Frequently Asked Questions (FAQ's)

Q1. What are lipids?

Ans: The lipids are the organic compounds which are insoluble in the water but soluble in the non-polar organic solvents such as acetone, benzene, chloroform and ether. The cause of this general property of lipids is the predominance of long chains of aliphatic hydrocarbons or benzene ring in their molecules. They are non-polar and hydrophobic.

Q2. What are the common examples of lipids?

Ans: The common examples of lipids include butter, ghee, cooking oil, natural rubber, cholesterol, carotene, lycopene, eucalyptus oil, menthol, vitamins A, E and K.

Q3. What are essential fatty acids?

Ans: Some animals, especially mammals, are unable to synthesize certain fatty acids and, therefore, require them in their diet. They are called essential fatty acids and include linoleic acid, linolenic acid and arachidonic acid. Such essential fatty acids have to be obtained by the animal from plant material.

Q4: What are the differences between saturated and unsaturated fatty acids?

Ans: The differences between saturated and unsaturated fatty acids are as under:

Saturated fatty acids	Unsaturated fatty acids
Carbon atoms are linked by single bonds and bear hydrogen atoms.	Carbon atoms are linked by double bonds at one or more places and lack hydrogen atoms.
Higher melting point.	Lower melting point.
They are in straight chains.	They bear a kink or bend at the double bond.

They are solid at ordinary temperature.	They are liquid at ordinary temperature.
Mostly found as animal fat.	Abundant in plants.

Q5. Why triglycerides of animal are solid and those of plantsare liquid at room temperatures?

Ans: The triglycerides of animal fats tend to have many long-chain saturated fatty acids, packed tightly together; these fats are usually solids at room temperature and have a high melting point. The triglycerides of plants, such as corn oil, tend to have short or unsaturated fatty acids. Because of their kinks, these fatty acids pack together poorly and have a low melting point, and these triglycerides are usually liquids at room temperature.

Q6. What are the various types of lipids?

Ans: The various types of lipids are simple lipids (neutral fats and waxes), complex lipids (phospholipids, glycolipids and lipoproteins) and derived lipids (steroids).

Q7. What are polyunsaturated fatty acids?

Ans: The fatty acids which have more than one double bond are called polyunsaturated. The polyunsaturated fatty acids have multiple kinks. These kinks prevent the molecules from packing together tightly. The kinks in fatty acid molecules are important in determining the fluidity and melting point of a lipid.

Q8. What are waxes and how they are important for living organisms?

Ans: Waxes are esters of long-chain saturated and unsaturated fatty acids with long-chain alcohols. They are responsible for making the plant and animal tissues water proof and reduces the rate of transpiration in plants.

Q9. What are carotenoids? How they are useful for living organisms?

Ans: The carotenoids are a family of light-absorbing pigments

found in plants and animals. Beta-carotene (β-carotene) is one of the pigments that traps light energy in leaves during photosynthesis. In humans, a molecule of β-carotene can be broken down into two vitamin A molecules, from which we make the pigment rhodopsin, which is required for vision. Carotenoids are responsible for the colors of carrots, tomatoes, pumpkins, egg yolks, and butter.

Q10. What are vitamins? Name three fat-soluble vitamins?

Ans: Vitamins are naturally occurring essential organic constituents of the diet which in minute amounts aid in maintaining the normal activities of the tissues. They are organic compounds of varying complexity that cannot be synthesized in the body. They are essential for normal cellular function in samm quantities in diet. The fat-soluble vitamins are A, D, E and K.

Q11. What are amphipathic molecules?

Ans: The amphipathic molecule refers to the presence of both hydrophilic and hydrophobic groups within the same molecule. The term amphipathy was coined by Hartley in 1936.

Q12. What are the two kinds of subunits that make up a fat molecule?

Ans: The two kinds of subunits that make up a fat molecule are fatty acids and glycerol.

Q13. What are phospholipids?

Ans: Phospholipids are the most important molecules of the cell, as they form the core of all biological membranes. An individual phospholipid is a composite molecule, made up of three kinds of subunits: Glycerol, Fatty acids, and Phosphate group. The charged phosphate group usually has a charged organic molecule linked to it, such as choline, ethanolamine, or the amino acid serine. The phospholipid molecule can be thought of as having a polar "head" at one end (the phosphate group) and two long, very nonpolar "tails" at the other. In water, the nonpolar tails of nearby phospholipids aggregate away from the water, forming two layers of tails pointed toward each other-a lipid bilayer. Lipid bilayers are the basic framework of biological membranes.

Q14. What are prostaglandins? What is their role in living organisms?

Ans: Prostaglandins are a group of about 20 lipids that are modified fatty acids, with two nonpolar "tails" attached to a five-carbon ring. They are found in human seminal fluid, testis, kidney, placenta, uterus, stomach, lung, brain and heart. Prostaglandins act as local chemical messengers in many vertebrate tissues.

Q15. What are sterols?

Ans: The sterols are derivatives of complex ring system called cyclopentanoperhydrophenenthrene. The best known sterol is cholesterol. The term sterol means solid alcohol.