Name _____ Date _____

Atoms, Elements and the Periodic Table: Protons, Neutrons, Electrons and Isotopes

Directions: Answer each question. In number questions, type only the number; the unit is shown next to the box.

1. Scientists use each of these terms when they describe the structure of an atom. Match each term to its meaning in the model of an atom.

Write the letter of the matching answer on each line.

1. _____ Proton
2. _____ Neutron
3. _____ Electron
4. _____ Atomic number
5. _____ Isotopes

Choices for question 1

A. Atoms of different elements that have the same mass
B. The total number of particles in an atom
C. A particle with a positive charge, found in the nucleus of every atom
D. A particle with no electric charge, found in the nucleus
E. The number of protons in an atom's nucleus
F. Atoms of the same element that have different numbers of neutrons
G. A particle with a negative charge

2. A student compares three atoms. Atom A has 6 protons and 8 neutrons, Atom B has 6 protons and 6 neutrons, and Atom C has 7 protons and 7 neutrons. Which statement about these atoms is correct?

A. Atoms A and C are the same element, because each has 14 protons and neutrons in all.
B. Atoms B and C are the same element, because each has equal numbers of protons and neutrons.
C. All three are different elements, because their numbers of neutrons are all different.
D. Atoms A and B are the same element, because they have the same number of protons.

3. An atom of chlorine contains 17 protons and 18 neutrons, and the atom has no overall electric charge. How many electrons does this chlorine atom contain?

_____ electrons

4. A potassium atom contains 19 protons and starts out with no overall electric charge. It then loses one electron, which leaves it with exactly as many electrons as a neutral argon atom. What is the particle now?

A. A different isotope of potassium, because it changed

B. An argon atom, because it now has the same number of electrons as argon

C. A neutral atom, because losing an electron does not change its charge

D. A potassium ion with a positive charge, still potassium because it still has 19 protons

5. Which description of electrons fits the model of the atom that scientists use today?

A. Electrons sit still inside the nucleus, packed in with the protons.

B. Electrons travel in fixed circular paths around the nucleus, like planets around the Sun.

C. Electrons move in regions around the nucleus where they are likely to be found, often pictured as a cloud.

D. Electrons are heavier than protons and pull the nucleus around with them.

6. Almost all of an atom's mass is concentrated in one small part of the atom. Where is that mass located, and what explains it?

A. Spread evenly through the whole atom, because all its particles weigh the same

B. In the nucleus, because each proton and neutron has far more mass than an electron

C. In the empty space between the particles

D. In the electrons, because they fill most of the atom's space

7. How are the elements arranged in the modern periodic table?

A. From heaviest to lightest by mass alone

B. In the order in which they were discovered

C. In alphabetical order by their names

D. In order of increasing atomic number, with elements that have similar properties in the same column

8. A chemical formula shows the atoms in one molecule; a water molecule, H_2O, has 2 hydrogen atoms and 1 oxygen atom. How many atoms in all are in one molecule of glucose, $C_6H_{12}O_6$?

_____ atoms