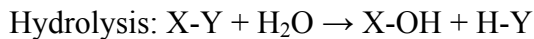
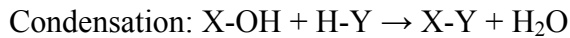


Quiz 2 Key (Ave 73, High 100 (2), Low 23)  
BI-102-1, Fall '06, Dr. C. S. Tritt

Each question graded on 10 point scale, final total divided by 0.7 to put score on 100 point basis. In general, remember it is often helpful to make a drawing when answering questions.

1. Compare and contrast the processes of condensation and hydrolysis.

Condensation and hydrolysis are both biologically important chemical reactions involving water. Condensation refers to the formation of a chemical bond between two molecules with the production of water (sometimes indirectly) as a byproduct. Hydrolysis involves the breaking of a bond by the addition of water to it. These reactions are shown below generically:



Not saying form or break bonds -2. Note that condensation and hydrolysis can be associated with many types of bonds, not just peptide bonds.

2. What is the primary structure of a protein?

It's sequence of amino acids. Not saying sequence -2. Describing the secondary, tertiary or quaternary structures -3.

3. Describe a possible origin of the nuclear membrane and endoplasmic reticulum of modern eukaryotic cells.

The in-folding of the plasma (or cell) membrane of a primitive cell. Describing the endo-symbiotic bacteria that may have become mitochondria and chloroplasts -8.

4. Name and briefly describe any 2 of the 6 currently recognized kingdoms of life.

Any 2 of the following (I accepted pretty weak descriptions for full credit, no descriptions -5):

Bacteria – “modern” prokaryotic (simple) organisms. Not saying simple or prokaryotic -1.

Archae-bacteria – “primitive” prokaryotic organisms that often live in extreme environments and are thought to be the living organisms most similar to early life on Earth.

Protista – Single cells and unspecialized eukaryotic organisms. Some are photosynthetic.

Plants – Multicellular, photosynthetic eukaryotic organisms.

Fungi – Mostly multicellular, usually immobile eukaryotic heterotrophes with chitin cell walls.

Animals - Multicellular, heterotrophic eukaryotes. Usually mobile.

5. What is the major function of ribosomes?

Protein synthesis based on mRNA “instructions.” Just saying something about RNA information was worth a point or 2. Saying the aid or contribute to protein synthesis was -1.

6. Compare and contrast the processes of diffusion and permeation and described by Dr. Tritt in lecture.

Both diffusion and permeation refer to the transport of a material via molecular motion. Diffusion occurs in a single phase. Permeation involves transport through an intervening phase by molecular motion. I did not require the phrase molecular motion be used, but it is an important aspect of the concepts. Describing trans-membrane transport processes -7.

7. Explain what an electrochemical gradient is and how it differs from a concentration gradient.

The electrochemical gradient is the combination of electrical forces and concentration differences that dictate the natural direction of diffusion and permeation. It differs from concentration gradient in that it accounts for electric charge (and field) effects. I was very generous when I graded this one (because it’s difficult to explain). Full credit was given just for describing the membrane potential (charge) of living cells. The most I deducted for this one was -5.