

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

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

1) In the calcium atom represented by the symbol  ${}^{40}_{20}\text{Ca}$ , there are 20 protons, 20 neutrons, and 20 electrons.

- true
- false

**Question Details**

Gradable : automatic

null : Section number: 02.01

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

Subtopic : Atomic Number, Mass Number, Atomic Symbol and Isotopes

Difficulty : Medium

2) All atoms of a particular element have identical chemical properties.

- true
- false

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

null : Section number: 02.01

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

3) An atom cannot be created, divided, destroyed, or converted to any other type of atom.

- true
- false

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

null : Section number: 02.01

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

4) The atomic number of an atom indicates the number of protons that are present.

- true
- false

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

null : Section number: 02.01

Topic : Atoms and the Periodic Table (Components of Matter)

Subtopic : Atomic Number, Mass Number, Atomic Symbol and Isotopes

5) If an atom gains one electron, it becomes an anion.

- true
- false

**Question Details**

Accessibility : Keyboard Navigation

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

null : Section number: 02.06

Subtopic : Valence Electrons

6) The first experimentally based theory of atomic structure was proposed by John Dalton.

- true
- false

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.02

Subtopic : Atomic Theories

Subtopic : Structure of the Atom

7) J. J. Thomson was the first to state that an atom is mostly empty space.

- true
- false

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.02

Subtopic : Atomic Theories

Subtopic : Structure of the Atom

8) Bohr was the first to use the term "orbit" to explain the fixed energy levels of electrons.

- true
- false

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Subtopic : Atomic Theories

null : Section number: 02.03

Subtopic : Structure of the Atom

9) Niels Bohr developed a theory that accounted for the lines in the visible region of the hydrogen spectrum.

- true  
 false

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Subtopic : Atomic Theories

null : Section number: 02.03

Subtopic : Structure of the Atom

**10)** In Mendeleev's table, the elements were arranged according to their atomic mass.

- true  
 false

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.04

**11)** There are nine periods on the periodic table.

- true  
 false

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.04

**12)** Sulfur (S) is one of the representative elements.

- true  
 false

**Question Details**

Accessibility : Keyboard Navigation

Difficulty : Easy

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

null : Section number: 02.04

**13)** Europium (Eu) is a lanthanide element.

- true  
 false

**Question Details**

Accessibility : Keyboard Navigation

Difficulty : Easy

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

null : Section number: 02.04

**14)** Arsenic (As) is a metalloid.

- true  
 false

**Question Details**

Accessibility : Keyboard Navigation

Difficulty : Easy

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

null : Section number: 02.04

**15)** Valence electrons are involved when atoms form bonds.

- true  
 false

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.06

Subtopic : Valence Electrons

**16)** Atoms of the noble gas elements, Group VIII A (18), do not readily bond to other elements.

- true  
 false

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.06

Subtopic : Valence Electrons

**17)** There are eight valence electrons in a chlorine anion.

- true  
 false

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

Difficulty : Medium

null : Section number: 02.06

Subtopic : Valence Electrons

**18)** The ions formed from Group IIA (2) atoms have charges of 2-.

- true  
 false

**Question Details**

Accessibility : Keyboard Navigation  
Gradable : automatic  
Topic : Atoms and the Periodic Table (Components of Matter)  
Bloom's : Understand  
Difficulty : Medium  
null : Section number: 02.06  
Subtopic : Valence Electrons

19) Cations tend to be formed from metal atoms, while anions are formed from non-metal atoms.

- true  
 false

**Question Details**

Accessibility : Keyboard Navigation  
Bloom's : Remember  
Difficulty : Easy  
Gradable : automatic  
Subtopic : Elements and the Periodic Table  
Topic : Atoms and the Periodic Table (Components of Matter)  
null : Section number: 02.06  
Subtopic : Valence Electrons

20) The atoms of smallest radius are those of elements in the top left hand part of the periodic table.

- true  
 false

**Question Details**

Accessibility : Keyboard Navigation  
Bloom's : Remember  
Difficulty : Easy  
Gradable : automatic  
Topic : Atoms and the Periodic Table (Components of Matter)  
null : Section number: 02.07  
Subtopic : Trends in the Periodic Table

21) The halogens, Group VII A (17), have the lowest ionization energies of any group in the periodic table.

- true  
 false

**Question Details**

Accessibility : Keyboard Navigation

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

null : Section number: 02.07

Subtopic : Trends in the Periodic Table

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

22) What are the three primary particles found in an atom?

- A) neutron, positron, and electron  
B) electron, neutron, and proton  
C) electron, proton, and nucleon  
D) positron, electron, and nucleon  
E) proton, electron, and neutrino

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

null : Section number: 02.01

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

23) What is the value of the mass number in the isotope  ${}_{53}^{131}\text{I}$ ?



- A) 53
- B) 78
- C) 126.9
- D) 131
- E) 184

**Question Details**

Accessibility : Keyboard Navigation

Difficulty : Easy

Gradable : automatic

null : Section number: 02.01

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

Subtopic : Atomic Number, Mass Number, Atomic Symbol and Isotopes

**24)** What term is used to describe atoms of the same element that have different masses?

- A) radioactive
- B) constituents
- C) isotopes
- D) telomers
- E) isomers

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

null : Section number: 02.01

Topic : Atoms and the Periodic Table (Components of Matter)

Subtopic : Atomic Number, Mass Number, Atomic Symbol and Isotopes

**25)** Which statement explains why isotopes have different mass numbers?

- A) Isotopes differ in the number of protons each contains.
- B) Isotopes differ in the number of electrons each contains.
- C) Isotopes differ in the number of neutrons each contains.
- D) Isotopes differ in the number of protons and neutrons each contains.
- E) Isotopes differ in the number of protons and electrons each contains.

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

null : Section number: 02.01

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

Subtopic : Atomic Number, Mass Number, Atomic Symbol and Isotopes

Difficulty : Medium

**26)** When a neutral atom gains one or more electrons, what type of particle is formed?

- A) an anion
- B) an isotope
- C) a proton
- D) a positron
- E) a cation

**Question Details**

Accessibility : Keyboard Navigation

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

null : Section number: 02.06

Subtopic : Valence Electrons

**27)** What is always true for a neutral atom?

- A) There is an equal number of protons and neutrons.
- B) There is an equal number of protons and electrons.
- C) There is an equal number of protons, neutrons, and electrons.
- D) The number of protons and neutrons is an even number.
- E) The number of protons, neutrons, and electrons is an even number.

**Question Details**

Accessibility : Keyboard Navigation

Difficulty : Easy

Gradable : automatic

null : Section number: 02.01

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

Subtopic : Atomic Number, Mass Number, Atomic Symbol and Isotopes

**28)** What was J. J. Thomson's important discovery about cathode rays in 1897?

- A) Cathode rays were indestructible.
- B) Cathode rays were heavier than anode rays.
- C) Cathode rays consisted of a stream of electrons.
- D) Cathode rays were produced by all radioactive atoms.
- E) Cathode rays were able to initiate radioactive decay of an atom.

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.02

Subtopic : Atomic Theories

**29)** What is Rutherford's important contribution to our knowledge of atomic structure?

- A) Atoms contain a small, dense, positively charged nucleus, surrounded largely by empty space.
- B) The atom cannot be created, divided, destroyed, or converted to any other type of atom.
- C) Electrons in an atom have the magnetic property of spin.
- D) Electrons are confined to certain specific regions of space outside the nucleus.
- E) Electrons follow circular paths around the nucleus of an atom.

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Difficulty : Medium

null : Section number: 02.02

Subtopic : Atomic Theories

**30)** Which statement concerning atoms is FALSE?

- A) The atomic number of an atom is the number of protons it contains.
- B) The mass number of an atom is the sum of the number of protons, neutrons, and electrons it contains.
- C) The nucleus of an atom contains its protons and neutrons, and is positively charged.
- D) The nucleus of an atom is the heaviest part of the atom.
- E) Electrons reside outside the nucleus in what is called the electron cloud.

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Gradable : automatic

null : Section number: 02.01

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

Subtopic : Atomic Number, Mass Number, Atomic Symbol and Isotopes

Difficulty : Medium

**31)** Which describes the basic concept of Bohr's theory of the atom?

- A) Atoms contain a small, dense positively charged region called the nucleus.
- B) The energy of an electron in an atom is quantized; it has only certain allowable values.
- C) Light is made up of particles called photons.
- D) Electrons have the magnetic property of spin.
- E) Radioactive atoms spontaneously decay and release large amounts of energy from the nucleus.

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Difficulty : Medium

Subtopic : Atomic Theories

null : Section number: 02.03

Subtopic : Structure of the Atom

**32)** When is an atom in its ground state?

- A) when the electrons of the atom are in the lowest possible energy levels
- B) when an atom loses all of its electrons to form a noble gas
- C) when the electrons of the atom are in the highest possible energy levels
- D) when an electron is promoted to a higher energy level, farther from the nucleus
- E) when the electrons of an atom spontaneously emit energy in the form of a photon

**Question Details**

Accessibility : Keyboard Navigation

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

null : Section number: 02.03

Subtopic : Electronic Structure

Subtopic : Orbital Diagrams

**33)** The identity of an atom is determined by which of the following?

- A) the number of electrons it contains
- B) its mass number
- C) the number of isotopes it has
- D) the number of protons it contains
- E) the number of protons and neutrons it contains

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

null : Section number: 02.01

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

**34)** In modern atomic theory, Bohr's orbits are replaced by atomic orbitals. What is an atomic orbital?

- A) a circular path around the nucleus travelled by an electron
- B) a dense, positively charged region of space at the center of an atom
- C) a region of space within an atom where there is a high probability of finding an electron
- D) the outermost principle energy level in an atom
- E) the lowest energy arrangement of electrons in an atom

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.03

Subtopic : Structure of the Atom

Subtopic : Electronic Structure

**35)** Which two scientists in 1869 arranged the elements in order of increasing atomic masses to form a precursor of the modern periodic table of elements?

- A) Bohr and Rutherford
- B) Plank and Rutherford
- C) Maxwell and Dalton
- D) Thomson and Crookes
- E) Mendeleev and Meyer

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.04

**36)** Who stated that the elements, when arranged according to their atomic masses, showed a distinct periodicity of their properties?

- A) Dmitri Mendeleev
- B) Niels Bohr
- C) J.J Thomson
- D) Ernest Rutherford
- E) John Dalton

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.04

**37)** Which statement about the modern periodic table is FALSE?

- A) Elements are arranged in order of increasing atomic number.
- B) A period is a horizontal row of elements.
- C) A group is a vertical column of elements.
- D) A stepwise line separates the metals from the nonmetals; metals are to the left of the line, nonmetals are to the right of the line.
- E) Elements in the same period share similar chemical and physical properties.

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

Difficulty : Medium

null : Section number: 02.04

**38)** The modern periodic law states that the physical and chemical properties of the elements are periodic functions of what property?

- A) electrons
- B) atomic weight
- C) neutrons
- D) atomic number
- E) mass number

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

Subtopic : Atomic Number, Mass Number, Atomic Symbol and Isotopes

null : Section number: 02.04

**39)** The ion  $K^+$  is formed by which process?



- A) loss of an electron by K
- B) gain of a proton by K
- C) loss of a proton by K
- D) gain of an electron by K
- E) None of these are correct.

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

Difficulty : Medium

null : Section number: 02.06

Subtopic : Valence Electrons

**40)** Tungsten is a metal containing 74 protons, and is used widely in the electronics industry. What is the chemical symbol for tungsten?

- A) T
- B) Tg
- C) Tn
- D) W
- E) As

**Question Details**

Accessibility : Keyboard Navigation

Difficulty : Easy

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

Subtopic : Atomic Number, Mass Number, Atomic Symbol and Isotopes

null : Section number: 02.04

**41)** Which period contains the element sodium?

- A) one
- B) two
- C) three
- D) five
- E) eleven

**Question Details**

Accessibility : Keyboard Navigation

Difficulty : Easy

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

null : Section number: 02.04

**42)** What are the columns of elements on the periodic table called?

- A) groups
- B) shells
- C) periods
- D) metals
- E) rows

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.04

**43)** Which statement concerning the elements fluorine, chlorine, bromine, and iodine is FALSE?

- A) They are all halogens.
- B) They all have the same electron configuration.
- C) They are all nonmetals.
- D) They are all representative elements.
- E) They all have the same number of valence electrons.

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

Difficulty : Medium

null : Section number: 02.06

Subtopic : Valence Electrons

Bloom's : Analyze

Subtopic : Electron Configuration

**44)** What is the general name given to the elements of Group IA (1)?

- A) halogens
- B) alkali metals
- C) alkaline earth metals
- D) noble gases
- E) metalloids

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.04

**45)** What term is used for the elements straddling the "staircase" boundary between the metals and nonmetals?

- A) transition elements
- B) metalloids
- C) cations
- D) lanthanides
- E) noble gases

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.04

**46)** What are valence electrons?

- A) the electrons located in the nucleus of an atom
- B) the interior electrons, located closest to the nucleus
- C) the outermost electrons in an atom
- D) the electrons with the lowest energy in an atom
- E) the total number of electrons in an atom

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.06

Subtopic : Valence Electrons

**47)** What is FALSE about the three orbitals in the 2 *p* sublevel?

- A) The orbitals have the same dumbbell-like shape.
- B) The orbitals have similar, but different energies.
- C) The orbitals are the same distance away from the nucleus.
- D) The orbitals are each oriented in a different direction.
- E) Each orbital can hold two electrons with opposite spins.

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Difficulty : Medium

Subtopic : Electronic Structure

null : Section number: 02.05

**48)** What requirement must be met in order for two electrons to coexist in the same orbital?

- A) The electrons must have different energies.
- B) The electrons must have the same spin.
- C) The electrons must have opposite charges.
- D) The electrons must be in different principle energy levels.
- E) The electrons must have opposite spins.

**Question Details**

Accessibility : Keyboard Navigation

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

Subtopic : Electronic Structure

null : Section number: 02.05

**49)** The Aufbau Principle specifies which of the following?

- A) Each atomic orbital has a maximum capacity of two electrons.
- B) Two electrons in the same orbital must have opposite spins.
- C) Two electrons in the same orbital must be spin paired.
- D) Electrons will occupy the lowest energy orbitals that are available.
- E) Electrons will half-fill orbitals of equal energy, before any become completely filled.

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

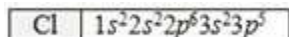
Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Subtopic : Electronic Structure

null : Section number: 02.05

**50)** The ground state electron configuration of chlorine is shown. Which statement concerning an atom of chlorine is FALSE?



- A) A chlorine atom has 17 total electrons.
- B) The outermost energy level in a chlorine atom is  $n=3$ .
- C) A chlorine atom has 5 valence electrons.
- D) A chlorine atom needs one electron to obtain an octet in its outermost energy level.
- E) A chlorine atom has 17 protons.

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

null : Section number: 02.06

Subtopic : Valence Electrons

Subtopic : Electronic Structure

Subtopic : Electron Configuration

Difficulty : Hard

51) In nature, the element neon exists as three different isotopes: Ne-20, Ne-21, and Ne-22. Which isotope would be the most abundant in a sample of neon?

- A) Ne-20
- B) Ne-21
- C) Ne-22
- D) All isotopes would be equally abundant.
- E) It is impossible to determine.

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

null : Section number: 02.01

Topic : Atoms and the Periodic Table (Components of Matter)

Subtopic : Atomic Number, Mass Number, Atomic Symbol and Isotopes

Difficulty : Medium

Bloom's : Analyze

52) How many valence electrons are present in a chloride ion, Cl<sup>-</sup>?

- A) 5
- B) 7
- C) 8
- D) 17
- E) 18

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

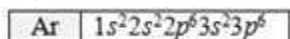
Difficulty : Medium

null : Section number: 02.06

Subtopic : Valence Electrons

Bloom's : Apply

53) Which statement correctly describes the basis for the octet rule?



- A) Atoms strive to attain eight protons in their nucleus to attain the stability of the nearest noble gas.
- B) Atoms have a tendency to form eight bonds with other atoms to attain the stability of a noble gas.
- C) Atoms will lose, gain, or share eight electrons to become a noble gas.
- D) Atoms are most stable with eight electrons in their outermost shell and the electron configuration of a noble gas.
- E) Atoms are most stable when the number of protons they contain is identical to the noble gas closest to them in the periodic table.

#### Question Details

Accessibility : Keyboard Navigation

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

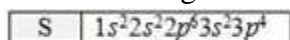
Difficulty : Medium

null : Section number: 02.06

Subtopic : Valence Electrons

Subtopic : Electron Configuration

54) Which ion is NOT isoelectronic (i.e. has the same electron configuration) with Ar? The electron configuration of Ar is shown.



- A)  $\text{Cl}^-$
- B)  $\text{K}^+$
- C)  $\text{Br}^-$
- D)  $\text{Ca}^{2+}$
- E)  $\text{S}^{2-}$



**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.06

Subtopic : Valence Electrons

Bloom's : Analyze

Subtopic : Electron Configuration

Difficulty : Hard

55) The ground state electron configuration of a sulfur atom is shown below. What is the ground state electron configuration of the ion  $S^{2-}$ ?

- A)  $1s^2 2s^2 2p^6 3s^0 3p^4$
- B)  $1s^2 2s^2 2p^6 3s^2 3p^6$
- C)  $1s^2 2s^2 2p^6 3s^2 3p^2$
- D)  $1s^2 2s^2 2p^6$
- E)  $1s^2 2s^2 2p^6 3s^3 3p^5$

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Difficulty : Medium

null : Section number: 02.06

Subtopic : Valence Electrons

Subtopic : Electron Configuration

Bloom's : Apply

56) Atoms with the biggest radii occur in the \_\_\_\_\_ region of the periodic table.

- A) bottom left
- B) top right
- C) bottom right
- D) top left
- E) middle

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.07

Subtopic : Trends in the Periodic Table

57) Which *best* explains why an  $\text{Al}^{3+}$  ion is smaller than an Al atom?

A) In forming the  $\text{Al}^{3+}$  ion, the Al atom loses the electrons in its outermost energy level, causing a decrease in the atomic radius.

B) In forming the  $\text{Al}^{3+}$  ion, the Al atom gains three protons and the resulting net positive charge keeps the electrons more strongly attracted to the nucleus, reducing the radius.

C) The  $\text{Al}^{3+}$  ion contains more electrons than the Al atom, which results in a greater attraction for the nucleus and a smaller atomic radius.

D) In forming the  $\text{Al}^{3+}$  ion, the Al atom adds electrons into a higher energy level, causing a decrease in the atomic radius.

E) There are more protons in an  $\text{Al}^{3+}$  ion than there are in an Al atom.

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

Subtopic : Electronic Structure

Difficulty : Hard

null : Section number: 02.07

Subtopic : Trends in the Periodic Table

58) Which element is a halogen in period 4?

- A) bromine
- B) silicon
- C) iodine
- D) krypton
- E) potassium

**Question Details**

Accessibility : Keyboard Navigation

Difficulty : Easy

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

null : Section number: 02.04

**59)** Hydrogen can form two different ions: a hydrogen ion ( $\text{H}^+$ ), and a hydride ion ( $\text{H}^-$ ). Which statement concerning these ions is FALSE?

- A) The  $\text{H}^+$  ion is a cation formed by the loss of one electron; this ion has no valence electrons.
- B) The  $\text{H}^-$  ion is an anion formed by the gain of one electron; this ion has a full  $n=1$  energy level.
- C) The hydrogen ion and the hydride ion are isotopes.
- D) The hydrogen ion and the hydride ion have the same number of protons.
- E) The hydrogen ion and the hydride ion have different sizes.

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Subtopic : Atomic Number, Mass Number, Atomic Symbol and Isotopes

null : Section number: 02.06

Subtopic : Valence Electrons

Subtopic : Electronic Structure

Bloom's : Analyze

Difficulty : Hard

60) The element carbon forms the basis of study in Organic Chemistry. Which statement about the element carbon is FALSE?

- A) Carbon is a period 2 element.
- B) Carbon is a group 4 element.
- C) Carbon is a nonmetal.
- D) Carbon atoms have six valence electrons.
- E) Carbon atoms have six protons.

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

Difficulty : Medium

null : Section number: 02.06

Subtopic : Valence Electrons

61) What does the mass number minus the atomic number represent?

- A) number of protons
- B) number of electrons
- C) number of neutrons
- D) number of protons - number of neutrons
- E)  $\text{number of neutrons} - \text{number of protons}$

**Question Details**

Accessibility : Keyboard Navigation

Difficulty : Easy

Gradable : automatic

null : Section number: 02.01

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

Subtopic : Atomic Number, Mass Number, Atomic Symbol and Isotopes

62) In a neutral atom, what number equals the number of electrons?

- A) atomic number
- B) mass number
- C) mass number minus the atomic number
- D) atomic number and mass number minus the atomic number are correct.
- E) None of the choices are correct.

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

null : Section number: 02.01

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

Subtopic : Atomic Number, Mass Number, Atomic Symbol and Isotopes

**63)** <p>Given that helium has an isotope  ${}^3\text{He}$ , how many electrons does an atom of this helium isotope contain?

- A) 1
- B) 2
- C) 4
- D) 6
- E) 0

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

null : Section number: 02.01

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

Subtopic : Atomic Number, Mass Number, Atomic Symbol and Isotopes

Difficulty : Medium

Bloom's : Analyze

**64)** <p>How many neutrons are present in an atom of the isotope  ${}^7_3\text{Li}$ ?

- A) 3
- B) 4
- C) 7
- D) 10
- E) None of the choices are correct.

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

null : Section number: 02.01

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

Subtopic : Atomic Number, Mass Number, Atomic Symbol and Isotopes

Difficulty : Medium

Bloom's : Apply

**65)** Microwaves, light, and X-rays are all forms of

- A) electricity.
- B) high energy electrons.
- C) electron repulsion.
- D) electromagnetic radiation.
- E) radioactivity.

**Question Details**

Accessibility : Keyboard Navigation

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

null : Section number: 02.03

Subtopic : Electronic Structure

**66)** Where are the alkaline earth metals located on the periodic table?

- A) IA (1)
- B) IIA (2)
- C) IIIA (3)
- D) VIIA (17)
- E) VIIIA (18)

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.04

**67)** How many orbitals are in an  $s$  sublevel? How many in a  $p$  sublevel?

- A)  $s$ : 1,  $p$ : 2
- B)  $s$ : 2,  $p$ : 3
- C)  $s$ : 1,  $p$ : 3
- D)  $s$ : 2,  $p$ : 6
- E)  $s$ : 3,  $p$ : 3

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Difficulty : Medium

Subtopic : Electronic Structure

null : Section number: 02.05

**68)** How many electrons are present in an atom of silicon?

- A) 14
- B) 16
- C) 18
- D) 24
- E) 26

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

null : Section number: 02.01

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

Subtopic : Atomic Number, Mass Number, Atomic Symbol and Isotopes

Difficulty : Medium

Bloom's : Apply

69) What Group IA (1) ion has the electronic arrangement shown  $1s^2 2s^2 p^6$

- A) lithium ion
- B) sodium ion
- C) potassium ion
- D) magnesium ion
- E) calcium ion

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

Difficulty : Medium

null : Section number: 02.06

Subtopic : Valence Electrons

Subtopic : Electron Configuration

Bloom's : Apply

70) What ion carries two negative charges and is isoelectronic with  $K^+$ ?



- A)  $\text{O}^{2-}$
- B)  $\text{S}^{2-}$
- C)  $\text{F}^{2-}$
- D)  $\text{Cl}^{2-}$
- E)  $\text{Ar}^{2-}$

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Subtopic : Atomic Number, Mass Number, Atomic Symbol and Isotopes

null : Section number: 02.06

Subtopic : Valence Electrons

Bloom's : Analyze

Difficulty : Hard

**71)** What kind(s) of particles can be found outside the nucleus of an atom?

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

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

null : Section number: 02.01

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

Subtopic : Electronic Structure

**72)** The total mass of the protons in any neutral atom is about \_\_\_\_\_ times the total mass of electrons in the atom.

- A) 0.0005
- B) 0.3
- C) 1
- D) 2
- E) 2000

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

null : Section number: 02.01

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

**73)** Americium-241 is an isotope used in smoke detectors. What is the composition of a neutral atom of Americium-241?

- A) 241 protons, 95 neutrons, 241 electrons
- B) 241 protons, 95 neutrons, 146 electrons
- C) 95 protons, 146 neutrons, 95 electrons
- D) 95 protons, 146 neutrons, 51 electrons
- E) 95 protons, 241 neutrons, 95 electrons

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

null : Section number: 02.01

Topic : Atoms and the Periodic Table (Components of Matter)

Subtopic : Atomic Number, Mass Number, Atomic Symbol and Isotopes

Difficulty : Medium

Bloom's : Apply

**74)** Which isotope of hydrogen has two neutrons?

- A) hydrogen-1
- B) hydrogen-2
- C) hydrogen-3
- D) deuterium
- E) H- 2

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

null : Section number: 02.01

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

Subtopic : Atomic Number, Mass Number, Atomic Symbol and Isotopes

Difficulty : Medium

**75)** Which of the following accounts for the fact that chlorine has an atomic mass of 35.45 amu rather than a whole number?

- A) isotopes
- B) electrons
- C) protons
- D) radioactivity
- E) isomers

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

null : Section number: 02.01

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

Subtopic : Atomic Number, Mass Number, Atomic Symbol and Isotopes

Difficulty : Medium

**76)** Who discovered that cathode rays consist of a stream of negative particles, electrons?

- A) Crookes
- B) Thomson
- C) Geiger
- D) Rutherford
- E) Bohr

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.02

Subtopic : Atomic Theories

**77)** Who discovered the existence of the atomic nucleus?

- A) Crookes
- B) Thomson
- C) Geiger
- D) Rutherford
- E) Bohr

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.02

Subtopic : Atomic Theories

**78)** In Rutherford's experiment, which led to the discovery of the atomic nucleus, what type of particle or ray was fired at the gold foil target?

- A) alpha
- B) beta
- C) gamma
- D) neutrons
- E) cathode rays

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.02

Subtopic : Atomic Theories

**79)** In Mendeleev's table of the elements, the elements were arranged according to

- A) atomic number.
- B) mass number.
- C) atomic mass.
- D) neutron number.
- E) density.

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.04

**80)** The modern periodic table is arranged according to what property?

- A) atomic number
- B) mass number
- C) atomic mass
- D) neutron number
- E) density

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.04

**81)** What is a horizontal row of elements on the periodic table called?

- A) group
- B) period
- C) family
- D) representative elements
- E) transition elements

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.04

**82)** What are the elements in the A-groups often called?

- A) transition elements
- B) lanthanides
- C) metals
- D) non-metals
- E) representative elements

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.04

**83)** Which of the following elements is a metalloid?

- A) C
- B) Ge
- C) Pb
- D) N
- E) P

**Question Details**

Accessibility : Keyboard Navigation

Difficulty : Easy

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

null : Section number: 02.04

**84)** Where are the halogens located on the periodic table?

- A) representative elements
- B) transition metals
- C) Group VIIA (17)
- D) Group IIA (2)
- E) Group IIIA (3)

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.04

**85)** How many valence electrons are in an atom of carbon?

- A) 8
- B) 6
- C) 4
- D) 1
- E) 0

**Question Details**

Accessibility : Keyboard Navigation

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

null : Section number: 02.06

Subtopic : Valence Electrons

**86)** What is the lowest energy sublevel of a principal level?



- A) *d*
- B) *e*
- C) *f*
- D) *s*
- E) *p*

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Subtopic : Electronic Structure

null : Section number: 02.05

**87)** How many sublevels are there in the third principal energy level?

- A) 3
- B) 2
- C) 1
- D) 0
- E) 4

**Question Details**

Accessibility : Keyboard Navigation

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

Subtopic : Electronic Structure

null : Section number: 02.05

**88)** How many orbitals are there in the second principal energy level?

- A) 2
- B) 3
- C) 1
- D) 0
- E) 4

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

Difficulty : Medium

Subtopic : Electronic Structure

null : Section number: 02.05

**89)** Which of the following correctly gives the electron capacity of a principal energy level in terms of the number  $n$ ?

- A)  $n$
- B)  $2n$
- C)  $2n + 2$
- D)  $n^2$
- E)  $2n^2$

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Difficulty : Medium

Subtopic : Electronic Structure

null : Section number: 02.05

**90)** What is the ground state electron configuration of sulfur, whose atomic number is 16?

- A)  $1s^2 1p^6 2s^2 2p^6$
- B)  $1s^2 2s^2 2p^6 d^6$
- C)  $1s^2 2s^2 2p^6 3s^2 3p^4$
- D)  $1s^2 2s^2 2p^6 3s^2 3d^4$
- E)  $1s^2 2s^2 2p^6 3s^2 d^4$

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Difficulty : Medium

Subtopic : Electronic Structure

Subtopic : Electron Configuration

null : Section number: 02.05

Bloom's : Apply

**91)** Which one of the following electron configurations is appropriate for a ground state atom?

- A)  $1s^1 2s^1$
- B)  $1s^2 2s^1$
- C)  $1s^2 2s^2 2p^8$
- D)  $1s^2 2s^2 2p^4 3s^1$
- E)  $1s^2 2s^2 2p^6 3d^1$

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

Difficulty : Medium

Subtopic : Electronic Structure

Subtopic : Electron Configuration

null : Section number: 02.05

**92)** Which of the following elements is most likely to form a 2+ ion?

- A) Li
- B) K
- C) Al
- D) N
- E) Ca

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

Difficulty : Medium

null : Section number: 02.06

Subtopic : Valence Electrons

**93)** What is the ground state electronic configuration of the sodium ion, Na<sup>+</sup>?

- A)  $1s^2 2s^2 p^5$
- B)  $1s^2 2s^2 p^6$
- C)  $1s^2 2s^2 p^6 3s^1$
- D)  $1s^2 2s^2 p^6 3s^2$
- E)  $1s^2 2s^2 p^6 3s^2 3p^6 4s^1$

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Difficulty : Medium

null : Section number: 02.06

Subtopic : Valence Electrons

Subtopic : Electron Configuration

Bloom's : Apply

**94)** Which of the following ions does not follow the octet rule?

- A) Na<sup>+</sup>
- B) Ca<sup>2+</sup>
- C) Al<sup>3+</sup>
- D) N<sup>3-</sup>
- E) Cl<sup>2-</sup>

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Difficulty : Medium

null : Section number: 02.06

Subtopic : Valence Electrons

Bloom's : Apply

**95)** Which of the following atoms has the biggest size (radius)?

- A) Na
- B) Al
- C) Cl
- D) Rb
- E) I

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

Difficulty : Medium

null : Section number: 02.07

Subtopic : Trends in the Periodic Table

**96)** Which of the following elements has the highest ionization energy?

- A) Li
- B) B
- C) O
- D) F
- E) He

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

Difficulty : Medium

null : Section number: 02.07

Subtopic : Trends in the Periodic Table

**97)** Which of the following elements has the lowest ionization energy?

- A) Li
- B) B
- C) O
- D) F
- E) Ne

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

Difficulty : Medium

null : Section number: 02.07

Subtopic : Trends in the Periodic Table

**98)** Electron affinity is

- A) the energy required to remove an electron from an isolated atom.
- B) the force between two electrons in the same orbital.
- C) the force between two ions of opposite charge.
- D) the energy released when an isolated atom gains an electron.
- E) the attraction of an atom for an electron in a chemical bond.

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.07

Subtopic : Trends in the Periodic Table

**99)** Which one of the following elements has the highest electron affinity?

- A) Li
- B) K
- C) Kr
- D) O
- E) Cl

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

Difficulty : Medium

null : Section number: 02.07

Subtopic : Trends in the Periodic Table

**100)** Which of the following statements relating to Bohr's model of the hydrogen atom is FALSE?

- A) The lowest energy orbit has quantum number  $n = 1$ .
- B) The highest energy orbits are farthest from the nucleus.
- C) In a transition from the  $n = 3$  to the  $n = 1$  level, light is emitted.
- D) Energy differences between energy levels can be calculated from the wavelengths of the light absorbed or emitted.
- E) The Bohr model consists of energy levels that are evenly spaced, like the rungs of a ladder.

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

Difficulty : Medium

null : Section number: 02.03

Subtopic : Structure of the Atom

**101)** What can be said about the possibility of the existence of the hydrogen isotope represented by the symbol shown below?



- A) This isotope of hydrogen is not possible because it has no electrons.
- B) This isotope of hydrogen is not possible because atoms of hydrogen have one proton.
- C) This isotope of hydrogen is possible; it simply contains no protons and is an ion.
- D) This isotope of hydrogen is possible; it simply contains no neutrons.
- E) This isotope of hydrogen is possible; it simply has two neutrons.

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

null : Section number: 02.01

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

Subtopic : Atomic Number, Mass Number, Atomic Symbol and Isotopes

Difficulty : Medium

Bloom's : Evaluate



**102)** For the imaginary element abdicinium (Ab), two isotopes exist. Isotope one has a mass of 40.005 amu with a relative abundance of 14.00%. Isotope two has a mass of 41.008 amu with a relative abundance of 86.00%. What is the atomic mass of the element?

- A) 40.99 amu
- B) 40.87 amu
- C) 40.61 amu
- D) 40.21 amu
- E) 40.05 amu

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

null : Section number: 02.01

Topic : Atoms and the Periodic Table (Components of Matter)

Subtopic : Atomic Number, Mass Number, Atomic Symbol and Isotopes

Difficulty : Hard

Bloom's : Apply

**103)** Which of the following correctly matches the ion with the total number of electrons in the ion?

- A)  $\text{Br}^-$ , 34 electrons
- B)  $\text{Mg}^{2+}$ , 14 electrons
- C)  $\text{Zn}^{2+}$ , 28 electrons
- D)  $\text{P}^{3-}$ , 15 electrons
- E)  $\text{H}^+$ , 2 electrons

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

Difficulty : Medium

null : Section number: 02.06

Subtopic : Valence Electrons

Bloom's : Apply

**104)** Rutherford's experiment, in which alpha particles were aimed at a thin piece of gold, led to what understanding?

- A) Neutrons existed.
- B) Electrons existed and have a negative charge.
- C) The number of electrons can be determined by the mass number and atomic number.
- D) Electrons can be promoted to higher energy by absorbing energy.
- E) An atom is mostly empty space.

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Difficulty : Medium

null : Section number: 02.02

Subtopic : Atomic Theories

**105)** What property of light is defined by the distance between identical points on adjacent waves?

- A) energy
- B) speed
- C) wavelength
- D) spectrum
- E) amplitude

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.03

Subtopic : Structure of the Atom

**106)** Which statement is TRUE concerning Bohr's model of an atom?

- A) The model involved the study of helium.
- B) The model led to the understanding that the energy of an electron is quantized.
- C) When electrons in an excited state return to the ground state, they absorb light.
- D) Bohr's model explains that electrons have a negative charge.
- E) The model defines the existence of orbitals.

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Difficulty : Medium

null : Section number: 02.03

Subtopic : Structure of the Atom

**107)** Which of the following is a metal in the third period?

- A) Ge
- B) Cl
- C) Ca
- D) Mg
- E) Cu

**Question Details**

Accessibility : Keyboard Navigation

Difficulty : Easy

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

null : Section number: 02.04

**108)** Which of the following is a representative nonmetal?

- A) P
- B) K
- C) Si
- D) Ni
- E) Al

**Question Details**

Accessibility : Keyboard Navigation

Difficulty : Easy

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

null : Section number: 02.04

**109)** How many valence electrons are in Na, O and He, respectively?

- A) 1, 6, 8
- B) 11, 8, 8
- C) 1, 6, 2
- D) 11, 8, 2
- E) 2, 4, 2

**Question Details**

Accessibility : Keyboard Navigation

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.06

Subtopic : Valence Electrons

Bloom's : Apply

**110)** Which sublevel has the lowest energy?

- A) 2s
- B) 3p
- C) 4p
- D) 4s
- E) 2p

**Question Details**

Accessibility : Keyboard Navigation

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

Subtopic : Electronic Structure

null : Section number: 02.05

**111)** What is the ground state (shorthand) electron configuration of Se?

- A) [Kr]
- B) [Ar]4s<sup>2</sup> 4p<sup>4</sup>
- C) [Kr]4s<sup>2</sup> 4p<sup>4</sup>
- D) [Ar]4s<sup>2</sup> 4d<sup>10</sup> 4p<sup>6</sup>
- E) [Ar]4s<sup>2</sup> 3d<sup>10</sup> 4p<sup>4</sup>

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Difficulty : Medium

Subtopic : Electron Configuration

null : Section number: 02.05

Bloom's : Apply

**112)** Which of the following gives the correct charge of the ion according to the octet rule?

- A)  $F^+$
- B)  $Ba^{2-}$
- C)  $s^{2-}$
- D)  $P^{3+}$
- E)  $C^{2+}$

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Subtopic : Elements and the Periodic Table

Topic : Atoms and the Periodic Table (Components of Matter)

Difficulty : Medium

null : Section number: 02.06

Subtopic : Valence Electrons

Bloom's : Apply

**113)** Why do atoms gain and lose electrons to have eight electrons in the valence shell?

- A) Atoms/ions are stable when the  $n=2$  principal level is full.
- B) Atoms/ions are stable when the s and p sublevels of the valence shell are full.
- C) Atoms/ions are stable when the d sublevel of the valence shell is full.
- D) Atoms/ions are stable when the  $n=4$  principal level is full.
- E) Atoms/ions are stable when the s, p, and d sublevels of the 2<sup>nd</sup> level are full.

**Question Details**

Accessibility : Keyboard Navigation

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

Bloom's : Understand

Difficulty : Medium

null : Section number: 02.06

Subtopic : Valence Electrons

**114)** Which of the following atoms and ions will have the largest radius?

- A) S<sup>2-</sup>
- B) S
- C) Cl
- D) F
- E) He

**Question Details**

**115)** What is the energy required to remove an electron from an isolated atom?

- A) electron affinity
- B) electronegativity
- C) ionization energy
- D) kinetic energy
- E) potential energy

**Question Details**

Accessibility : Keyboard Navigation

Bloom's : Remember

Difficulty : Easy

Gradable : automatic

Topic : Atoms and the Periodic Table (Components of Matter)

null : Section number: 02.07

Subtopic : Trends in the Periodic Table

## Answer Key

Test name: Chapter 2 - The Structure of the Atom and the

- 1) TRUE
- 2) TRUE
- 3) FALSE
- 4) TRUE
- 5) TRUE
- 6) TRUE
- 7) FALSE
- 8) TRUE
- 9) TRUE
- 10) TRUE
- 11) FALSE
- 12) TRUE
- 13) TRUE
- 14) TRUE
- 15) TRUE
- 16) TRUE
- 17) TRUE
- 18) FALSE
- 19) TRUE
- 20) FALSE
- 21) FALSE
- 22) B
- 23) D
- 24) C
- 25) C
- 26) A



- 27) B
- 28) C
- 29) A
- 30) B
- 31) B
- 32) A
- 33) D
- 34) C
- 35) E
- 36) A
- 37) E
- 38) D
- 39) A
- 40) D
- 41) C
- 42) A
- 43) B
- 44) B
- 45) B
- 46) C
- 47) B
- 48) E
- 49) D
- 50) C
- 51) A
- 52) C
- 53) D
- 54) C
- 55) B
- 56) A

- 57) A
- 58) A
- 59) C
- 60) D
- 61) C
- 62) A
- 63) B
- 64) B
- 65) D
- 66) B
- 67) C
- 68) A
- 69) B
- 70) B
- 71) C
- 72) E
- 73) C
- 74) C
- 75) A
- 76) B
- 77) D
- 78) A
- 79) C
- 80) A
- 81) B
- 82) E
- 83) B
- 84) C
- 85) C
- 86) D

- 87) A
- 88) E
- 89) E
- 90) C
- 91) B
- 92) E
- 93) B
- 94) E
- 95) D
- 96) E
- 97) A
- 98) D
- 99) E
- 100) E
- 101) B
- 102) B
- 103) C
- 104) E
- 105) C
- 106) B
- 107) D
- 108) A
- 109) C
- 110) A
- 111) E
- 112) C
- 113) B
- 114) A
- 115) C