guanine

Uracil

Thymine

Adenine

Cytosine

1. Select the nitrogenous bases found in nucleotides that make up DNA.

Guanine

Uracil

Thymine

Adenine

Cytosine

1. Select characteristics exhibited by all cells.

Cytoplasmic membrane

Nucleus

DNA

Ribosomes

Cell wall

Organelles

1. Select all areas that comprise the main aspects of the science of taxonomy.

Classification

Genetics

Nomenclature

Analysis

Identification

1. Choose the term that describes the formal system of identifying, arranging, and naming organisms.

Nomenclature

Identification

Classification

Taxonomy

Hierarchy

1. Which of the following choices is a correct way to denote 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 Woese-Fox taxonomic system to test your understanding of taxonomy.

Three distinct cell lines called domains

Five kingdoms

Plants, animals, and microorganisms

Prokaryotes versus eukaryotes

1. When classifying organisms, early taxonomists did NOT rely on which of the following?

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 best describes the relatedness of members of the three domains?

Members of Domain Eukarya and Domain Archaea are the most closely related domains due to their genetic similarities in ribosomal RNA.

Members of Domain Eukarya and Domain Archaea are the most closely related domains because they both possess a nucleus to house their DNA.

Members of Domain Bacteria and Domain Archaea are the most closely related domains because neither possess a nucleus to house their DNA.

Members of Domain Bacteria and Domain Eukarya are the most closely related domains because they are common pathogens of humans.

Members of Domain Bacteria and Domain Archaea are the most closely related domains because they are all unicellular organisms.

1. You sample three sites in the microbiology lab room, including the doorknob, the whiteboard, and the lab bench. After incubation, growth appears on all three agar plates where the samples were inoculated. What best explains this finding?

Because microorganisms are ubiquitous, it is not surprising to find them in many different areas of the environment.

The lab must be poorly maintained by the custodial staff.

You must have failed to wear gloves when working with the samples from the environment.

It is common to find microorganisms in every area of the lab, but the results would likely be different if testing areas of the home.

1. Which of the following statements are true about the top ten causes of death?

COVID-19 is the only infectious disease responsible for a top ten cause of death in the United States.

COVID-19 is the only infectious disease responsible for a top ten cause of death worldwide.

Most of the top ten causes of death in the United States are the result of infection with a microorganism.

Worldwide, infectious diseases are responsible for several of the top ten causes of death.

1. NCLEX Prep - Test Bank Question: Please read the clinical scenario, and then answer the questions that follow to become familiar with the traditional NCLEX question format.

 Ms. Smith is a 29-year-old patient at the outpatient psychiatric clinic. While completing her assessment you notice her hands are red, raw, and show signs of recent bleeding. She explains that she washes all her clothes in bleach, and uses the chemical to clean her hands several times a day. She states “I need to sterilize myself and my environment of all germs so I do not get sick.” While developing her nursing plan of care, you educate her about the importance of bacteria to the health and well being of not only humans, but also our planet.

1. NCLEX Prep - Test Bank Question: Please read the clinical scenario, and then answer the questions that follow to become familiar with the traditional NCLEX question format.

 Wanda is a medical assistant and the newest employee of your healthcare team. You notice that she does not wash her hands in between patient visits. From your microbiology background, you understand that microbes are not visible with the naked eye. As the only nurse in your small medical office, you provide education for Wanda on the importance of hand washing.

1. NCLEX Prep - Test Bank Question: Please read the clinical scenario, and then answer the questions that follow to become familiar with the traditional NCLEX question format.

 Breonna Jones is 16 years old, 5’4”, and weighs 93 lb. She was admitted to an inpatient medical unit 2 days ago after collapsing at the local high school. Her parents knew she was skinny and had lost weight in the past few months, but had no idea that her life was in danger. The medical team has instituted treatment for anorexia nervosa. As you develop Breonna’s nursing plan of care, you take into consideration the four major biological molecules that are building blocks of all cells.

**Answer Key**Test name: Chapter 1

B

A

D

D

D

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C

C

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Section Break

Section Break

Section Break