There are 10 questions in this test. Each one is worth 10 point

1. Suppose that in a breeding experiment, 7,000 AA individuals and 3,000 aa individuals mate at random,

   a. In the first generation of offspring, what would be the frequencies of the three genotype AA, Aa, and aa?

   b. What would be the frequencies of the two alleles?

   c. What would be the values in the second generation, assuming that the Hardy-Weinberg assumptions hold?

   d. List the 5 assumptions.

2. A medical problem caused by the Rh factor is hemolytic anemia of the new born.

   a. Explain the mechanism that Rh factor causes hemolytic anemia of the new born of the second pregnancy.

   b. How this problem can be corrected at present.

3. Explain the following terms in relation to kidney functions:

   filtration, secretion, reabsorption, and excretion.

4. Describe the principal roles played by each of the following hormones:

   auxin, cytokinin, ethylene, abscisic acid, and gibberellin

5. Write down a representative structural formula for the followings:

   monosaccharide, polysaccharide, fatty acid, amino acid, and peptide

6. What are the functions of the cytoskeleton?
   Describe the similarities and differences between microtubules, actin filaments, and intermediate filament.

7. Describe the activities occurring during each phase of the cell cycle and the role of each phase in the overall process of cell division.

8. In enzyme regulation by allosteric interaction, the inhibitor often works on the first enzyme of the series. In regulation by competitive inhibition, it often works on the last. Why this difference?

9. Explain "chemiosmotic coupling" in oxidation phosphorylation.

10. A culture of bacterial cells is grown in a medium containing glucose and lactose with a fixed amounts as the sole carbon source. Describe the series of events that take place in the operon as the sugars are metabolized.