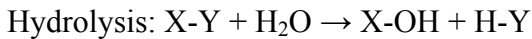
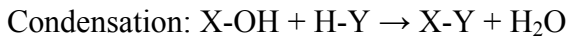


Quiz 2 Key (Ave 82, High 100(2), Low 43)
BI-102-2, Fall '06, Dr. C. S. Tritt

Each question graded on 10 point scale, final total divided by 0.7 to put score on 100 point basis.

1. Compare and contrast the processes 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 (1 pt each). Note that condensation and hydrolysis can be associated with many types of bonds, not just peptide bonds.

2. Name a common carbohydrate.

Any of the following: glucose, fructose, galactose, ribose, deoxyribose, sucrose, lactose, maltose, starch, glycogen and cellulose. Full credit given for $\text{C}_6\text{H}_{12}\text{O}_6$. Saying "sugar" or $n(\text{CH}_2\text{O})$ was -4 (too general).

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

The in-folding of the plasma (or cell or outer) membrane of a primitive cell. Describing the endo-symbiotic bacteria that may have become mitochondria and chloroplasts -8. Just saying a membrane forms and folds in was -2. Saying the cell wall folded in was -3.

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. Archae-bacteria have cell walls composed of different materials than those of “ordinary” bacteria. Saying they don’t have cell walls was -1.

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.” Saying the aid or contribute to protein synthesis is weak but was given full credit. Just saying something about RNA information was worth a point or 2.

6. Name and describe any 3 of the 6 types of membrane proteins discussed in class.

Any three of the following (with descriptions):

Transporters – Selectively permit materials to enter and leave cells.

Enzyme – Catalyze reactions on interior (and exterior) of cells.

Surface receptors – Detect and response to signal molecules at the external surface of cells.

Cell Identity Markers – Allow cells to be identified (by other cells and immune system proteins).

Cell Adhesion Proteins – Attach cells to each other (and to the ECM).

Cytoskeleton Attachments – Attach the cytoskeleton to the cell membrane (allowing the cell to change shape and sense mechanical deformation).

Information in parentheses above is not in the book and therefore not required.

7. 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. **Permeation is not restricted to movement through a lipid bilayer membrane.**