

Chapter 1:

1. What determines the degree of reactivity of an organic molecule?
- The length of the molecule's main chain.
  - The molecular weight of the molecules.
  - Functional groups on the molecule.
  - Whether or not the molecule is an alkane.

Answer: C

2. What defines a covalent bond?
- The swapping of electrons between two atoms.
  - The loss of an electron from one atom and its gain by another.
  - Shared electrons between two atoms.
  - Shared outer electrons between two atoms.

Answer: D

3. In what type of bond are the electrons forming the bond not shared equally?
- A covalent bond.
  - A polar covalent bond.
  - An ionic bond.
  - A non-polar covalent bond.

Answer: B

4. How are the nucleus and inner electrons of an atom represented in a Lewis structure?
- By the atomic symbol.
  - By a series of dots.
  - By a series of small "x" marks.
  - By a bracketed atomic symbol.

Answer: A

5. What do multiple resonance forms of a molecule represent?
- One structure in several different positions in three-dimensional space.
  - Localized electrons in several structures.
  - A high speed interchange of valence electrons among the various structures.
  - A composite or hybrid of each of the structures.

Answer: D

6. That lower energy orbitals fill preferentially to higher energy ones is an expression of what principle?

- a. The Pauli exclusion principle.
- b. The aufbau principle.
- c. The wave equation principle.
- d. The de Broglie wavelength principle.

Answer: B

7. In what two orientations can p atomic orbitals overlap?

- a. Side to side, end to end, or side to end, forming pi and sigma bonds respectively.
- b. Either side to side, or end to end, forming sigma and pi bonds respectively.
- c. Either side to side, or end to end, forming pi and sigma bonds respectively.
- d. Side to side, forming pi bonds in the molecule.

Answer: C

8. Why do carbon atoms when covalently bonded in molecules adopt a tetrahedral shape?

- a. They hybridize with surrounding carbon or hydrogen atoms in forming their bonds.
- b. They are sp, sp<sup>2</sup>, or sp<sup>3</sup> hybridized.
- c. They are never sp<sup>3</sup> hybridized.
- d. They are sp<sup>3</sup> hybridized.

Answer: D

9. What type of bonding is present in the double bond drawn in a Lewis structure?

- a. Sigma bonding.
- b. Pi bonding.
- c. Sigma and pi bonding.
- d. Pi - pi bonding.

Answer: C

10. What are represented in constitutional isomers?

- a. Two or more chemicals that have the same molecular formula.
- b. Two or more substances that have the same physical properties.
- c. Two or more materials that have the same chemical properties.
- d. Two or more chemicals that have the same molecular shape and size.

Answer: A