

## Science Reviewer 2<sup>nd</sup> Quarter

- What is the name of the region around the nucleus of an atom where electrons are most likely to be found?  
A. Orbital      B. Shell      C. Cloud      D. Sphere
- What is the maximum number of electrons that can occupy the second shell of an atom?  
A. 2      B. 4      C. 8      D. 18
- What is the name of the electrons that are involved in chemical bonding?  
A. Core electrons      C. Lone pair electrons  
B. Valence electrons      D. Bonding pair electrons
- What is the name of the diagram that uses dots to represent the valence electrons of an atom or a molecule?  
A. Dot plot      C. Lewis dot structure  
B. Dot matrix      D. Electron dot diagram
- How many valence electrons does carbon have?  
A. 2      B. 4      C. 6      D. 8
- What is the correct Lewis dot structure for nitrogen?  
A. N      B. N:      C.  $\ddot{\text{N}}$       D.  $\cdot\ddot{\text{N}}\cdot$
- What is the correct Lewis dot structure for oxygen?  
A. O      B. O:      C.  $\ddot{\text{O}}$       D.  $\cdot\ddot{\text{O}}\cdot$
- What is the correct Lewis dot structure for fluorine?  
A. F      B. F:      C.  $\ddot{\text{F}}$       D.  $\cdot\ddot{\text{F}}\cdot$
- What is the correct Lewis dot structure for neon?  
A.  $\ddot{\text{Ne}}$       B. Ne:      C.  $\ddot{\text{Ne}}:$       D.  $\cdot\ddot{\text{Ne}}\cdot$
- What is the name of the type of bond that results from the sharing of electrons between two atoms?  
A. Ionic bond      B. Covalent bond      C. Metallic bond      D. Hydrogen bond
- What is the name of the type of bond that results from the transfer of electrons from one atom to another?  
A. Ionic bond      B. Covalent bond      C. Metallic bond      D. Hydrogen bond

12. What is the name of the type of bond that results from the attraction between the positive nuclei and the delocalized electrons of metal atoms?

A. Ionic bond      B. Covalent bond      C. Metallic bond      D. Hydrogen bond

13. What is the name of the type of covalent bond that involves the sharing of one pair of electrons between two atoms?

A. Single bond      B. Double bond      C. Triple bond      D. Quadruple bond

14. What is the name of the type of covalent bond that involves the sharing of two pairs of electrons between two atoms?

A. Single bond      B. Double bond      C. Triple bond      D. Quadruple bond

15. What is the name of the type of covalent bond that involves the sharing of three pairs of electrons between two atoms?

A. Single bond      B. Double bond      C. Triple bond      D. Quadruple bond

16. What is the name of the measure of the ability of an atom to attract electrons in a covalent bond?

A. Electron affinity      B. Ionization energy      C. Electronegativity      D. Electron density

17. What is the name of the type of covalent bond that has an equal distribution of electrons and charge between the bonded atoms?

A. Polar covalent bond      B. Nonpolar covalent bond      C. Coordinate covalent bond      D. Dative covalent bond

18. What is the name of the type of covalent bond that has an unequal distribution of electrons and charge between the bonded atoms?

A. Polar covalent bond      B. Nonpolar covalent bond      C. Coordinate covalent bond      D. Dative covalent bond

19. What is the name of the type of covalent bond that has a partial positive charge on one atom and a partial negative charge on another atom?

A. Dipole-dipole bond      B. Dipole-induced dipole bond      C. Induced dipole-induced dipole bond      D. London dispersion bond

20. What is the name of the quantity that represents the difference between the number of valence electrons in an isolated atom and the number of electrons assigned to that atom in a Lewis structure?

A. Oxidation number      B. Formal charge      C. Valence shell      D. Bond order

21. What is the formula for calculating the formal charge of an atom in a Lewis structure?

- A.  $\text{Valence } e^- - (\text{bonding } e^- + \text{lone pair } e^-)$
- B.  $\text{Valence } e^- - \left(\frac{1}{2} \text{bonding } e^- + \text{lone pair } e^-\right)$
- C.  $\text{Valence } e^- - \left(\frac{1}{2} \text{bonding } e^- - \text{lone pair } e^-\right)$
- D.  $\text{Valence } e^- - (\text{bonding } e^- - \text{lone pair } e^-)$

22. What is the name of the principle that states that the most stable Lewis structure is the one similar to the noble gases (having eight valence electrons)?

- A. Octet rule
- B. Resonance principle
- C. Formal charge principle
- D. Lewis structure principle

23. What is the name of the type of molecule that has a symmetrical distribution of charge and no net dipole moment?

- A. Polar molecule
- B. Nonpolar molecule
- C. Ionic molecule
- D. Covalent molecule

24. What is the name of the type of molecule that has an asymmetrical distribution of charge and a net dipole moment?

- A. Polar molecule
- B. Nonpolar molecule
- C. Ionic molecule
- D. Covalent molecule

25. What is the correct electronic configuration for chlorine (Cl)?

- A.  $1s^2 2s^2 2p^6 3s^2 3p^5$
- B.  $1s^2 2s^2 2p^6 3s^1 3p^6$
- C.  $1s^2 2s^2 2p^5 3s^2 3p^6$
- D.  $1s^2 2s^2 2p^4 3s^2 3p^7$

26. What is the correct electronic configuration for iron (Fe)?

- A.  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^6$
- B.  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1 3d^7$
- C.  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^4$
- D.  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^5$

27. What is the correct electronic configuration for neon (Ne)?

- A.  $1s^2 2s^2 2p^6$
- B.  $1s^2 2s^2 2p^4$
- C.  $1s^2 2s^1 2p^5$
- D.  $1s^2 2s^2 2p^2$

28. Valence electrons are the \_\_\_\_.

- A. number of electrons lost.
- B. number of electrons gained.
- C. electrons in the innermost energy level of an atom.
- D. electrons in the outermost energy level of an atom.

29. Structures of atoms and molecules whose valence electrons are represented by dots are known as \_\_\_\_ structures.

- A. Arrhenius
- B. Bronsted
- C. Lewis
- D. Lowry

30. Which pair of elements can combine to form ionic bonds?

- A. Na and Cl
- B. H and N
- C. C and O
- D. Xe and F

31. Which element resists bond formation with other elements?

A. Argon      B. Bromine      C. Gold      D. Silver

32. Many organic solvent boil below 200°C because of covalent bonding. Solids, such as copper, do not melt until thousands of degrees Celsius because the atoms form \_\_\_\_\_.  
A. Hydrogen bond      B. Metallic bonds      C. Nonpolar bonds      D. Polar bonds

33. The ions  $\text{Li}^+$ ,  $\text{Be}^{2+}$ , and  $\text{H}^-$  do not follow the octet rule. Why?  
A. They belong to Group IA.  
B. They are stable with 3 or 4 electrons.  
C. They are stable with 2 electrons only.  
D. They do not have 8 electrons in their outermost shells.

34. A strontium atom differs from a strontium ion in a way that the atom has a greater \_\_\_\_\_.  
A. atomic number      C. number of electrons  
B. mass number      D. number of protons

35. Which of the following is an ionic compound?  
A.  $\text{KF}$       B.  $\text{CS}_2$       C.  $\text{CO}_2$       D.  $\text{CCl}_4$

36. Which of the following is not a characteristic of metals?  
A. malleable and ductile      C. good conductors of electricity  
B. good conductors of heat      D. low melting and boiling points

37. The energy required to remove an electron from an atom is known as \_\_\_\_\_.  
A. electron affinity      B. electronegativity      C. ionization energy      D. kinetic energy

38. A positive ion is known as \_\_\_\_\_.  
A. an anion      B. a cation      C. an electron      D. a proton

39. Which of the following is incorrect?  
A. All elements in the second period of the periodic table contain two valence electrons.  
B. Electron configuration may be used to determine the number of valence electrons of an element.  
C. In the periodic table, the number of valence electrons determines the group placement of an element.  
D. In the periodic table, the number of the representative elements is equal to the total number of electrons in the outermost shell.

40. What will happen if argon (Ar) and barium (Ba) are made to react?  
A. Ar will lose electrons.      C. Ba and Ar will share electrons.  
B. Ba will gain electrons.      D. Ba and Ar will not form a compound.