Practice for AP Bio Exam:

Question 1:

1. Cells can be stimulated to divide by proteins which bind to receptors on their cell membranes. Describe the role of the protein and receptor in the cellular response of the cell to divide.
2. Mutations that lead to an increase in the proteins that can stimulate cells to divide can result in cancer. Describe 2 mutations OUTSIDE of the coding region for the gene could lead to overproduction of the protein in that cell. (in other words, think about what else influences transcription in a cell)
3. Antibodies can be used in treatment against cancer, as they interact with the receptors on the outside of the cells. Propose a model to explain how the antibody therapy interferes with the cell signaling pathway and state one reason why the therapy would be effective for treating cancer.

Question 2:

1. What are three ways in which bacteria can acquire new genes?
2. What are the two main features of natural selection that lead to a trait like antibiotic resistance?

Question 3:

1. What is the pathway of a protein in a cell? (from start to finish)
2. What is a polypeptide?
3. What is the role of mRNA in protein synthesis and where might you find it in a cell? Would it work to use mRNA to trace the path of a protein in a cell? Why or why not?

Question 4

1. How would you describe the primary structure of an enzyme?
2. How does the primary structure determine the function of an enzyme?
3. How does a non-competitive inhibitor work? What does it do the shape of an enzyme?

Question 5

1. How does the structure of the cell membrane regulate the permeability to Na+ and K+ ions?
2. What is an action potential? How does the charge of the cell help to propagate it?
3. In terms of neuron structure, how is the signal passed from one neuron to the next?
4. Describe 2 functions of neurotransmitters.

Question 6

1. What are the INORGANIC molecules necessary for photosynthesis?
2. What is the ORGANIC molecule made in the process, which incorporate the inorganic molecule(s)?

Question 7

1. What does it mean for a population to be in Hardy-Weinberg equilibrium? Are allele frequencies changing?
2. What are the 2 formulas used to calculate Hardy-Weinberg? What do each of the letter designations mean?
3. Which equation do you use if you are trying to calculate the % of individuals in the population who are heterozygous?

 Question 8

1. What is a point mutation? How can single nucleotide polymorphisms (changes in single nucleotides) be predictors of disease if a person has her genome sequenced?
2. What is a frameshift mutation?

Question 9

1. What role do microorganisms play in nutrient cycling in the environment?
2. What get cycled in an ecosystem?