

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

1. When humans manipulate the genes of microorganisms the process is called
  - A. bioremediation.
  - B. genetic engineering.
  - C. epidemiology.
  - D. immunology.
  - E. taxonomy.
2. Which of the following is not considered a microorganism?
  - A. mosquito
  - B. protozoan
  - C. bacterium
  - D. virus
  - E. fungus
3. 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.
4. 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. Egyptians using moldy bread on wounds
  - D. *Escherichia coli* producing human insulin
  - E. public health officials monitoring diseases in a community
5. Living things ordinarily too small to be seen with the unaided eye are termed
  - A. bacteria.
  - B. viruses.
  - C. parasites.
  - D. microorganisms.
  - E. None of the choices is correct.
6. The microorganisms that recycle nutrients by breaking down dead matter and wastes are called
  - A. decomposers.
  - B. prokaryotes.
  - C. pathogens.
  - D. eukaryotes.
  - E. fermenters.
7. The microorganisms that do not have a nucleus in their cells are called
  - A. decomposers.
  - B. prokaryotes.
  - C. pathogens.
  - D. eukaryotes.
  - E. fermenters.

8. The first prokaryotes appeared about \_\_\_\_ billion years ago.
  - A. 5
  - B. 4
  - C. 3
  - D. 2
  - E. 1
  
9. Which of the following is not a human use of microorganisms?
  - A. making bread
  - B. treating water and sewage
  - C. manufacturing copper wire
  - D. mass producing antibiotics
  - E. cleaning up oil spills
  
10. Using microbes to detoxify a site contaminated with heavy metals is an example of
  - A. biotechnology.
  - B. bioremediation.
  - C. decomposition.
  - D. immunology.
  - E. epidemiology.
  
11. Disease-causing microorganisms are called
  - A. decomposers.
  - B. prokaryotes.
  - C. pathogens.
  - D. eukaryotes.
  - E. fermenters.
  
12. The number one worldwide infectious diseases are
  - A. AIDS related diseases.
  - B. diarrheal diseases.
  - C. malaria diseases.
  - D. measles.
  - E. respiratory diseases.
  
13. 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
  
14. Helminths are
  - A. bacteria.
  - B. protozoa.
  - C. molds.
  - D. parasitic worms.
  - E. infectious particles.
  
15. Organisms called parasites are
  - A. always classified in the kingdom Monera.
  - B. always harmful to their host.
  - C. the decomposers in ecosystems.
  - D. always a virus.
  - E. free-living.

16. Which group of microorganisms is composed only of hereditary material wrapped in a protein covering?
- A. viruses
  - B. bacteria
  - C. parasites
  - D. fungi
  - E. yeasts
17. 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.
18. 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.
19. 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.
20. Sterile refers to
- A. pathogen free.
  - B. absence of spores.
  - C. absence of any life forms and viral particles.
  - D. pasteurized.
  - E. homogenized.
21. 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
22. Taxonomy does not involve
- A. nomenclature.
  - B. classification.
  - C. taxa.
  - D. identification.
  - E. common name.
23. Which scientific field is involved in the identification, classification, and naming of organisms?
- A. nomenclature
  - B. taxonomy
  - C. phylogeny
  - D. Woesean classification
  - E. None of the choices is correct.

24. The orderly arrangement of organisms into a hierarchy of taxa is called
- classification.
  - identification.
  - nomenclature.
  - experimentation.
  - biotechnology.
25. Which of the following is a taxon that contains all the other taxa listed?
- species
  - phylum
  - kingdom
  - genus
  - family
26. The smallest and most significant taxon is
- genus.
  - species.
  - kingdom.
  - family.
  - phylum.
27. Select the correct descending taxonomic hierarchy (left to right):
- family, order, class
  - family, genus, species
  - genus, species, family
  - class, phylum, order
  - kingdom, domain, phylum
28. Which of the following is a scientific name?
- gram-positive streptococcus
  - Staphylococcus*
  - Streptococcus pyogenes*
  - anthrax
  - Streptobacilli*
29. 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.
30. The study of evolutionary relationships among organisms is called
- biotechnology.
  - genetics.
  - recombinant DNA.
  - phylogeny.
  - taxonomy.
31. 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.

32. 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.
33. The scientist/s that 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.
34. Which scientific name is written correctly?
- Staphylococcus aureus*
  - staphylococcus aureus*
  - Staphylococcus Aureus*
  - Staphylococcus aureus
  - STAPHYLOCOCCUS AUREUS
35. Traditional approaches to taxonomy involved observation of visible morphological characteristics. Today, however, new molecular methods include the examination of
- DNA.
  - rRNA.
  - proteins.
  - All of the choices are correct.
36. A scientist studying helminths is working with bacteria.  
True False
37. The fossil record has established that prokaryotes existed on earth for approximately 2 billion years before eukaryotes appeared.  
True False
38. Many chronic conditions are found to be associated with microbial agents.  
True False
39. All microorganisms are parasites.  
True False
40. The term sterile means free of all life forms.  
True False
41. Members of the same species share many more characteristics compared to those shared by members of the same kingdom.  
True False
42. Once an organism is assigned to a particular taxonomic hierarchy, it is permanent and cannot be revised.  
True False
43. Viruses are not classified in any of Whittaker's 5 kingdoms.  
True False
44. The names of the three proposed Domains are: Bacteria, Protista, Eukarya.  
True False
45. One distinguishing characteristic of the archaebacteria is that they live in extreme environments.  
True False

46. Microbes have been found existing in salty, acidic lakes.  
True False
47. Polar molecules
- A. have an equal charge distribution.
  - B. have an unequal charge distribution.
  - C. are insoluble in water.
  - D. always contain carbon.
  - E. always involve oxygen.
48. The important solvent associated with living things is
- A. carbon dioxide.
  - B. sodium chloride.
  - C. ethyl alcohol.
  - D. benzene.
  - E. water.
49. Which of the following functional groups is mismatched to the organic compound?
- A. phosphate-carbohydrates
  - B. carboxyl-proteins
  - C. amino-proteins
  - D. phosphate-phospholipid
  - E. carboxyl-fatty acids
50. Organic chemicals always have a basic framework of the element \_\_\_\_\_ bonded to other atoms.
- A. carbon
  - B. nitrogen
  - C. oxygen
  - D. hydrogen
  - E. phosphorous
51. Most biochemical macromolecules are polymers, which are
- A. chains of hydrophobic molecules.
  - B. chains of electrolytic molecules.
  - C. chains of repeating monomers.
  - D. chains of repeating carbohydrates.
  - E. chains of hydrogen bonds.
52. All of the following are monosaccharides except
- A. glucose.
  - B. glycogen.
  - C. fructose.
  - D. ribose.
  - E. deoxyribose.
53. Which of the following would have glycosidic bonds?
- A. triglycerides
  - B. monosaccharides
  - C. polypeptides
  - D. polysaccharides
  - E. ATP
54. All of the following are polysaccharides except
- A. glycogen in liver and muscle.
  - B. agar used to make solid culture media.
  - C. a cell's glycocalyx.
  - D. cellulose in certain cell walls.
  - E. prostaglandins in inflammation.

55. All of the following are lipids except
- A. cholesterol.
  - B. starch.
  - C. phospholipid.
  - D. wax.
  - E. triglyceride.
56. What part of a phospholipid forms hydrophobic tails?
- A. fatty acids
  - B. glycerol
  - C. phosphate
  - D. alcohol
  - E. All of the choices are correct.
57. A fat is called \_\_\_\_\_ if all carbons of the fatty acid chain are single bonded to 2 other carbons and 2 hydrogens.
- A. unsaturated
  - B. polyunsaturated
  - C. monounsaturated
  - D. saturated
  - E. None of the choices is correct.
58. The lipid group that serves as energy storage molecules is
- A. prostaglandins.
  - B. waxes.
  - C. phospholipids.
  - D. steroids.
  - E. triglycerides.
59. The lipid group that is the major component of cell membranes is the
- A. prostaglandins.
  - B. waxes.
  - C. phospholipids.
  - D. steroids.
  - E. triglycerides.
60. The building blocks of an enzyme are
- A. nucleotides.
  - B. glycerol and fatty acids.
  - C. monosaccharides.
  - D. phosphate, glycerol, and fatty acids.
  - E. amino acids.
61. An amino acid contains all of the following except
- A. an amino group.
  - B. a carboxyl group.
  - C. a variable R group.
  - D. a carbon.
  - E. a nitrogen base.
62. Which is not true about enzymes?
- A. found in all cells
  - B. are catalysts
  - C. participate in the cell's chemical reactions
  - D. can be denatured by heat and other agents
  - E. have high-energy bonds between phosphates

63. Which amino acid contains sulfur atoms that form covalent disulfide bonds in its tertiary structure?
- A. valine
  - B. cysteine
  - C. serine
  - D. alanine
  - E. tyrosine
64. What type of bonds are formed between adjacent amino acids?
- A. glycosilic
  - B. ester
  - C. peptide
  - D. disulfide
  - E. phosphate
65. The alpha helix is a type of \_\_\_\_\_ protein structure.
- A. primary
  - B. secondary
  - C. tertiary
  - D. quaternary
  - E. None of the choices is correct.
66. One nucleotide contains
- A. one phosphate.
  - B. one pentose sugar.
  - C. one nitrogen base.
  - D. All of the choices are correct.
  - E. None of the choices is correct.
67. Which pertains to DNA but not to RNA?
- A. contains ribose
  - B. contains adenine
  - C. contains thymine
  - D. contains uracil
  - E. contains nucleotides
68. ATP is best described as
- A. an enzyme.
  - B. a double helix.
  - C. an electron carrier.
  - D. the energy molecule of cells.
  - E. All of the choices are correct.
69. 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?
- A. amino acids
  - B. hydrogen and oxygen atoms
  - C. nitrogen and phosphorus
  - D. fatty acids
  - E. carbon atoms
70. Purines and pyrimidines are components in the building block units of all
- A. nucleic acids.
  - B. carbohydrates.
  - C. polysaccharides.
  - D. amino acids.
  - E. enzymes.

71. Which of the following is not a pyrimidine?  
A. uracil  
B. adenine  
C. thymine  
D. cytosine  
E. All of these are pyrimidines.
72. During protein synthesis, \_\_\_\_\_ RNA is made to be a copy of a gene from the DNA.  
A. transfer  
B. messenger  
C. ribosomal  
D. All of the choices are correct.
73. Characteristics shared by all cells include  
A. a membrane serving as a cell boundary.  
B. the possession of genetic information.  
C. the presence of cellular fluid.  
D. All of these choices are correct.
74. The purine\_\_\_\_ always binds with the pyrimidine\_\_ in DNA and RNA.  
A. guanine, cytosine  
B. cytosine, guanine  
C. adenine, guanine  
D. thymine, guanine
75. Water molecules are nonpolar molecules.  
True False
76. The only part of an amino acid that differs from other amino acids is its R group.  
True False
77. All proteins are enzymes.  
True False
78. The most important outcome of polypeptide intra-chain bonding and folding is the unique shape of the protein.  
True False
79. Nucleic acids have primary, secondary, tertiary, and quaternary levels of organization.  
True False
- 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 bleeding. She explains that she washes all her clothes in bleach, and uses the chemical to clean her hands several times a day. She expresses the need to rid herself of all germs. While detailing her plan of care, you inform her of the importance of bacteria to the health and well-being of not only humans but our planet as well.
80. Microorganisms have inhabited the Earth for billions of years, and can be found inhabiting a variety of environments. In fact, microbes performing oxygenic photosynthesis led to the oxygenation of early Earth's atmosphere. These ancient organisms were  
A. prokaryotes.  
B. eukaryotes.  
C. viruses.  
D. prions.

81. Scientists today utilize microorganisms to breakdown toxic chemicals in our environment. The decomposition of pollutants by microbes is referred to as
- A. genetic engineering.
  - B. bioremediation.
  - C. restriction analysis.
  - D. biogenesis.
82. Scientists use microbes to produce drugs, hormones, and enzymes. This type of biotechnology involves the transfer of foreign genetic material into a microbe, a process called
- A. recombinant DNA technology.
  - B. gene therapy.
  - C. bioremediation.
  - D. polymerase chain reaction.

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 patients. 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 take it upon yourself to educate Wanda on the importance of aseptic techniques.

83. Many microbes that inhabit the skin have the potential to cause disease. One such pathogen is *Staphylococcus aureus*. The genus name of this organism is
- A. *aureus*.
  - B. *Staphylococcus*.
  - C. *staphylococcus*.
  - D. *Aureus*.
84. Louis Pasteur hypothesized that microbes were in the air and dust. Through experiments using swan-necked flasks, he disproved the concept of
- A. spontaneous mutation.
  - B. spontaneous generation.
  - C. abiogenesis.
  - D. biogenesis.
85. Aseptic techniques aim to reduce the number of microbes in medical settings, thus preventing wound infection and disease. These techniques were first introduced in a surgical setting by
- A. Dr. Ignaz Semmelweis.
  - B. Joseph Lister.
  - C. Dr. Oliver Wendell.
  - D. Louis Pasteur.
86. Viruses may also be carried from patient to patient transmitting disease, even though they differ from bacteria in that they are
- A. parasitic invertebrate animals.
  - B. infectious proteins.
  - C. metabolically active eukaryotes.
  - D. noncellular particles.

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 93lbs. She was admitted 2 days ago after collapsing at the local high school. Her parents knew she was skinny but had no idea how emaciated she was, or that her life was in danger. As you develop Breonna's plan of care, you take into consideration the 4 major biological molecules that are building blocks of all cells.

87. Carbohydrates, lipids, proteins, and nucleic acids are the 4 main families of biological molecules referred to as
- A. macromolecules.
  - B. monosaccharides.
  - C. polysaccharides.
  - D. micromolecules.
88. The structure of proteins is complex and unique, and only specific molecules can interact with their surface features. The natural shape of each protein is termed the native state. When proteins are exposed to heat, acid, or alcohol, their shape is disrupted and they become nonfunctional or
- A. digested.
  - B. denatured.
  - C. distorted.
  - D. depolymerized.
89. You inform the patient that it is important for her to maintain a diet rich in carbohydrates, lipids, and proteins, so that each of these macromolecules can be metabolized to form a high-energy compound called
- A. cGMP.
  - B. RNA.
  - C. ATP.
  - D. NAD.

# 1 Key

1. When humans manipulate the genes of microorganisms the process is called
- A. bioremediation.
  - B.** genetic engineering.
  - C. epidemiology.
  - D. immunology.
  - E. taxonomy.

*ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.*

*ASM Topic: Module 04 Information Flow*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #1*

*Learning Objective: 01.04 Explain the ways that humans manipulate organisms for their own uses.*

*Section: 01.03*

*Topic: Biotechnology*

*Topic: Genetics*

2. Which of the following is not considered a microorganism?
- A.** mosquito
  - B. protozoan
  - C. bacterium
  - D. virus
  - E. fungus

*ASM Objective: 01.02 Mutations and horizontal gene transfer, along with the immense variety of microenvironments, have resulted in a vast diversity of microorganisms.*

*ASM Topic: Module 01 Evolution*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #2*

*Learning Objective: 01.01 List the various types of microorganisms.*

*Section: 01.01*

*Topic: Microbial World*

3. 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.

*ASM Objective: 01.02 Mutations and horizontal gene transfer, along with the immense variety of microenvironments, have resulted in a vast diversity of microorganisms.*

*ASM Topic: Module 01 Evolution*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #3*

*Learning Objective: 01.01 List the various types of microorganisms.*

*Section: 01.01*

*Topic: Microbial World*

4. 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. Egyptians using moldy bread on wounds
  - D.** *Escherichia coli* producing human insulin
  - E. public health officials monitoring diseases in a community

*ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.*

*ASM Topic: Module 06 Impact of Microorganisms*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #4*

*Learning Objective: 01.04 Explain the ways that humans manipulate organisms for their own uses.*

*Section: 01.03*

*Topic: Biotechnology*

5. Living things ordinarily too small to be seen with the unaided eye are termed
- A. bacteria.
  - B. viruses.
  - C. parasites.
  - D. microorganisms.**
  - E. None of the choices is correct.

*ASM Objective: 01.02 Mutations and horizontal gene transfer, along with the immense variety of microenvironments, have resulted in a vast diversity of microorganisms.*

*ASM Topic: Module 01 Evolution*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #5*

*Learning Objective: 01.01 List the various types of microorganisms.*

*Section: 01.01*

*Topic: Microbial World*

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

*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/animal microflora).*

*ASM Topic: Module 06 Impact of Microorganisms*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #6*

*Learning Objective: 01.02 Describe the role and impact of microbes on the earth.*

*Section: 01.02*

*Topic: Microbial World*

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

*ASM Objective: 01.01 Cells, organelles (e.g. mitochondria and chloroplasts) and all major metabolic pathways evolved from early prokaryotic cells.*

*ASM Topic: Module 01 Evolution*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #7*

*Learning Objective: 01.08 Differentiate between prokaryotic and eukaryotic microorganisms.*

*Section: 01.05*

*Topic: Microbial World*

*Topic: Prokaryotes*

8. The first prokaryotes appeared about \_\_\_\_ billion years ago.
- A. 5
  - B. 4**
  - C. 3
  - D. 2
  - E. 1

*ASM Objective: 01.01 Cells, organelles (e.g. mitochondria and chloroplasts) and all major metabolic pathways evolved from early prokaryotic cells.*

*ASM Topic: Module 01 Evolution*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #8*

*Learning Objective: 01.08 Differentiate between prokaryotic and eukaryotic microorganisms.*

*Section: 01.05*

*Topic: Microbial World*

*Topic: Prokaryotes*

9. Which of the following is not a human use of microorganisms?  
A. making bread  
B. treating water and sewage  
**C.** manufacturing copper wire  
D. mass producing antibiotics  
E. cleaning up oil spills

*ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.*

*ASM Topic: Module 06 Impact of Microorganisms*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #9*

*Learning Objective: 01.04 Explain the ways that humans manipulate organisms for their own uses.*

*Section: 01.03*

*Topic: Applied and Industrial Microbiology*

*Topic: Microbial World*

10. Using microbes to detoxify a site contaminated with heavy metals is an example of  
A. biotechnology.  
**B.** bioremediation.  
C. decomposition.  
D. immunology.  
E. epidemiology.

*ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.*

*ASM Topic: Module 06 Impact of Microorganisms*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #10*

*Learning Objective: 01.04 Explain the ways that humans manipulate organisms for their own uses.*

*Section: 01.03*

*Topic: Applied and Industrial Microbiology*

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

*ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.*

*ASM Topic: Module 05 Systems*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #11*

*Learning Objective: 01.05 Summarize the relative burden of human disease caused by microbes.*

*Section: 01.03*

*Topic: History of Microbiology*

*Topic: Pathogenesis*

12. The number one worldwide infectious diseases are  
A. AIDS related diseases.  
B. diarrheal diseases.  
C. malaria diseases.  
D. measles.  
**E.** respiratory diseases.

*ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.*

*ASM Topic: Module 05 Systems*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #12*

*Learning Objective: 01.05 Summarize the relative burden of human disease caused by microbes.*

*Section: 01.03*

*Topic: Infection and Disease*

*Topic: Microbial World*

13. 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**

*ASM Objective: 01.02 Mutations and horizontal gene transfer, along with the immense variety of microenvironments, have resulted in a vast diversity of microorganisms.*

*ASM Topic: Module 01 Evolution*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #13*

*Learning Objective: 01.09 Identify a third type of microorganism.*

*Section: 01.05*

*Topic: Microbial World*

*Topic: Viruses*

14. Helminths are
- A. bacteria.
  - B. protozoa.
  - C. molds.
  - D. parasitic worms.**
  - E. infectious particles.

*ASM Objective: 01.02 Mutations and horizontal gene transfer, along with the immense variety of microenvironments, have resulted in a vast diversity of microorganisms.*

*ASM Topic: Module 01 Evolution*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #14*

*Learning Objective: 01.01 List the various types of microorganisms.*

*Section: 01.01*

*Topic: Microbial World*

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

*ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.*

*ASM Topic: Module 05 Systems*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #15*

*Learning Objective: 01.01 List the various types of microorganisms.*

*Section: 01.01*

*Topic: Microbial World*

16. Which group of microorganisms is composed only of hereditary material wrapped in a protein covering?
- A. viruses**
  - B. bacteria
  - C. parasites
  - D. fungi
  - E. yeasts

*ASM Objective: 01.02 Mutations and horizontal gene transfer, along with the immense variety of microenvironments, have resulted in a vast diversity of microorganisms.*

*ASM Topic: Module 01 Evolution*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #16*

*Learning Objective: 01.09 Identify a third type of microorganism.*

*Section: 01.05*

*Topic: Microbial World*

*Topic: Viruses*

17. 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.

*ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).*

*ASM Topic: Module 02 Structure and Function  
Blooms Level: 01. Remember  
Cowan - Chapter 01 #17*

*Learning Objective: 01.06 Make a timeline of the development of microbiology from the 1600s to today.  
Section: 01.04*

*Topic: History of Microbiology*

18. 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.

*ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.*

*ASM Topic: Module 05 Systems  
Blooms Level: 01. Remember  
Cowan - Chapter 01 #18*

*Learning Objective: 01.06 Make a timeline of the development of microbiology from the 1600s to today.  
Section: 01.04*

*Topic: History of Microbiology  
Topic: Infection and Disease*

19. 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.

*ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.*

*ASM Topic: Module 03 Metabolic Pathways  
Blooms Level: 01. Remember  
Cowan - Chapter 01 #19*

*Learning Objective: 01.06 Make a timeline of the development of microbiology from the 1600s to today.  
Section: 01.04*

*Topic: History of Microbiology  
Topic: Infection and Disease*

20. Sterile refers to
- A. pathogen free.
  - B. absence of spores.
  - C. absence of any life forms and viral particles.**
  - D. pasteurized.
  - E. homogenized.

*ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.*

*ASM Topic: Module 03 Metabolic Pathways  
Blooms Level: 01. Remember  
Cowan - Chapter 01 #20*

*Learning Objective: 01.06 Make a timeline of the development of microbiology from the 1600s to today.  
Section: 01.04*

*Topic: Control of Microbial Growth  
Topic: History of Microbiology*

21. 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

*ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.*

*ASM Topic: Module 05 Systems*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #21*

*Learning Objective: 01.06 Make a timeline of the development of microbiology from the 1600s to today.*

*Section: 01.04*

*Topic: History of Microbiology*

*Topic: Infection and Disease*

22. Taxonomy does not involve
- A. nomenclature.
  - B. classification.
  - C. taxa.
  - D. identification.
  - E. common name.**

*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.*

*ASM Topic: Module 01 Evolution*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #22*

*Learning Objective: 01.18 Differentiate between the terms nomenclature, taxonomy, and classification.*

*Section: 01.07*

*Topic: Microbial World*

23. Which scientific field is involved in the identification, classification, and naming of organisms?
- A. nomenclature
  - B. taxonomy**
  - C. phylogeny
  - D. Woesean classification
  - E. None of the choices is correct.

*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.*

*ASM Topic: Module 01 Evolution*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #23*

*Learning Objective: 01.18 Differentiate between the terms nomenclature, taxonomy, and classification.*

*Section: 01.07*

*Topic: Microbial World*

24. The orderly arrangement of organisms into a hierarchy of taxa is called
- A. classification.**
  - B. identification.
  - C. nomenclature.
  - D. experimentation.
  - E. biotechnology.

*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.*

*ASM Topic: Module 01 Evolution*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #24*

*Learning Objective: 01.18 Differentiate between the terms nomenclature, taxonomy, and classification.*

*Section: 01.07*

*Topic: Microbial World*

25. Which of the following is a taxon that contains all the other taxa listed?
- A. species
  - B. phylum
  - C. kingdom**
  - D. genus
  - E. family

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Blooms Level: 01. Remember

Cowan - Chapter 01 #25

Learning Objective: 01.19 Create a mnemonic device for remembering the taxonomic categories.

Section: 01.07

Topic: Microbial World

26. The smallest and most significant taxon is
- A. genus.
  - B. species.**
  - C. kingdom.
  - D. family.
  - E. phylum.

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.

ASM Topic: Module 01 Evolution

Blooms Level: 01. Remember

Cowan - Chapter 01 #26

Learning Objective: 01.19 Create a mnemonic device for remembering the taxonomic categories.

Section: 01.07

Topic: Microbial World

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

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.

ASM Topic: Module 01 Evolution

Blooms Level: 01. Remember

Cowan - Chapter 01 #27

Learning Objective: 01.19 Create a mnemonic device for remembering the taxonomic categories.

Section: 01.07

Topic: Microbial World

28. Which of the following is a scientific name?
- A. gram-positive streptococcus
  - B. *Staphylococcus*
  - C. *Streptococcus pyogenes***
  - D. anthrax
  - E. *Streptobacilli*

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.

ASM Topic: Module 01 Evolution

Blooms Level: 01. Remember

Cowan - Chapter 01 #28

Learning Objective: 01.20 Correctly write the binomial name for a microorganism.

Section: 01.07

Topic: Microbial World

29. 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.

*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.*

*ASM Topic: Module 01 Evolution*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #29*

*Learning Objective: 01.20 Correctly write the binomial name for a microorganism.*

*Section: 01.07*

*Topic: Microbial World*

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

*ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.*

*ASM Topic: Module 01 Evolution*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #30*

*Learning Objective: 01.21 Draw a diagram of the three major domains.*

*Section: 01.07*

*Topic: Microbial World*

31. Which area of biology states that living things undergo gradual, structural, and functional changes over long periods of time?  
A. morphology  
B. phylogeny  
**C.** evolution  
D. genetics  
E. None of the choices is correct.

*ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.*

*ASM Topic: Module 01 Evolution*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #31*

*Learning Objective: 01.03 Explain the theory of evolution and why it is still called a theory.*

*Section: 01.02*

*Topic: Microbial World*

32. 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.

*ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.*

*ASM Topic: Module 01 Evolution*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #32*

*Learning Objective: 01.22 Explain the difference between traditional and molecular approaches to taxonomy.*

*Section: 01.07*

*Topic: Microbial World*

33. The scientist/s that proposed organisms be assigned 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.

*ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.*

*ASM Topic: Module 01 Evolution*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #33*

*Learning Objective: 01.21 Draw a diagram of the three major domains.*

*Section: 01.07*

*Topic: Microbial World*

34. Which scientific name is written correctly?  
**A.** *Staphylococcus aureus*  
B. *staphylococcus aureus*  
C. *Staphylococcus Aureus*  
D. Staphylococcus aureus  
E. STAPHYLOCOCCUS AUREUS

*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.*

*ASM Topic: Module 01 Evolution*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #34*

*Learning Objective: 01.20 Correctly write the binomial name for a microorganism.*

*Section: 01.07*

*Topic: Microbial World*

35. Traditional approaches to taxonomy involved observation of visible morphological characteristics. Today, however, new molecular methods include the examination of  
A. DNA.  
B. rRNA.  
C. proteins.  
**D.** All of the choices are correct.

*ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.*

*ASM Topic: Module 01 Evolution*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #35*

*Learning Objective: 01.22 Explain the difference between traditional and molecular approaches to taxonomy.*

*Section: 01.07*

*Topic: Microbial World*

36. A scientist studying helminths is working with bacteria.  
**FALSE**

*ASM Objective: 01.02 Mutations and horizontal gene transfer, along with the immense variety of microenvironments, have resulted in a vast diversity of microorganisms.*

*ASM Topic: Module 01 Evolution*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #36*

*Learning Objective: 01.01 List the various types of microorganisms.*

*Section: 01.01*

*Topic: Eukaryotes*

*Topic: Microbial World*

37. The fossil record has established that prokaryotes existed on earth for approximately 2 billion years before eukaryotes appeared.  
**TRUE**

*ASM Objective: 01.01 Cells, organelles (e.g. mitochondria and chloroplasts) and all major metabolic pathways evolved from early prokaryotic cells.*

*ASM Topic: Module 01 Evolution*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #37*

*Learning Objective: 01.02 Describe the role and impact of microbes on the earth.*

*Section: 01.02*

*Topic: Microbial World*

38. Many chronic conditions are found to be associated with microbial agents.

**TRUE**

*ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.*

*ASM Topic: Module 05 Systems*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #38*

*Learning Objective: 01.05 Summarize the relative burden of human disease caused by microbes.*

*Section: 01.03*

*Topic: Microbial World*

*Topic: Pathogenesis*

39. All microorganisms are parasites.

**FALSE**

*ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.*

*ASM Topic: Module 05 Systems*

*Blooms Level: 02. Understand*

*Cowan - Chapter 01 #39*

*Learning Objective: 01.05 Summarize the relative burden of human disease caused by microbes.*

*Section: 01.03*

*Topic: Microbial World*

40. The term sterile means free of all life forms.

**TRUE**

*ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #40*

*Learning Objective: 01.06 Make a timeline of the development of microbiology from the 1600s to today.*

*Section: 01.04*

*Topic: Control of Microbial Growth*

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

**TRUE**

*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.*

*ASM Topic: Module 01 Evolution*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #41*

*Learning Objective: 01.19 Create a mnemonic device for remembering the taxonomic categories.*

*Section: 01.07*

*Topic: Microbial World*

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

**FALSE**

*ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.*

*ASM Topic: Module 01 Evolution*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #42*

*Learning Objective: 01.22 Explain the difference between traditional and molecular approaches to taxonomy.*

*Section: 01.07*

*Topic: Microbial World*

43. Viruses are not classified in any of Whittaker's 5 kingdoms.

**TRUE**

*ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.*

*ASM Topic: Module 01 Evolution*

*Blooms Level: 02. Understand*

*Cowan - Chapter 01 #43*

*Learning Objective: 01.19 Create a mnemonic device for remembering the taxonomic categories.*

*Section: 01.07*

*Topic: Microbial World*

*Topic: Viruses*

44. The names of the three proposed Domains are: Bacteria, Protista, Eukarya.

**FALSE**

*ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.*

*ASM Topic: Module 01 Evolution*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #44*

*Learning Objective: 01.21 Draw a diagram of the three major domains.*

*Section: 01.07*

*Topic: Microbial World*

45. One distinguishing characteristic of the archaebacteria is that they live in extreme environments.

**TRUE**

*ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #45*

*Learning Objective: 01.21 Draw a diagram of the three major domains.*

*Section: 01.07*

*Topic: Microbial World*

46. Microbes have been found existing in salty, acidic lakes.

**TRUE**

*ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.*

*ASM Topic: Module 05 Systems*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #46*

*Learning Objective: 01.02 Describe the role and impact of microbes on the earth.*

*Section: 01.02*

*Topic: Microbial World*

47. Polar molecules

A. have an equal charge distribution.

**B.** have an unequal charge distribution.

C. are insoluble in water.

D. always contain carbon.

E. always involve oxygen.

*ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #47*

*Learning Objective: 01.11 Name the four main families of biochemicals.*

*Section: 01.06*

*Topic: Chemistry*

48. The important solvent associated with living things is

A. carbon dioxide.

B. sodium chloride.

C. ethyl alcohol.

D. benzene.

**E.** water.

*ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #48*

*Learning Objective: 01.11 Name the four main families of biochemicals.*

*Section: 01.06*

*Topic: Chemistry*

49. Which of the following functional groups is mismatched to the organic compound?

**A.** phosphate-carbohydrates

B. carboxyl-proteins

C. amino-proteins

D. phosphate-phospholipid

E. carboxyl-fatty acids

*ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #49*

*Learning Objective: 01.11 Name the four main families of biochemicals.*

*Section: 01.06*

*Topic: Chemistry*

50. Organic chemicals always have a basic framework of the element \_\_\_\_\_ bonded to other atoms.
- A.** carbon
  - B. nitrogen
  - C. oxygen
  - D. hydrogen
  - E. phosphorous

*ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #50*

*Learning Objective: 01.11 Name the four main families of biochemicals.*

*Section: 01.06*

*Topic: Chemistry*

51. Most biochemical macromolecules are polymers, which are
- A. chains of hydrophobic molecules.
  - B. chains of electrolytic molecules.
  - C.** chains of repeating monomers.
  - D. chains of repeating carbohydrates.
  - E. chains of hydrogen bonds.

*ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #51*

*Learning Objective: 01.11 Name the four main families of biochemicals.*

*Section: 01.06*

*Topic: Chemistry*

52. All of the following are monosaccharides except
- A. glucose.
  - B.** glycogen.
  - C. fructose.
  - D. ribose.
  - E. deoxyribose.

*ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #52*

*Learning Objective: 01.12 Provide examples of cell components made from each of the families of biochemicals.*

*Section: 01.06*

*Topic: Chemistry*

53. Which of the following would have glycosidic bonds?
- A. triglycerides
  - B. monosaccharides
  - C. polypeptides
  - D.** polysaccharides
  - E. ATP

*ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #53*

*Learning Objective: 01.12 Provide examples of cell components made from each of the families of biochemicals.*

*Section: 01.06*

*Topic: Chemistry*

54. All of the following are polysaccharides except
- A. glycogen in liver and muscle.
  - B. agar used to make solid culture media.
  - C. a cell's glycocalyx.
  - D. cellulose in certain cell walls.
  - E.** prostaglandins in inflammation.

*ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #54*

*Learning Objective: 01.12 Provide examples of cell components made from each of the families of biochemicals.*

*Section: 01.06*

*Topic: Chemistry*

55. All of the following are lipids except
- A. cholesterol.
  - B.** starch.
  - C. phospholipid.
  - D. wax.
  - E. triglyceride.

*ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #55*

*Learning Objective: 01.12 Provide examples of cell components made from each of the families of biochemicals.*

*Section: 01.06*

*Topic: Chemistry*

56. What part of a phospholipid forms hydrophobic tails?
- A.** fatty acids
  - B. glycerol
  - C. phosphate
  - D. alcohol
  - E. All of the choices are correct.

*ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #56*

*Learning Objective: 01.12 Provide examples of cell components made from each of the families of biochemicals.*

*Section: 01.06*

*Topic: Chemistry*

57. A fat is called \_\_\_\_\_ if all carbons of the fatty acid chain are single bonded to 2 other carbons and 2 hydrogens.
- A. unsaturated
  - B. polyunsaturated
  - C. monounsaturated
  - D.** saturated
  - E. None of the choices is correct.

*ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #57*

*Learning Objective: 01.12 Provide examples of cell components made from each of the families of biochemicals.*

*Section: 01.06*

*Topic: Chemistry*

58. The lipid group that serves as energy storage molecules is
- A. prostaglandins.
  - B. waxes.
  - C. phospholipids.
  - D. steroids.
  - E. triglycerides.**

*ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #58*

*Learning Objective: 01.12 Provide examples of cell components made from each of the families of biochemicals.*

*Section: 01.06*

*Topic: Chemistry*

59. The lipid group that is the major component of cell membranes is the
- A. prostaglandins.
  - B. waxes.
  - C. phospholipids.**
  - D. steroids.
  - E. triglycerides.

*ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #59*

*Learning Objective: 01.12 Provide examples of cell components made from each of the families of biochemicals.*

*Section: 01.06*

*Topic: Chemistry*

60. The building blocks of an enzyme are
- A. nucleotides.
  - B. glycerol and fatty acids.
  - C. monosaccharides.
  - D. phosphate, glycerol, and fatty acids.
  - E. amino acids.**

*ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #60*

*Learning Objective: 01.12 Provide examples of cell components made from each of the families of biochemicals.*

*Section: 01.06*

*Topic: Chemistry*

61. An amino acid contains all of the following except
- A. an amino group.
  - B. a carboxyl group.
  - C. a variable R group.
  - D. a carbon.
  - E. a nitrogen base.**

*ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #61*

*Learning Objective: 01.11 Name the four main families of biochemicals.*

*Section: 01.06*

*Topic: Chemistry*

62. Which is not true about enzymes?
- A. found in all cells
  - B. are catalysts
  - C. participate in the cell's chemical reactions
  - D. can be denaturated by heat and other agents
  - E. have high-energy bonds between phosphates**

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Blooms Level: 01. Remember

Cowan - Chapter 01 #62

Learning Objective: 01.12 Provide examples of cell components made from each of the families of biochemicals.

Section: 01.06

Topic: Chemistry

63. Which amino acid contains sulfur atoms that form covalent disulfide bonds in its tertiary structure?
- A. valine
  - B. cysteine**
  - C. serine
  - D. alanine
  - E. tyrosine

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Blooms Level: 01. Remember

Cowan - Chapter 01 #63

Learning Objective: 01.13 Explain primary, secondary, tertiary, and quaternary structure as seen in proteins.

Section: 01.06

Topic: Chemistry

64. What type of bonds are formed between adjacent amino acids?
- A. glycosilic
  - B. ester
  - C. peptide**
  - D. disulfide
  - E. phosphate

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Blooms Level: 01. Remember

Cowan - Chapter 01 #64

Learning Objective: 01.11 Name the four main families of biochemicals.

Learning Objective: 01.13 Explain primary, secondary, tertiary, and quaternary structure as seen in proteins.

Section: 01.06

Topic: Chemistry

65. The alpha helix is a type of \_\_\_\_\_ protein structure.
- A. primary
  - B. secondary**
  - C. tertiary
  - D. quaternary
  - E. None of the choices is correct.

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Blooms Level: 01. Remember

Cowan - Chapter 01 #65

Learning Objective: 01.13 Explain primary, secondary, tertiary, and quaternary structure as seen in proteins.

Section: 01.06

Topic: Chemistry

66. One nucleotide contains
- A. one phosphate.
  - B. one pentose sugar.
  - C. one nitrogen base.
  - D.** All of the choices are correct.
  - E. None of the choices is correct.

*ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.*

*ASM Topic: Module 04 Information Flow*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #66*

*Learning Objective: 01.14 List the three components of nucleic acids.*

*Section: 01.06*

*Topic: Chemistry*

67. Which pertains to DNA but not to RNA?
- A. contains ribose
  - B. contains adenine
  - C.** contains thymine
  - D. contains uracil
  - E. contains nucleotides

*ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.*

*ASM Topic: Module 04 Information Flow*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #67*

*Learning Objective: 01.15 Name the nucleotides of DNA and RNA.*

*Section: 01.06*

*Topic: Chemistry*

68. ATP is best described as
- A. an enzyme.
  - B. a double helix.
  - C. an electron carrier.
  - D.** the energy molecule of cells.
  - E. All of the choices are correct.

*ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #68*

*Learning Objective: 01.16 List the three components of ATP.*

*Section: 01.06*

*Topic: Chemistry*

69. 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?
- A. amino acids
  - B. hydrogen and oxygen atoms
  - C.** nitrogen and phosphorus
  - D. fatty acids
  - E. carbon atoms

*ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 02. Understand*

*Cowan - Chapter 01 #69*

*Learning Objective: 01.11 Name the four main families of biochemicals.*

*Section: 01.06*

*Topic: Chemistry*

70. Purines and pyrimidines are components in the building block units of all  
**A.** nucleic acids.  
B. carbohydrates.  
C. polysaccharides.  
D. amino acids.  
E. enzymes.

*ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.*

*ASM Topic: Module 04 Information Flow*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #70*

*Learning Objective: 01.14 List the three components of nucleic acids.*

*Section: 01.06*

*Topic: Chemistry*

71. Which of the following is not a pyrimidine?  
A. uracil  
**B.** adenine  
C. thymine  
D. cytosine  
E. All of these are pyrimidines.

*ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.*

*ASM Topic: Module 04 Information Flow*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #71*

*Learning Objective: 01.14 List the three components of nucleic acids.*

*Section: 01.06*

*Topic: Chemistry*

72. During protein synthesis, \_\_\_\_\_ RNA is made to be a copy of a gene from the DNA.  
A. transfer  
**B.** messenger  
C. ribosomal  
D. All of the choices are correct.

*ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.*

*ASM Topic: Module 04 Information Flow*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #72*

*Learning Objective: 01.14 List the three components of nucleic acids.*

*Section: 01.06*

*Topic: Chemistry*

73. Characteristics shared by all cells include  
A. a membrane serving as a cell boundary.  
B. the possession of genetic information.  
C. the presence of cellular fluid.  
**D.** All of these choices are correct.

*ASM Objective: 01.01 Cells, organelles (e.g. mitochondria and chloroplasts) and all major metabolic pathways evolved from early prokaryotic cells.*

*ASM Topic: Module 01 Evolution*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #73*

*Learning Objective: 01.17 Point out three characteristics all cells share.*

*Section: 01.06*

*Topic: Chemistry*

74. The purine\_\_\_\_ always binds with the pyrimidine\_\_ in DNA and RNA.  
**A.** guanine, cytosine  
B. cytosine, guanine  
C. adenine, guanine  
D. thymine, guanine

*ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.*

*ASM Topic: Module 04 Information Flow*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #74*

*Learning Objective: 01.15 Name the nucleotides of DNA and RNA.*

*Section: 01.06*

*Topic: Chemistry*

75. Water molecules are nonpolar molecules.

**FALSE**

*ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #75*

*Learning Objective: 01.11 Name the four main families of biochemicals.*

*Section: 01.06*

*Topic: Chemistry*

76. The only part of an amino acid that differs from other amino acids is its R group.

**TRUE**

*ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #76*

*Learning Objective: 01.11 Name the four main families of biochemicals.*

*Section: 01.06*

*Topic: Chemistry*

77. All proteins are enzymes.

**FALSE**

*ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #77*

*Learning Objective: 01.13 Explain primary, secondary, tertiary, and quaternary structure as seen in proteins.*

*Section: 01.06*

*Topic: Chemistry*

78. The most important outcome of polypeptide intra-chain bonding and folding is the unique shape of the protein.

**TRUE**

*ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #78*

*Learning Objective: 01.13 Explain primary, secondary, tertiary, and quaternary structure as seen in proteins.*

*Section: 01.06*

*Topic: Chemistry*

79. Nucleic acids have primary, secondary, tertiary, and quaternary levels of organization.

**FALSE**

*ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.*

*ASM Topic: Module 04 Information Flow*

*Blooms Level: 01. Remember*

*Cowan - Chapter 01 #79*

*Learning Objective: 01.13 Explain primary, secondary, tertiary, and quaternary structure as seen in proteins.*

*Section: 01.06*

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 bleeding. She explains that she washes all her clothes in bleach, and uses the chemical to clean her hands several times a day. She expresses the need to rid herself of all germs. While detailing her plan of care, you inform her of the importance of bacteria to the health and well-being of not only humans but our planet as well.

*ASM Objective: 01.01 Cells, organelles (e.g. mitochondria and chloroplasts) and all major metabolic pathways evolved from early prokaryotic cells.*

*ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.*

*ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.*

*ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.*

*ASM Topic: Module 01 Evolution*

*ASM Topic: Module 04 Information Flow*

*ASM Topic: Module 05 Systems*

*ASM Topic: Module 06 Impact of Microorganisms*

*Blooms Level: 03. Apply*

*Cowan - Chapter 01*

*Learning Objective: 01.04 Explain the ways that humans manipulate organisms for their own uses.*

*Learning Objective: 01.08 Differentiate between prokaryotic and eukaryotic microorganisms.*

*Learning Objective: 01.21 Draw a diagram of the three major domains.*

*Section: 01.03*

*Section: 01.05*

*Section: 01.07*

*Topic: Microbial World*

80. Microorganisms have inhabited the Earth for billions of years, and can be found inhabiting a variety of environments. In fact, microbes performing oxygenic photosynthesis led to the oxygenation of early Earth's atmosphere. These ancient organisms were

- A.** prokaryotes.
- B. eukaryotes.
- C. viruses.
- D. prions.

*ASM Objective: 01.01 Cells, organelles (e.g. mitochondria and chloroplasts) and all major metabolic pathways evolved from early prokaryotic cells.*

*ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.*

*ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.*

*ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.*

*ASM Topic: Module 01 Evolution*

*ASM Topic: Module 04 Information Flow*

*ASM Topic: Module 05 Systems*

*ASM Topic: Module 06 Impact of Microorganisms*

*Blooms Level: 03. Apply*

*Cowan - Chapter 01 #80*

*Learning Objective: 01.04 Explain the ways that humans manipulate organisms for their own uses.*

*Learning Objective: 01.08 Differentiate between prokaryotic and eukaryotic microorganisms.*

*Learning Objective: 01.21 Draw a diagram of the three major domains.*

*Section: 01.03*

*Section: 01.05*

*Section: 01.07*

*Topic: Microbial World*

81. Scientists today utilize microorganisms to breakdown toxic chemicals in our environment. The decomposition of pollutants by microbes is referred to as

- A. genetic engineering.
- B.** bioremediation.
- C. restriction analysis.
- D. biogenesis.

*ASM Objective: 01.01 Cells, organelles (e.g. mitochondria and chloroplasts) and all major metabolic pathways evolved from early prokaryotic cells.*

*ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.*

*ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.*

*ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.*

*ASM Topic: Module 01 Evolution*

*ASM Topic: Module 04 Information Flow*

*ASM Topic: Module 05 Systems*

*ASM Topic: Module 06 Impact of Microorganisms*

*Blooms Level: 03. Apply*

*Cowan - Chapter 01 #81*

*Learning Objective: 01.04 Explain the ways that humans manipulate organisms for their own uses.*

*Learning Objective: 01.08 Differentiate between prokaryotic and eukaryotic microorganisms.*

*Learning Objective: 01.21 Draw a diagram of the three major domains.*

*Section: 01.03*

*Section: 01.05*

*Section: 01.07*

*Topic: Microbial World*

82. Scientists use microbes to produce drugs, hormones, and enzymes. This type of biotechnology involves the transfer of foreign genetic material into a microbe, a process called **A.** recombinant DNA technology.  
B. gene therapy.  
C. bioremediation.  
D. polymerase chain reaction.

*ASM Objective: 01.01 Cells, organelles (e.g. mitochondria and chloroplasts) and all major metabolic pathways evolved from early prokaryotic cells.*

*ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.*

*ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.*

*ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.*

*ASM Topic: Module 01 Evolution*

*ASM Topic: Module 04 Information Flow*

*ASM Topic: Module 05 Systems*

*ASM Topic: Module 06 Impact of Microorganisms*

*Blooms Level: 03. Apply*

*Cowan - Chapter 01 #82*

*Learning Objective: 01.04 Explain the ways that humans manipulate organisms for their own uses.*

*Learning Objective: 01.08 Differentiate between prokaryotic and eukaryotic microorganisms.*

*Learning Objective: 01.21 Draw a diagram of the three major domains.*

*Section: 01.03*

*Section: 01.05*

*Section: 01.07*

*Topic: Microbial World*

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 patients. 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 take it upon yourself to educate Wanda on the importance of aseptic techniques.

*ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.*

*ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).*

*ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.*

*ASM Objective: 08.02 Use aseptic and pure culture techniques to enrich for and isolate microorganisms.*

*ASM Topic: Module 01 Evolution*

*ASM Topic: Module 02 Structure and Function*

*ASM Topic: Module 05 Systems*

*ASM Topic: Module 08 Microbiology Skills*

*Blooms Level: 03. Apply*

*Cowan - Chapter 01*

*Learning Objective: 01.01 List the various types of microorganisms.*

*Learning Objective: 01.05 Summarize the relative burden of human disease caused by microbes.*

*Learning Objective: 01.09 Identify a third type of microorganism.*

*Section: 01.01*

*Section: 01.03*

*Section: 01.05*

*Topic: History of Microbiology*

*Topic: Microbial World*

83. Many microbes that inhabit the skin have the potential to cause disease. One such pathogen is *Staphylococcus aureus*. The genus name of this organism is **B.** *Staphylococcus*.  
A. *aureus*.  
C. *staphylococcus*.  
D. *Aureus*.

*ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.*

*ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).*

*ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.*

*ASM Objective: 08.02 Use aseptic and pure culture techniques to enrich for and isolate microorganisms.*

*ASM Topic: Module 01 Evolution*

*ASM Topic: Module 02 Structure and Function*

*ASM Topic: Module 05 Systems*

*ASM Topic: Module 08 Microbiology Skills*

*Blooms Level: 03. Apply*

*Cowan - Chapter 01 #83*

*Learning Objective: 01.01 List the various types of microorganisms.*

*Learning Objective: 01.05 Summarize the relative burden of human disease caused by microbes.*

*Learning Objective: 01.09 Identify a third type of microorganism.*

*Section: 01.03*

*Section: 01.05*

*Topic: History of Microbiology*

*Topic: Microbial World*

84. Louis Pasteur hypothesized that microbes were in the air and dust. Through experiments using swan-necked flasks, he disproved the concept of
- spontaneous mutation.
  - spontaneous generation.**
  - abiogenesis.
  - biogenesis.

*ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.*

*ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).*

*ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.*

*ASM Objective: 08.02 Use aseptic and pure culture techniques to enrich for and isolate microorganisms.*

*ASM Topic: Module 01 Evolution*

*ASM Topic: Module 02 Structure and Function*

*ASM Topic: Module 05 Systems*

*ASM Topic: Module 08 Microbiology Skills*

*Blooms Level: 03. Apply*

*Cowan - Chapter 01 #84*

*Learning Objective: 01.01 List the various types of microorganisms.*

*Learning Objective: 01.05 Summarize the relative burden of human disease caused by microbes.*

*Learning Objective: 01.09 Identify a third type of microorganism.*

*Section: 01.03*

*Section: 01.05*

*Topic: History of Microbiology*

*Topic: Microbial World*

85. Aseptic techniques aim to reduce the number of microbes in medical settings, thus preventing wound infection and disease. These techniques were first introduced in a surgical setting by
- Dr. Ignaz Semmelweis.
  - Joseph Lister.**
  - Dr. Oliver Wendell.
  - Louis Pasteur.

*ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.*

*ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).*

*ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.*

*ASM Objective: 08.02 Use aseptic and pure culture techniques to enrich for and isolate microorganisms.*

*ASM Topic: Module 01 Evolution*

*ASM Topic: Module 02 Structure and Function*

*ASM Topic: Module 05 Systems*

*ASM Topic: Module 08 Microbiology Skills*

*Blooms Level: 03. Apply*

*Cowan - Chapter 01 #85*

*Learning Objective: 01.01 List the various types of microorganisms.*

*Learning Objective: 01.05 Summarize the relative burden of human disease caused by microbes.*

*Learning Objective: 01.09 Identify a third type of microorganism.*

*Section: 01.03*

*Section: 01.05*

*Topic: History of Microbiology*

*Topic: Microbial World*

86. Viruses may also be carried from patient to patient transmitting disease, even though they differ from bacteria in that they are
- parasitic invertebrate animals.
  - infectious proteins.
  - metabolically active eukaryotes.
  - noncellular particles.**

*ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.*

*ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).*

*ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.*

*ASM Objective: 08.02 Use aseptic and pure culture techniques to enrich for and isolate microorganisms.*

*ASM Topic: Module 01 Evolution*

*ASM Topic: Module 02 Structure and Function*

*ASM Topic: Module 05 Systems*

*ASM Topic: Module 08 Microbiology Skills*

*Blooms Level: 03. Apply*

*Cowan - Chapter 01 #86*

*Learning Objective: 01.01 List the various types of microorganisms.*

*Learning Objective: 01.05 Summarize the relative burden of human disease caused by microbes.*

*Learning Objective: 01.09 Identify a third type of microorganism.*

*Section: 01.03*

*Section: 01.05*

*Topic: History of Microbiology*

*Topic: Microbial World*

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 93lbs. She was admitted 2 days ago after collapsing at the local high school. Her parents knew she was skinny but had no idea how emaciated she was, or that her life was in danger. As you develop Breonna's plan of care, you take into consideration the 4 major biological molecules that are building blocks of all cells.

*ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 03. Apply*

*Cowan - Chapter 01*

*Learning Objective: 01.11 Name the four main families of biochemicals.*

*Learning Objective: 01.12 Provide examples of cell components made from each of the families of biochemicals.*

*Learning Objective: 01.13 Explain primary, secondary, tertiary, and quaternary structure as seen in proteins.*

*Learning Objective: 01.16 List the three components of ATP.*

*Section: 01.06*

*Topic: Chemistry*

87. Carbohydrates, lipids, proteins, and nucleic acids are the 4 main families of biological molecules referred to as
- A.** macromolecules.
  - B. monosaccharides.
  - C. polysaccharides.
  - D. micromolecules.

*ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 03. Apply*

*Cowan - Chapter 01 #87*

*Learning Objective: 01.11 Name the four main families of biochemicals.*

*Learning Objective: 01.12 Provide examples of cell components made from each of the families of biochemicals.*

*Learning Objective: 01.13 Explain primary, secondary, tertiary, and quaternary structure as seen in proteins.*

*Learning Objective: 01.16 List the three components of ATP.*

*Section: 01.06*

*Topic: Chemistry*

88. The structure of proteins is complex and unique, and only specific molecules can interact with their surface features. The natural shape of each protein is termed the native state. When proteins are exposed to heat, acid, or alcohol, their shape is disrupted and they become nonfunctional or
- A. digested.
  - B.** denatured.
  - C. distorted.
  - D. depolymerized.

*ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 03. Apply*

*Cowan - Chapter 01 #88*

*Learning Objective: 01.11 Name the four main families of biochemicals.*

*Learning Objective: 01.12 Provide examples of cell components made from each of the families of biochemicals.*

*Learning Objective: 01.13 Explain primary, secondary, tertiary, and quaternary structure as seen in proteins.*

*Learning Objective: 01.16 List the three components of ATP.*

*Section: 01.06*

*Topic: Chemistry*

89. You inform the patient that it is important for her to maintain a diet rich in carbohydrates, lipids, and proteins, so that each of these macromolecules can be metabolized to form a high-energy compound called
- A. cGMP.
  - B. RNA.
  - C.** ATP.
  - D. NAD.

*ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).*

*ASM Topic: Module 03 Metabolic Pathways*

*Blooms Level: 03. Apply*

*Cowan - Chapter 01 #89*

*Learning Objective: 01.11 Name the four main families of biochemicals.*

*Learning Objective: 01.12 Provide examples of cell components made from each of the families of biochemicals.*

*Learning Objective: 01.13 Explain primary, secondary, tertiary, and quaternary structure as seen in proteins.*

*Learning Objective: 01.16 List the three components of ATP.*

*Section: 01.06*

*Topic: Chemistry*



# 1 Summary

<u>Category</u>	<u># of Questions</u>
ASM Objective: 01.01 Cells, organelles (e.g. mitochondria and chloroplasts) and all major metabolic pathways evolved from early prokaryotic cells.	8
ASM Objective: 01.02 Mutations and horizontal gene transfer, along with the immense variety of microenvironments, have resulted in a vast diversity of microorganisms.	7
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.	9
ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.	14
ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).	6
ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).	28
ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.	2
ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.	3
ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.	7
ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.	5
ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.	1
ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.	4
ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.	12
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/animal microflora).	1
ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.	7
ASM Objective: 08.02 Use aseptic and pure culture techniques to enrich for and isolate microorganisms.	5
ASM Topic: Module 01 Evolution	38
ASM Topic: Module 02 Structure and Function	6
ASM Topic: Module 03 Metabolic Pathways	33
ASM Topic: Module 04 Information Flow	12
ASM Topic: Module 05 Systems	17
ASM Topic: Module 06 Impact of Microorganisms	8
ASM Topic: Module 08 Microbiology Skills	5
Blooms Level: 01. Remember	76
Blooms Level: 02. Understand	3
Blooms Level: 03. Apply	13
Cowan - Chapter 01	92
Learning Objective: 01.01 List the various types of microorganisms.	11
Learning Objective: 01.02 Describe the role and impact of microbes on the earth.	3
Learning Objective: 01.03 Explain the theory of evolution and why it is still called a theory.	1
Learning Objective: 01.04 Explain the ways that humans manipulate organisms for their own uses.	8
Learning Objective: 01.05 Summarize the relative burden of human disease caused by microbes.	9
Learning Objective: 01.06 Make a timeline of the development of microbiology from the 1600s to today.	6
Learning Objective: 01.08 Differentiate between prokaryotic and eukaryotic microorganisms.	6
Learning Objective: 01.09 Identify a third type of microorganism.	7
Learning Objective: 01.11 Name the four main families of biochemicals.	14
Learning Objective: 01.12 Provide examples of cell components made from each of the families of biochemicals.	14
Learning Objective: 01.13 Explain primary, secondary, tertiary, and quaternary structure as seen in proteins.	10
Learning Objective: 01.14 List the three components of nucleic acids.	4
Learning Objective: 01.15 Name the nucleotides of DNA and RNA.	2
Learning Objective: 01.16 List the three components of ATP.	5
Learning Objective: 01.17 Point out three characteristics all cells share.	1
Learning Objective: 01.18 Differentiate between the terms nomenclature, taxonomy, and classification.	3
Learning Objective: 01.19 Create a mnemonic device for remembering the taxonomic categories.	5
Learning Objective: 01.20 Correctly write the binomial name for a microorganism.	3

Learning Objective: 01.21 Draw a diagram of the three major domains.	8
Learning Objective: 01.22 Explain the difference between traditional and molecular approaches to taxonomy.	3
Section: 01.01	7
Section: 01.02	4
Section: 01.03	17
Section: 01.04	6
Section: 01.05	13
Section: 01.06	37
Section: 01.07	22
Topic: Applied and Industrial Microbiology	2
Topic: Biotechnology	2
Topic: Chemistry	36
Topic: Control of Microbial Growth	2
Topic: Eukaryotes	1
Topic: Genetics	1
Topic: History of Microbiology	11
Topic: Infection and Disease	4
Topic: Microbial World	45
Topic: Pathogenesis	2
Topic: Prokaryotes	2
Topic: Viruses	3