

Characteristics of Life and Biochemistry

1. Define:

Assimilation – Assimilation is the process allowing living organisms to take in materials from their environment and reorganize them for use within cells. Assimilation involves catabolism (the breakdown of materials), and anabolism (the synthesis of new materials).

Protoplasm - Protoplasm is living substance, or the material all living cells are made of. It is the physical and chemical basis for life and changes in composition over time. It is alive and dynamic.

Electrolyte – Electrolytes are substances that can dissociate in water (or other suitable solvents), forming ions. For example, table salt (NaCl) will form Na^+ and Cl^- ions. When electrodes are placed in an electrolyte solution, and voltage is applied, the solution is able to conduct electricity.

Polysaccharide - A polysaccharide is a long chain carbohydrate made up of many (ten or more) simple sugars (monosaccharides) that have been joined together via condensation reactions. Polysaccharides are generally not water soluble and not sweet to the taste. They are used as food storage and/or structural components.

Triglyceride - Triglycerides are lipids that are made up of three fatty acid chains attached to a glycerol "backbone". Various types of fatty acids can be involved, and the type present will influence the consistency of the triglyceride.

2. Several answers are possible here, the characteristics common to all living organisms include the ability to reproduce (sexually and asexually), grow by means of assimilation, carry out metabolic processes (catabolism and anabolism), show response to environmental stimuli (irritability and adaptation), mutate, and maintain a high degree of organization.
3. Assimilation/ mutate
4. Mutation/ response to environmental stimuli
5. Protoplasm
6. C, H, O, P, K, I, N, S, Ca, Fe, Mg, Na and Cl
7. Cations/ anions
8. Water
9. Hydrolysis/ condensation or dehydration synthesis - (hydro=water, lysis=to split) is the cleavage or splitting of an organic compound by the addition of water. The water is also split, with the hydroxyl (OH) group binding to one portion of the organic compound, and the hydrogen (H) binding to the other. In condensation or dehydration synthesis reactions, water is removed from organic compounds (the OH from one and the H from another) and the two organic compounds join together.

10. Carbohydrates/ hexose monosaccharides/ polysaccharides
11. Pentose monosaccharides
12. Disaccharides/ polysaccharides
13. Amino acids/ quaternary
14. Water/ peptide
15. Triglycerides
16. Saturated/ carbon-carbon double bonds (or sometimes triple bonds)
17. Phospholipids/ amphipathic or amphiphilic (two ways suffering or two ways loving)
18. Cholesterol
19. Nucleic acids/ Nucleotides that are used to form nucleic acids (DNA and RNA) serve as the genetic information of cells and viruses. Other functions of nucleotides include: 1) they may be used to form high energy compounds (ATP, GTP, etc.); 2) they may be used to make coenzymes (enzyme helpers) such as NAD, FAD, and NADP; 3) they may be used as regulatory molecules such as cyclic-AMP or cyclic-GMP.
20. Nucleotides/ coenzymes/ ATP, GTP, etc.
21. E, L, G, K, I, A, C, J, D and F