Student name:_____

TRUE/FALSE - Write 'T' if the statement is true and 'F' if the statement is false.

1) Electrons that participate in chemical bonding are typically located closest to the nucleus.

- ◎ true
- ◎ false

2) Water molecules are nonpolar molecules.

- ◎ true
- ◎ false

3) Polar molecules have more reactivity compared to nonpolar molecules.

- ◎ true
- ◎ false

4) A covalent bond is formed between an anion and a cation.

- ◎ true
- ◎ false

5) The concentration of a solution expresses the amount of solvent present.

- ◎ true
- ◎ false

◎ true

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

- ⊙ true
- ⊙ false

8) All proteins are enzymes.

- ⊙ true
- ⊙ false

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

- ⊙ true
- ⊙ false

10) The most important outcome of polypeptide intrachain bonding and folding is the unique shape of the protein.

- ⊙ true
- ⊙ false

11) A new organism was identified that contained arsenic in place of phosphate in its DNA double helix structure.Based upon this information alone, it can be determined that this change will greatly alter the information encoded by this genetic material.

- ⊙ true
- ⊙ false

MULTIPLE CHOICE - Choose the one alternative that best completes the statement or answers the question.

12) An atom has gained an electron; it has been _____.

A) oxidized
B) reduced
C) ionized
D) deionized
E) neutralized

13) Anything that occupies space and has mass is called _____.

A) atomic
B) living
C) matter
D) energy
E) space

14) The electrons of an atom are _____.

A) always equal to the number of neutrons in an atom
B) found in the nucleus
C) used to determine atomic number
D) positively charged
E) moving in pathways called orbitals

15) The electrons of an atom are _____.

A) always equal to the number of protons
B) used to determine the atomic weight
C) carrying a positive charge
D) used to determine the atomic number
E) always in full orbitals

16) All of the following pertain to the atom Carbon-14 except it _____.

A) has 6 protons
B) has 6 electrons
C) has 14 neutrons
D) is an isotope of carbon

17) The subatomic particles that surround the nucleus are the _____.

A) electrons

B) protons
C) neutrons
D) protons and neutrons
E) protons and electrons

18) What is the maximum number of electrons in the second energy shell of an atom?

A) 2
B) 4
C) 8
D) 18
E) 32

19) What is the maximum number of electrons in the first energy shell of an atom?

A) 2
B) 4
C) 8
D) 18
E) 32

20) Protons and neutrons make up the atom's central core, which is referred to as its _____.

A) valence number
B) isotope
C) nucleus
D) center of gravity

21) The valence number is the _____.

A) number of protons
B) number of neutrons
C) atomic weight
D) number of electrons in the innermost orbital
E) number of electrons in the outermost orbital

22) Two or more atoms bonded together are called a(n) _____.

A) ion
B) isotope
C) element
D) electrolyte
E) molecule

23) What would be the valence number of electrons in the sulfur (S) atom? Its atomic number is 16.

A) 2
B) 6
C) 8
D) 16
E) 32

24) 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

25) Organic chemicals always have a basic framework of the element _____ bonded to other atoms.

A) carbon
B) nitrogen
C) oxygen
D) hydrogen
E) phosphorous

26) $C_6H_{12}O_6 + C_6H_{12}O_6 \rightarrow C_{12}H_{22}O_{11} + H_2O$ represents _____.

A) the formation of a peptide bond
B) a decomposition reaction
C) a denaturation reaction
D) the formation

of a polysaccharide

E) a dehydration synthesis

27) Substances that release ions when dissolved in water and conduct electricity are _____.

A) covalent
B) nonpolar
C) electrons
D) electrolytes
E) solvents

28) A capillary tube is used to acquire a small blood sample for CBC (complete blood count) analysis. Suction is not required to transfer the blood from the fingertip prick to the tube in part due to _____.

A) ionic bonding between the water molecules
B) cohesive forces between the glass particles of the tube and the water molecules
C) covalent bonding between the water molecules
D) adhesive forces between the water molecules and the glass particles of the tube

29) Polar molecules are composed of covalently bonded _____.

A) identical atoms
B) carbon atoms
C) ions
D) atoms of different electronegativity
E) atoms of identical electronegativity

30) Covalent bonds _____.

A) result from losing electrons
B) are always polar
C) are always nonpolar
D) result from sharing electrons
E) result from gaining electrons

31) Cations are _____.

A) charged subatomic particles
B) atoms that have gained electrons
C) atoms that have gained neutrons
D) capable of forming ionic bonds with anions
E) atoms without protons

32) A reaction where an electron is lost is called _____.

A) oxidation
B) reduction
C) ionization
D) decomposition
E) dissolution

33) Ionic bonds _____.

A) result from sharing electrons
B) result from transferring electrons
C) result from like charge attraction
D) are the weakest chemical bonds
E) always involve carbon

34) Hydrogen bonds _____.

A) result from attractive forces between molecules with polar covalent bonds
B) result from attractive forces between molecules with polar ionic bonds
C) result from attractive forces between molecules with nonpolar covalent bonds
D) result from attractive forces between molecules with nonpolar ionic bonds
E) are the strongest bonds between molecules

35) Atoms that gain or lose electrons become charged particles called _____.

A) cations
B) anions
C) ions
D) isotopes

36) Which of the following represents a synthesis reaction?

A) $AB \rightarrow A + B$
B) $A + B \rightarrow AB$
C) $AB + XY \rightarrow AY + XB$
D) $AB + XY \leftrightarrow AY + XB$

37) Which of the following represents a reversible reaction?

A) $AB \rightarrow A + B$
B) $A + B \rightarrow AB$
C) $AB + XY \rightarrow AY + XB$
D) $AB + XY \leftrightarrow AY + XB$

38) Ionic compounds _____.

A) are hydrophobic
B) are hydrophilic
C) are acidic in solution
D) are basic in solution
E) always form salts in solution

39) The important solvent associated with living things is _____.

A) carbon dioxide
B) sodium chloride
C) ethyl alcohol
D) benzene
E) water

40) In the cell cytoplasm, molecules of ATP are a _____.

A) solute
B) solvent

41) Burning coal produces sulfur dioxide in the atmosphere. When combined with rain that falls into bodies of water, this leads to _____.

A) an increase in pH level of the water
B) a greater concentration of OH^- ions in the water
C) a decrease in the pH level of the water
D) no change in the pH level of the water

42) Compared to a solution of pH 9, a solution of pH 7 _____.

A) is more basic
B) has no OH^- ions
C) has more H^+ ions
D) has a higher pH

43) Compared to a solution of pH 9, a solution of pH 7 is _____.

A) 2 times more acidic
B) 20 times more acidic
C) 20 times more basic
D) 100 times more acidic
E) 100 times more basic

44) One techniquefor staining bacteria for viewing under the microscope is called theGram stain.In this technique, alcohol is used as a decolorizer because it degrades the outer membrane found insome bacteria.What chemical component of the cell does alcohol affect?

A) Protein
B) Carbohydrate
C) Lipid
D) Nucleic acids

45) What type of bond is formed by dehydration synthesis between two amino acids?

A) Glycosidic
B) Ester
C) Peptide
D) Disulfide
E) Phosphate

46) The purine _____always hydrogen bonds with the pyrimidine _____ indouble-stranded DNA.

A) guanine; cytosine
B) cytosine; guanine
C) adenine; guanine
D) thymine; guanine

47) In what way would life be different if the element carbon was absent?

A) There would be no organic compounds.
B) There would be no inorganic compounds.
C) Life would not exist in any shape or form.
D) The concept of pH would not exist.

48) 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

49) Which of the following functional groups is mismatched to the organic compound in which it is typically found?

A) Phosphate - carbohydrates
B) Sulfhydryl - proteins

C) Amino - proteins
D) Hydroxyl - alcohols
E) Carboxyl - fatty acids

50) Most biochemical macromolecules are polymers, which are chains of _____.

A) hydrophobic molecules
B) electrolytic molecules
C) repeating monomers
D) repeating carbohydrates
E) hydrogen bonds

51) All of the following are monosaccharides except _____.

A) glucose
B) glycogen
C) fructose
D) deoxyribose

52) Which of the following would have glycosidic bonds?

A) Triglycerides
B) Monosaccharides
C) Polypeptides
D) Polysaccharides
E) ATP

53) Starch is the primary storage food for all of the following except _____.

A) green plants
B) algae
C) animals
D) some fungi

54) Select the statement that most accurately reflects the process of plant material digestion in humans.

A) It is a very efficient process the produces very little undigested material in feces.

B) It is a process that is dependent upon enzyme (cellulase) production by gut microbiota.

C) It requires the action of enzymes called kinases.

D) It is linked to the digestion of glycogen.

55) All of the following are lipids except _____.

A) cholesterol

B) starch

C) phospholipid

D) wax

E) triglyceride

56) What part of a phospholipid comprises the hydrophobic tail?

A) Fatty acids

B) Glycerol

C) Phosphate

D) Alcohol

E) Hydroxyl

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

58) 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

59) An amino acid contains all of the following except a/an _____.

A) amino group
B) carboxyl group
C) variable R group
D) α carbon
E) phosphate

60) An example of an amphipathic molecule found in living cells is _____.

A) glucose
B) phospholipid
C) protein
D) nucleic acid
E) ATP

61) The lipid group that serves as energy storage molecules is the _____.

A) prostaglandins
B) waxes
C) phospholipids
D) steroids
E) triglycerides

62) All of the following are polysaccharides except _____.

A) dextran in some bacterial slime layers
B) agar used to make solid culture media
C) a cell's glycocalyx
D) cellulose in certain cell walls
E) sterols in cell membranes

63) The lipid group that is the major component of cell membranes is the _____.

A) prostaglandins
B) waxes
C) phospholipids

D) steroids
E) triglycerides

64) Which of the following statements is incorrect regarding protein structure?

A) The interaction between various R groups of amino acids determines the primary structure of a protein.
B) Beta-pleated sheets are a type of protein secondary structure.
C) The folding of a protein to form its active site creates its tertiary structure.
D) Proteins, such as antibodies that are comprised of multiple polypeptide chains, have quaternary structure.

65) Which of the following is not true about enzymes?

A) Enzymes are found in all cells.
B) Enzymes are catalysts.
C) Enzymes participate in the cell's chemical reactions.
D) Enzymes can be denaturated by heat and other agents.
E) Enzymes have high-energy bonds between phosphates.

66) The alpha (α)helix is a type of _____ protein structure.

A) primary
B) secondary
C) tertiary
D) quaternary

67) ATP differs from the nucleotides found in DNA in the _____.

A) sugar portion of the molecule
B) use of phosphate instead of sulfatein the backbone
C) use of phosphorus in the nitrogenous base portion of the molecule
D) use of adenosine instead of adenine
E) use of uracil in the nitrogenous base portion of the molecule

68) One nucleotide contains one _____.

A) phosphate
B) pentose sugar
C) nitrogen base
D) All of the choices are correct.

69) Purines and pyrimidines are components in the building block units of all _____.

A) nucleic acids
B) carbohydrates
C) polysaccharides
D) amino acids
E) enzymes

70) Which of the following is not a pyrimidine?

A) Uracil
B) Adenine
C) Thymine
D) Cytosine

71) Which pertains to DNA but not to RNA?

A) Contains ribose
B) Contains adenine
C) Contains thymine
D) Contains uracil
E) Contains nucleotides

72) Which of the following is a correct description of a component of the ATP molecule?

A) Sugar: deoxyribose
B) Nitrogenous base: alanine
C) High energy bond:peptide bond
D) Sugar: ribose
E) High energy bond: glycosidic bond

73) ATP is best described as _____.

A) an enzyme
B) a double helix
C) an electron carrier
D) the energy molecule of cells

74) A culture of an organism believed to cause intestinal symptoms is viewed under the microscope, and the microbiologist observes a cell membrane, flagella, mitochondria, and some dark unrecognizable structures within each cell. The microbiologist notes that the cells are eukaryotic because _____.

A) only eukaryotic cells have a cell membrane
B) only eukaryotic cells have mitochondria
C) only eukaryotic cells have flagella
D) the dark structures must be the cell nuclei

75) NASA has published a list of criteria for identifying fossil bacteria in samples from Mars, as part of a search for evidence of life. Which of the following is good evidence for the presence of bacterial cells?

A) Cell size of 0.5 to 2 microns
B) Three-dimensional organization of cells in a starburst pattern
C) Absence of carbon in the material
D) No evidence of water in the surrounding mineral

76) 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 the choices are correct.

77) All cells contain _____.

A) ribosomes for protein synthesis
B) cell walls made of cellulose
C) uracil in their DNA
D) organelles for compartmentalization
E) mitochondria to generate ATP

Answer Key

Test name: CH-02: Test Bank Microbiology

1) FALSE

2) FALSE

3) TRUE

4) FALSE

5) FALSE

6) TRUE

7) TRUE

8) FALSE

9) FALSE

10) TRUE

11) FALSE

12) B

13) C

14) E

15) A

16) C

17) A

18) C

19) A

20) C

21) E

22) E

23) B

24) B

25) A

26) E

27) D

28) D

29) D

30) D

31) D

32) A

33) B

34) A

35) C

36) B

37) D

38) B

39) E

40) A

41) C

42) C

43) D

44) C

45) C

46) A

47) A

48) C

49) A

50) C

51) B

52) D

53) C

54) B

55) B

56) A

57) D

58) E

59) E

60) B

61) E

62) E

63) C

64) A

65) E

66) B

67) A

68) D

69) A

70) B

71) C

72) D

73) D

74) B

75) A

76) D

77) A