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Please use the internet such as ( Khan academy) or other credible websites to answer the following questions .

Q1- List the four major classes of macromolecules.

- 1.
- 2.
- 3.
- 4.

Q2- Explain the difference between a monomer and a polymer? Give an Example.

Q3- Most polymerization reactions in living things are condensation reactions. Explain the difference between **Condensation reaction** and **Hydrolysis reactions**.

Q4- Sugars are the smallest units in carbohydrates and they serve as fuel and carbon sources. Carbohydrates are classified by the number of simple sugars. **Explain** the difference between Monosaccharide, Disaccharides and polysaccharides.

Q5- Polysaccharides, the polymer of sugars, have storage and structural roles. **Starch** and **glycogen** are two most common storage polysaccharides.

1. **Briefly** describe the structure and function of both polymers.( You can Sketch)

2. What are the major sources in the human diet for starch?

3. Where is glycogen stored in human and other vertebrates?

Q6- Structural polysaccharides include chitin and cellulose. **Explain** the difference in structure and function between cellulose and chitin.

Q7- **Lipids** are diverse group of organic compounds that are **insoluble** in water, but will dissolve in non-polar solvents such as (ether, chloroform and benzene). Important groups are *fats, phospholipids, and steroids*.

*Fats store large amounts of energy that constructed from Glycerol and Fatty acids.*

Describe the structure of a fat macromolecule and make sure to define the terms (fatty acid- Glycerol- Ester linkage-triglyceride). (You can sketch the macromolecule).

Q8- List some of the characteristics for fat.

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Q9- In many commercially prepared food products, unsaturated fats are artificially hydrogenated to prevent them from separating out as oil( e.g., peanut butter, and margarine).

Fat serves many useful functions: list four of these functions.

- 1.
- 2.
- 3.
- 4.

Q10- Explain the difference between saturated and unsaturated fat (give examples).

SATURATED	UNSATURATED
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Q11- Explain the difference between Phospholipids and steroids in structure and function.  
(Give examples).

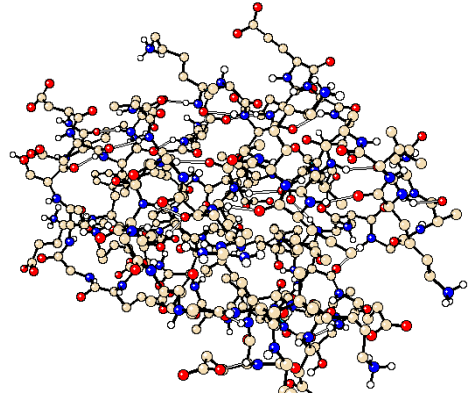
**Q12- Proteins: The molecular tools of the cell**

***Polypeptide chains*** =are polymers of amino acids that are arranged in a specific linear sequence and are linked by peptide bonds.

**Protein**=A macromolecule that consists of one or more polypeptide chains folded and coiled into specific conformations.

Please list eight varied and important functions in the cell.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.



Q13- Amino acids are the building blocks of a protein. **Explain** and sketch the general structure of an amino acid.

**Briefly** Describe the four different levels of protein structure, and give examples.

1. Primary structure
  
  
  
  
  
  
  
  
  
  
2. Secondary structure

3. Tertiary structure

4. Quaternary structure

Q14- Nucleic Acids: Informational Polymers

Protein confirmation is determined by primary structure, in turn, is determined by genes; hereditary units that consist of DNA, *a type of nucleic acid*.

*There are two types of nucleic acids: DNA and RNA*

**Explain** the difference in structure, function and location of DNA and RNA

DNA	RNA
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Q15- Inheritance is based on precise replication of the DNA double helix. In 1953, James Watson and Francis Crick proposed the *double helix* as the three dimensional structure of DNA; **Explain.**