1. A bond defines the ________________.
   a) shape of a molecule  
   b) dynamic properties of a molecule  
   c) electronic structure of a molecule  
   d) all of the above

2. The electronic structure of a molecule determines the ________________.
   a) its physical properties  
   b) its chemical properties  
   c) its biological properties  
   d) all of the above

3. A covalent bond differs from an ionic bond in its ________________.
   a) distribution of neutrons  
   b) distribution of electrons  
   c) distribution of protons  
   d) none of the above

4. The following is a ________________ orbital.
   ![Orbital Diagram]
   a) s  
   b) p_x  
   c) p_y  
   d) p_z

5. Ionic bonds of the type ________________ are found in biological systems.
   a) RNH_3^+ − Cl  
   b) R^− − O=C−R'  
   c) R−H−−−O=C−R'  
   d) none of the above

6. Hybridization is the process of ________________.
   a) transfer of energy to higher orbitals and mixing to form equivalent orbitals  
   b) transfer of electrons to higher orbitals and mixing to form equivalent orbitals
c) transfer of protons to higher orbitals and mixing to form equivalent orbitals
d) none of the above

7. The hybridization state of the central carbon in \( \text{H}_3\text{CCH}_2\text{CH}_3 \) is ___________________.
   a) sp
   b) sp2
   c) sp3
   d) none of the above

8. The bond angle increases in the sequence _________________.
   a) sp < sp2 < sp3
   b) sp2 < sp < sp3
   c) sp3 < sp < sp2
   d) sp3 < sp2 < sp

9. A sigma – bond is different from a pi – bond in the sense that a pi bond is always formed between two ________________ orbitals.
   a) sp
   b) sp2
   c) p
   d) s

10. The electronic structure of the oxygen atom in the \( \text{R}_2\text{C}=\text{O} \) is _________________.
    a) \( 1s^2,2s^2,2px^1,2py^2,2pz^1 \)
    b) \( 1s^2,2s^2,2px^2,2py^1,2pz^1 \)
    c) all of the above
    d) none of the above

11. Find the hybridization states of the marked (*) atoms in the following structure: