**Problem set 3**

1. The amino acid that can form a disulfide linkage is

a. methionine b. cysteine c. histidine d. proline

2. Peptide bond is

a. covalent b. planar, covalent

c. rigid with partial double bond character d. all of the above

3. Arrange the following in the increasing order of protein structure hierarchy:

A: α-helix

B: amino acid sequence

C: quaternary structure

D: folded structure

a. A, D, C, B b. A, D, B, C

c. B, A, D, C d. B, A, C, D

4. Formation of peptide bond is a

a. ligation reaction b. oxidation reaction

c. hydrolysis reaction d. condensation reaction

5. How are secondary structures stabilized in proteins?

a. Through ionic bonds between oppositely charged amino acid side chains

b. Through covalent bonds joining different parts of the peptide backbone

c. Through hydrogen bonds between different amino acid side chains

d. Through hydrogen bonds joining different parts of the peptide backbone

6. Which of the following CAN NOT be close (adjacent) in primary structure

a. two α-helices c. parallel β-strands

b. anti-parallel β-strands d. an α-helix and a β-strand

7. What is a protein domain? (A) The α-helical or β-pleated sheet portion of a protein (B) A multi-subunit protein complex (C) Part of a protein folded into a self-contained 3D structure (D) An unfolded part of a protein

8. Theoretically, a vast number of different proteins can be assembled from 20 different amino acids. How many polypeptide chains are possible that are 10 amino acids long?

9. Glycine and alanine contain \_\_\_\_\_\_ and\_\_\_\_\_\_\_ chiral center(s) respectively

10. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_interactions are the major driving force for folding of a globular protein.

11. Hydrogen bonds in α-helices are (A) more numerous than Van der Waals interactions (B) not present at Phe residues (C) analogous to the steps in a spiral staircase (D) roughly parallel to the helix axis

12. You have purified a multi-subunit extracellular protein that has several interchain disulfide bonds. Which of the following chemicals would you add to your purified protein mixture if you wanted to eliminate the disulfide bonds? (A) NaCl, a salt (B) SDS, an ionic detergent (C) H2O2, an oxidizing reagent (D) DTT, a reducing agent