*Biochemistry Study Questions:*

1. What are the approximate ratios of proteins, carbohydrates, and fats that should be present in a healthy balanced diet?
2. Explain the difference between a complete and an incomplete protein?
3. Explain the difference between monosaccharides, dissacharides, and polysaccharides.
4. Explain the difference between an a  and a b glucose?)
5. Write a structural formula  for sucrose,  Show how it is formed from fructose and glucose
6. What is the link called that is formed between two monosaccharides to form a disaccharide?
7. What kind of reaction must occur to form this link?
8. . Explain the characteristic(s) that distinguish amylose, amylopectin and cellulose
9. Why can humans not digest cellulose?
10. What is the difference between an aldose and a ketose sugar?
11. What are two separate tests that can be used to distinguish aldoses from ketoses?
12. What is the difference between a furanose and a pyranose?
13. What are the important functions of carbohydrates?
14. Describe using a diagram the link that occurs between two amino acids in the formation of a protein.  What is this linkage called?
15. What is a zwitterions?
16. How does the form of zwitterions change with pH?
17. Explain the meaning and distinguishing characteristics for the primary, secondary, tertiary, and quaternary structure of proteins.
18. Explain the function of the Biruet and the Ninhydrin tests for proteins.  What is the difference in the kinds of things the detect?
19. Explain the isolation of proteins using paper chromatography
20. What is electrophoresis? How can it be used to isolate proteins?
21. List three functions of proteins in the body
22. What are lipids?
23. Explain the structural difference between saturated and unsaturated fats?
24. How does this structural difference affect the melting point?  .
25. A lipid is made up from 2 different molecules.  What are they?
26. What is the difference between a fatty acid  and a triglyceride?
27. What sources are most likely to yield saturated and unsaturated hydrocarbons respectively? .
28. List three important functions of lipids in the body.
29. Explain   the iodine index .  How can it be used to assess the degree of unsaturation in a fat or oil?
30. What is a vitamin?
31. How can one distinguish between a fat soluble and a water soluble vitamin
32. For each of the following vitamins:  Vitamin A, Vitamin C, and Vitamin D; state whether it is water soluble or fat soluble, describe its function in the body, and state the disease or condition that results from a deficiency of this vitamin
33. What is the distinguishing characteristic of a steroid
34. What are hormones?
35. Explain source and the function of each of the following hormones in the body:  Estradiol, Progesterone, testosterone, adrenalin, and thyroxine.
36. Describe the structure of DNA
37. What is the kind of attraction that holds the two strands of the DNA together
38. How is genetic information stored in DNA
39. What are the differences between  DNA and RNA?
40. What are two functions of RNA
41. How does RNA code for proteins
42. What is an enzyme?  What is a substrate?
43. What happens to the rate of an enzyme catalyzed reaction as the concentration of substrate increases
44. What is Vmax and the Michaelis Menton Constant
45. How do temperature and pH affect the rate of  an enzyme catalyzed raction?
46. Explain the role of ATP and ADP in respiration
47. Explain the differences between aerobic and anaerobic respiration and give examples.
48. Explain the role of hemoglobin in the transport of  oxygen and carbon dioxide to and from the cell
49. Describe the structure of cytochromes.
50. Explain the mechanism for oxidation and reduction  that is catalyzed by cytochromes in the cell