

CBSE Class 12 physics
Important Questions
Chapter 14
Biomolecules

2 Mark Questions

1. How are amino acids classified?

Ans. Amino acids are classified as essential and non – essential amino acids.

The amino acids which can be synthesized in the body are known as non – essential amino acids e.g. Aspartic acid, Glycine etc.

The amino acids which cannot be synthesized in the body and must be obtained through diet are known as essential amino acids. E.g. Histidine, lysine.

2. Differentiate between fibrous and globular proteins.

Ans.

Fibrous Proteins	Globular Proteins
1. Their molecules have long thread like structure.	1. They have folded ball – like structure
2. they have helical or sheet structures	2. They may have three dimensional Shapes.
3. They are insoluble in water but soluble in strong acids and bases. e.g. Keratin, fibroin etc.	3. They are soluble in water, acids and Bases and salts. e.g. Egg albumin, casein insulin.

3. Differentiate between α - helical and β - pleated sheet structure.

Ans.

α - helical structure	β - pleated sheet structure

1. In this structure, formation of hydrogen Bonding between amide groups within the same chain causes the peptide chains to coil up into a spiral structure like a right handed screw.
e.g. α - keratin, skin, wool etc.

1. In this structure, the long peptide chains lie side by side in a zig-zag manner to form a flat sheet. Each chain is held to the two neighboring Chains by hydrogen bonds. These sheets can slide upon one another in three dimensional structures.
e.g. fibroin present in silk etc.

4. What do you understand by secondary structure of proteins?

Ans. The secondary structure of protein refers to the shape in which a long polypeptide chain can exist arising due to regular folding of the backbone of poly peptide chain due to hydrogen bonding between $>C=O$ and $-N-H$ group of poly peptide chain.

5. What is denaturation of proteins? Explain with examples.

Ans. Disruption of the native conformation of a protein by changing its environment like PH value, temperature etc. resulting into loss of its biological activity is called denaturation of proteins. During denaturation, secondary and tertiary structures get destroyed while primary structure remains same e.g., coagulation of egg albumin by boiling.

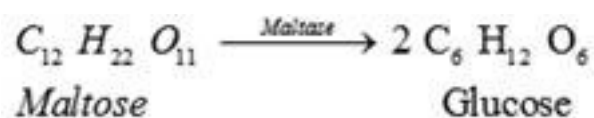
6. How are enzymes named? Give an example.

Ans. Enzymes are generally named after the compound upon which they work. e.g. enzyme that catalyses the hydrolysis of maltose into glucose is named maltase.

Some times enzymes are named after the reaction where they are used. e.g. the enzymes which catalyze reduction of other is called oxidoreductase.

7. Give an example of enzyme catalysed reaction.

Ans. Example of enzyme catalysed reaction –



8. What are vitamins? Give two examples.

Ans. Vitamins are organic compounds required in the diet in small amounts to perform specific biological functions for normal maintenance of optimum growth and health of the organism. e.g. vitamins A, B, C, D etc.

9. How are vitamins classified?

Ans. Vitamins are classified into two groups depending upon their solubility's-

(i) Fat soluble vitamins – which are soluble in fats and oils. e.g. vitamins A, D, E & K.

(ii) Water soluble vitamins – which are soluble in water e.g. vitamins B & C.

10. Write the disease caused by deficiency of vitamins A, B_1 , B_6 , B_{12} , C, D E and K.

Ans.

Vitamin	Deficiency disease
A	Xerophthalmia, Night blindness
B_1	digestive disorders
B_6	Convulsions
B_{12}	Pernicious anaemia
C	Scurvy
D	Rickets
E	Muscular weakness
K	Increased blood clotting time.

11. Glucose or sucrose are soluble in water but cyclohexane or benzene (simple six membered ring compounds) are insoluble in water. Explain.

Ans. A glucose molecule contains five -OH groups while a sucrose molecule contains eight -OH groups. Thus, glucose and sucrose undergo extensive H-bonding with water.

Hence, these are soluble in water.

But cyclohexane and benzene do not contain -OH groups. Hence, they cannot undergo H-bonding with water and as a result, are insoluble in water.

12. What is glycogen? How is it different from starch?

Ans. Glycogen is a carbohydrate (polysaccharide). In animals, carbohydrates are stored as glycogen.

Starch is a carbohydrate consisting of two components - amylose (15 - 20%) and amylopectin (80 - 85%).

However, glycogen consists of only one component whose structure is similar to amylopectin. Also, glycogen is more branched than amylopectin.

13. What are essential and non-essential amino acids? Give two examples of each type.

Ans. Essential amino acids are required by the human body, but they cannot be synthesised in the body. They must be taken through food. For example: valine and leucine

Non-essential amino acids are also required by the human body, but they can be synthesised in the body. For example: glycine, and alanine

14. What type of bonding helps in stabilising the α -helix structure of proteins?

Ans. The H-bonds formed between the -NH group of each amino acid residue and the $\text{C}=\text{O}$ group of the adjacent turns of the α -helix help in stabilising the helix.

15. What is the effect of denaturation on the structure of proteins?

Ans. As a result of denaturation, globules get unfolded and helixes get uncoiled. Secondary and tertiary structures of protein are destroyed, but the primary structures remain unaltered. It can be said that during denaturation, secondary and tertiary-structured proteins get converted into primary-structured proteins. Also, as the secondary and tertiary structures of a protein are destroyed, the enzyme loses its activity.

16. How are vitamins classified? Name the vitamin responsible for the coagulation of blood.

Ans. On the basis of their solubility in water or fat, vitamins are classified into two groups.

(i) Fat-soluble vitamins: Vitamins that are soluble in fat and oils, but not in water, belong to this group. For example: Vitamins A, D, E, and K

(ii) Water-soluble vitamins: Vitamins that are soluble in water belong to this group. For example: B group vitamins (B_1 , B_2 , B_6 , B_{12} , etc.) and vitamin C

However, biotin or vitamin H is neither soluble in water nor in fat.

Vitamin K is responsible for the coagulation of blood.

17. Why are vitamin A and vitamin C essential to us? Give their important sources.

Ans. The deficiency of vitamin A leads to xerophthalmia (hardening of the cornea of the eye) and night blindness. The deficiency of vitamin C leads to scurvy (bleeding gums).

The sources of vitamin A are fish liver oil, carrots, butter, and milk. The sources of vitamin C are citrus fruits, *amla*, and green leafy vegetables.

18. The two strands in DNA are not identical but are complementary. Explain.

Ans. In the helical structure of DNA, the two strands are held together by hydrogen bonds between specific pairs of bases. Cytosine forms hydrogen bond with guanine, while adenine forms hydrogen bond with thymine. As a result, the two strands are complementary to each other.

19. What are the different types of RNA found in the cell?

Ans. (i) Messenger RNA (m-RNA)

(ii) Ribosomal RNA (r-RNA)

(iii) Transfer RNA (t-RNA)