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Frequently Asked Questions(FAQs) Q.1. What are the fundamental properties of life?

Ans: The fundamental properties of life are as its cellular composition with an organised assemblage of molecules enclosed within membranes. These cells are quite similar in size, sensitivity, growth and development, reproduction and regulation and homeostasis.

Q.2. What is one of the most fruitful approaches to understanding biological phenomena?

Ans: One of the most fruitful approaches to understanding biological phenomenon has been to purify an individual chemical component, such as a protein, from a living organism and to characterize its structural and chemical characters.

Q.3. What was the conclusion of Scientists by the end of 18th century towards the composition of living matter?

Ans: By the late 18th century, chemists had concluded that the composition of living matter is strikingly different from that of the inanimate world and it was thought that only living beings could produce the molecules of life.

Q.4. Who published a paper on the synthesis of urea? What was its significance?

Ans: Friedrich Wohler in 1828 published a paper on the synthesis of urea proving that organic compounds can be created artificially.

Q.5. Which biochemical investigations revealed remarkable chemical similarities in plant and animal cell and when?

Ans: During the first half of the 20th century, parallel biochemical investigations of glucose breakdown in yeast and in animal muscle cells revealed remarkable chemical similarities in these apparently very different cell types

Q.6.How many chemical intermediates are involved in the breakdown of glucose in yeast and muscle cells?

Ans: The breakdown of glucose in yeast and muscle cells involved the ten chemical intermediate.

Q.7. Name the element around which the chemistry of living organisms is organized. How much it accounts for dry weight of cells?

Ans.The chemistry of living organisms is organized around carbon, which accounts for more than half the dry weight of cells.

Q.8. "Bonding versatility of carbon was a major factor in the selection of carbon compounds for the molecular machinery of cells during the origin and evolution of living organisms". Explain the statement

Ans Carbon can form single bonds with hydrogen atoms, and both single and double bonds with oxygen and nitrogen atoms. Of greatest significance in biology is the stability of carbon atoms to form very stable carbon-carbon single bonds. Each carbon atom can form single bonds with up to four other carbon atoms. Two carbon atoms also share two or three electron pairs, thus forming double or triple bonds.Covalently linked carbon atoms in biomolecules can form linear chain, branched chains, and cyclic structures. To these carbon skeletons are added groups of other atoms, called functional groups, which confer specific chemical properties on the molecule. No other chemical element can form molecules of such widely different sizes and shapes or with such a variety of functional groups.

Q.9. Why are most biomolecules regarded as derivatives of hydrocarbons?

Ans: Most biomolecules are regarded as derivatives of hydrocarbons

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as hydrogen atoms of hydrocarbons replaced by a variety of functional groups to yield different families of organic compounds. Typical of these are alcohols, which have one or more hydroxyl groups; amines, with amino groups; aldehydes and ketones, with carbonyl groups; and carboxylic acids, with carboxyl groups.

Q.10. What are polyfunctional biomolecules?

Ans:Polyfunctional biomolecules contain two or more different kinds of functional groups, each with its own chemical characteristics and reactions.

Q.11. What are secondary metabolites?

Ans: Vascular plants, in addition to the universal set, small molecules called secondary metabolites, which play a specific role in plant life. These metabolites include compounds that give plants their characteristic scents, and compounds such as morphine, quinine, nicotine and caffeine.

Q.12. Define the term "cell's metabolome"

Ans: The entire collection of small molecules in a given cell has been called that cell's metabolome, in parallel with the term "genome". If we know the composition of a cell's metabolome, we could predict which enzymes and metabolic pathways were active in that cell.

Q.13. Write a short note on macromolecules.

Ans: Many biological molecules are macromolecules, polymers of high molecular weight assembled from relatively simple precursors. Carbohydrates (polysaccharides), Proteins, lipids and nucleic acids carbohydrates are produced by the polymerisation of relatively small compounds with molecular weights of 500 or less. The number of polymerised units can range from tens to millions.

Q.14. What was the earlier type of atmosphere according to Aleksadr I. Oparin?

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Ans According to the biochemist Aleksadr I. Oparin (1992) the early atmosphere was very different from that of today. Rich in methane, ammonia and water, and essentially devoid of oxygen. It was a reducing atmosphere, in contrast to the oxidizing environment of our era.

Q. 15. Write a few lines on the importance of the adenine

Ans: Adenine is not only a constituent of information molecules like DNA and RNA but is also present in energy rich compounds such as FAD (Flavine adenine dinucleotide), NAD⁺ and NADP⁺ (nicotinamide adeine dinucleotide), cAMP (Cyclic adenosine 3,5 monophosphate), and others.