

These review questions for the Chemistry lecture were adapted from several sources, including 1700+ Review Questions for Anatomy and Physiology II (3rd edition) by R. Michael Anson, Ph.D.

Multiple choice review questions: When a question below mentions a specific atom or molecule, be able to answer the question for any atom or molecule. In other words, different example atoms and molecules may be used on exams.

- 1) The smallest particles of matter
 - A) Molecules
 - B) Cells
 - C) Water
 - D) Atoms

- 2) What is the atomic symbol for a nitrogen atom?
 - A) N
 - B) Ni
 - C) Nitro
 - D) Na

- 3) Which atom has the atomic symbol S?
 - A) Sodium
 - B) Sulfur
 - C) Silicon
 - D) Cells

- 4) Which atom has the atomic symbol Na?
 - A) Sodium
 - B) Sulfur
 - C) Silicon
 - D) Cells

- 5) The term for any particle made of atoms joined together
 - A) Atomic symbol
 - B) Ion
 - C) Molecule
 - D) Formula

- 6) A covalent bond is
 - A) what holds atoms together in molecules
 - B) the force that causes atoms to ionize
 - C) the product of a chemical reaction
 - D) the arrow in a chemical reaction

- 7) What is the molecular formula of this molecule? $\begin{array}{c} \text{H-O-C-O-H} \\ || \\ \text{O} \end{array}$
- A) $\text{1C}^3\text{H}^2\text{O}$
 B) CHO
 C) CHHOOO
 D) CH_2O_3
- 8) What is the molecular formula for three of this molecule? $\text{O}=\text{C}=\text{O}$
- A) $\text{O}_3\text{C}_3\text{O}_3$
 B) C_3O_6
 C) 3CO_2
 D) C^3O_2^3
- 9) The term for any atom or molecule with an electric charge
- A) Molecular formula
 B) Ion
 C) Metabolite
 D) Covalent
- 10) Calcium ions have the symbol
- A) Ca^-
 B) Ca^{2+}
 C) Ca^{2-}
 D) Ca^+
- 11) The molecular formula for bicarbonate ion is
- A) HCO_3^-
 B) C_2^+
 C) 2C^+
 D) 2CO_2
- 12) A chemical reaction is defined as
- A) When molecules become ions
 B) When atoms become a molecule
 C) When atoms are destroyed or created
 D) When molecules are changed
- 13) The molecules that **enter** a chemical reaction are called the _____ molecules.
- A) Initial molecules
 B) Products
 C) Reactants
 D) Initials

14) When writing a chemical reaction, what symbol is written in the middle (between the reactant molecules and the product molecules)?

- A) + (plus sign)
- B) - (minus sign)
- C) -> (arrow sign)
- D) = (equals sign)

15) The term that means all the chemical reactions in the body

- A) Activism
- B) Homeostasis
- C) Metabolism
- D) Anatomy

Answers to multiple-choice questions:

- 1 = D
- 2 = A
- 3 = B
- 4 = A
- 5 = C
- 6 = A
- 7 = D
- 8 = C
- 9 = B
- 10 = B
- 11 = A
- 12 = D
- 13 = C
- 14 = C
- 15 = C

Fill-in-the-blank review questions: When a question below mentions a specific atom or molecule, be able to answer the question for any atom or molecule. In other words, different example atoms and molecules may be used on exams.

1) Write the correct atomic symbol for the following atoms

Nitrogen = _____

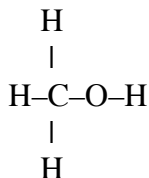
Chlorine= _____

2) The four most abundant elements in the human body are _____, _____, _____, _____.

3) When two or more atoms are held together by bonds, the resulting particle is called a _____.

4) _____ bonds are shown as a line connecting atoms.

5) Inspect the molecule below then answer the questions about it.



- a) The lines that join the atoms in the molecule are called _____.
- b) Write the molecular formula for the molecule: _____.
- c) Write the molecular formula that represents five of these molecules: _____.
- 6) Ions are also called _____, because they can carry an electric current.
- 7) Name any two common ions in the human body. Your list must include the correct atomic symbol or molecular formula for each ion, including its correct ionic charge.
- 8) The sodium in the body is always an ion. Write its correct atomic symbol, including its correct ionic charge: _____
- 9) What is the name of the ion PO_4^{3-} ? _____
- 10) _____ refers to the total of all the chemical reactions which occur within the body.
- 11) True or false: The number of molecules does not change in a chemical reaction.
- 12) True or false: The number of atoms does not change in a chemical reaction.
- 13) The molecules that enter a chemical reaction are called the _____, while the molecules that are formed in the chemical reaction are called the _____.
- 14) The term _____ means the total of all the chemical reactions which occur within the body.

Answers to fill-in-the-blank review questions:

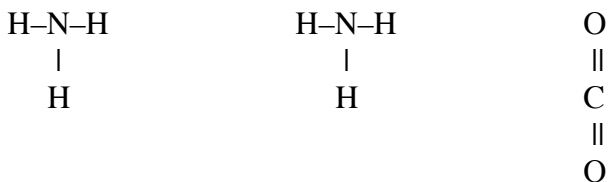
- | | |
|-------------------|------------------------------------|
| 1) N | |
| Cl | |
| 2) C (Carbon) | 7) Any two answers from this list: |
| H (Hydrogen) | Na^+ |
| O (Oxygen) | K^+ |
| N (Nitrogen) | H^+ |
| 3) Molecule | Cl^- |
| 4) Covalent bonds | Ca^{2+} |
| 5) Covalent bonds | Fe^{2+} |
| COH_4 | OH^- |
| 5COH_4 | HCO_3^- |
| 6) Electrolytes | PO_4^{3-} |
| | 8) Na^+ |

- 9) Phosphate ion
- 10) Metabolism
- 11) False
- 12) True

- 13) Reactants
Products
- 14) Metabolism

Short answer review questions:

- 1) What is the definition of an ion?
- 2) What is the definition of a chemical reaction?
- 3) In the liver, the following three molecules react with each other:



...to form the following two molecules:



Write the chemical reaction in the space below. Your answer must have all the proper molecular formulas and be in the proper format for a chemical reaction.

Answers to short answer review questions:

- 1) An ion is an electrically charged atom or molecule.
- 2) A chemical reaction is when molecules are changed (their atoms become rearranged into new molecules).
- 3) $2\text{NH}_3 + \text{CO}_2 \rightarrow \text{CON}_2\text{H}_4 + \text{H}_2\text{O}$