

Microbiology / Active Lecture Questions
Chapter 2 – Chemical Principles

1 Chapter 2 – Chemical Principles

2 Assume E. coli are grown in a nutrient medium containing the radioisotope ^{16}N . After a 48-hour incubation period, the ^{16}N would most likely be found in the E. coli's

- a. carbohydrates.
- b. lipids.
- c. proteins.
- d. water.
- e. none of the above

3 If Pseudomonas bacteria are supplied with radioactively labeled cytosine, after a 24-hour incubation period this cytosine would most likely be found in the cells'

- a. carbohydrates.
- b. DNA.
- c. lipids.
- d. water.
- e. proteins.

4 If E. coli were grown in a medium containing the radioactive isotope ^{32}P , the ^{32}P would be found in all of the following molecules of the cell except

- a. ATP.
- b. carbohydrates.
- c. DNA.
- d. plasma membrane.
- e. none of the above.

5 A carbonated drink, pH 3, is _____ times more acid than distilled water.

- a. 4
- b. 10
- c. 100
- d. 1000
- e. 10,000

6 The best definition of ATP is that it is:

- a. a molecule stored for food use.
- b. a molecule that supplies energy to do work.
- c. a molecule stored for an energy reserve.
- d. a molecule used as a source of phosphate.

7 Which of the following is an organic molecule?

- a. H_2O (water)
- b. O_2 (oxygen)
- c. $\text{C}_{18}\text{H}_{29}\text{SO}_3$ (Styrofoam)
- d. FeO (iron oxide)
- e. $\text{F}_2\text{C} = \text{CF}_2$ (Teflon)

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8 What is the smallest component of a pure substance that exhibits physical and chemical properties of that substance?

- a. Nucleus
- b. Molecule
- c. Atom
- d. Element

9 Atoms with different numbers of neutrons in their nuclei are called

- a. Molecules
- b. Elements
- c. Isotopes
- d. Compounds

10 An isotope of oxygen has an atomic number of 8 and an atomic weight of 18. How many neutrons does it have?

- a. 18
- b. 7
- c. 8
- d. 10

[Atomic Wt = p + n, Atomic Number = p, n = Atomic Wt – Atomic Number]

11 Adenosine triphosphate is hydrolyzed to become

- a. ADP
- b. AMP
- c. cAMP
- d. Inorganic phosphate

12 A bond formed from the attraction between ions of opposite charge is called

- a. An ionic bond
- b. A covalent bond
- c. A peptide bond
- d. A hydrogen bond

13 What is formed by sharing electrons?

- a. Compound
- b. Ionic bond
- c. Hydrogen bond
- d. Covalent bond

14 Water has an unequal distribution of charges and is called

- a. An ionic molecule
- b. A polar molecule
- c. A covalent molecule
- d. An organic molecule

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15 Acidic solutions have

- a. A pH of less than 7
- b. A pH of greater than 7
- c. A pH of 7
- d. An equal number of hydrogen and hydroxide ions

16 Which type of bond exists between adjacent molecules of water?

- a. Ionic bond
- b. Covalent bond
- c. Hydrogen bond
- d. Peptide bond

17 Sucrose can be hydrolyzed into

- a. Dextrans
- b. Two glucoses
- c. Glucose and galactose
- d. Glucose and fructose

18 Enzymes are substances that speed up biological reactions and are

- a. Carbohydrates
- b. Lipids
- c. Proteins
- d. Nucleic acids

19 In a decomposition reaction,

- a. A larger molecule is broken down into its component molecules, ions, or atoms
- b. Two molecules are decomposed, and their subunits are used to synthesize two new molecules
- c. The products can readily revert to form the original reactants
- d. Atoms, ions, or molecules are combined to form a larger molecule

20 Which of the following are the “building blocks” of proteins?

- a. Amino acids
- b. Fatty acids
- c. Peptides
- d. Nucleotides

21 Which of the following nitrogenous bases is NOT found in an RNA molecule?

- a. Adenine
- b. Guanine
- c. Thymine
- d. Uracil

22 Which type of molecule is made from the formula $(CH_2O)_N$

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- a. carbohydrate
- b. nucleic acid
- c. lipid
- d. protein

23 Glucose, sucrose, and cellulose are examples of

- a. Carbohydrates
- b. Disaccharides
- c. Polysaccharides
- d. Polypeptides