Biochemistry Review Questions

1.Describe the relationship between an element and an atom.
2.List the four most common elements found in living organisms.
3.Name 8 trace elements with their chemical symbols that are found in living things.
4.Describe the relationship between a molecule and a compound.
5.How do covalent bonds differ from ionic bonds?
6.Which bond is stronger-ionic or covalent? Explain your answer.
7.How does a molecular formula differ from a structural formula?
8.How do organic compounds differ from inorganic compounds? Give two examples of each.
9.Why is water considered to be the most important inorganic compound found in living organisms.(Give four reasons).
10.What type of information does the pH scale provide? Explain how it works.
11.Relate carbon's unique bonding ability with the complexity in structure of organic compounds.

Carbohydrates

12.Identify the building blocks of carbohydrates
13.List the elements found in carbohydrates.
14.What is the molecular formula for all monosaccharides? Give two examples of a simple sugar.
15.What is the ratio of hydrogen to oxygen atoms in all carbohydrates?
16.What is a disaccharide? Give two examples.
17.Describe the process of dehydration synthesis.
18.Why is water considered a metabolic waste of dehydration synthesis?
19.Describe the process of hydrolysis.
20.How is a disaccharide like maltose formed?
21.How is a maltose molecule broken down into its building blocks?
22.Describe the structure of a polysaccharide.
23.Why is a polysaccharide considered an example of a polymer?
24.Describe the biological uses for carbohydrates(at least 3 uses).
25.Cellulose, chitin, and glycogen are examples of polysaccharides. Describe their functions in living organisms.

Lipids

26.What three elements make up lipids?
27.Give three examples of lipids.
28.What is the ratio of hydrogen to oxygen atoms in a lipid?
29.Describe the biological functions of lipids in living organisms (list at least 3 uses).
30.What are the building blocks of lipids?

31.By what process are lipids made from 3 fatty acids and glycerol?
32.By what process are lipids broken down into 3 fatty acids and glycerol?

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32a. Identify the group found at the end of the fatty acids.

Proteins

33.What 4 elements are found in proteins?
34.Name a 5th element that is sometimes found in proteins.
35.Discuss the four major biological uses of proteins.
36.What is the basic building block of proteins?
37.How many amino acids are used by living organisms? How do they structurally differ?
38.How does a dipeptide differ from a polypeptide?
39.By what process are dipeptides and polypeptides synthesized ?
40.Why is a polypeptide considered a polymer?
41.By what process are polypeptides broken down?
42.Describe the structure of a protein.
43.Relate the structure of proteins to the uniqueness and variety among and between organisms of any given species.
44.what are essential amino acids?
45. Why must you take in all 8 essential amino acids at the same time?
46.What happens if all amino acids are not present when the body needs to synthesize the proteins?
47.Describe the process of deamination.
48.What is the difference between a complete protein food and an incomplete protein food? Give an example of each .

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49.Draw the structure of an amino acid. Circle the carboxyl group, the amino group and the variable R group.

Enzymes

50. What is the function of an enzyme?
51.Why is an enzyme called an organic catalyst?
52.Is an enzyme specific in its catalytic activity? Explain your answer.
53. What is a co-enzyme?
54.Describe the importance of the active site of an enzyme.
55.What is a substrate?
56.Illustrate the lock and key theory of enzyme action. Explain your drawing.
57. What happens to the enzyme once a biochemical reaction complete?

58. Describe what happens to an enzyme once it's heated? Illustrate your answer with a graph showing what happens to the enzyme.
59.How does pH affect an enzyme? Draw a graph to illustrate your answer that is properly labeled.
60.How does substrate concentration affect enzyme action if the concentration of enzymes is fixed. Illustrate your answer with a graph that is properly labeled.
61.If substrate concentration is fixed, how will this affect enzyme action? Draw a graph as your answer (Properly labeled).

Nucleic Acids

62.What is the full name of DNA? Where do you find DNA in the cell?
63. What is the basic building block of DNA? Illustrate your answer and label all parts.
64. DNA and RNA differ in three ways. List these differences.
65.How many nucleotides are there for DNA? How do they differ?
66.Name four nitrogenous bases in DNA. How do the DNA nitrogenous bases pair up?
67.What is the shape of a DNA molecule in nature?
68.When DNA is untwisted, it resembles a ladder. What makes up the sides of the ladder? What makes up the steps?
69.What is the function of DNA?
70.List in INCREASING order of size: Nucleus, DNA, Chromosome and Gene.
71.If all cells of a living thing have the same exact DNA, how can there be a variety of cells with different functions making up an individual organism.
72.What is the full name of RNA?
73.How does RNA differ from DNA? List three basic differences.
74.How many types of DNA are there? Indicate them by their names.
75.What is the general function of RNA?