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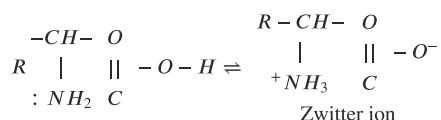
Chemistry Class 12 NCERT Solutions: Chapter 14 Biomolecules Part 5

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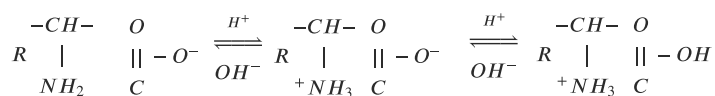
Q: 16. How do you explain the amphoteric behaviour of amino acids?

Answer:

In aqueous solution, the carboxyl group of an amino acid can lose a proton and the amino group can accept a proton to give a dipolar ion known as zwitter ion.



Therefore, in zwitter ionic form, the amino acid can act both as an acid and as a base.



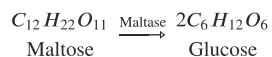
Thus, amino acids show amphoteric behaviour.

Q: 17. What are enzymes?

Answer:

Enzymes are proteins that catalyse biological reactions. They are very specific in nature and catalyse only a particular reaction for a particular substrate. Enzymes are usually named after the particular substrate or class of substrate and sometimes after the particular reaction.

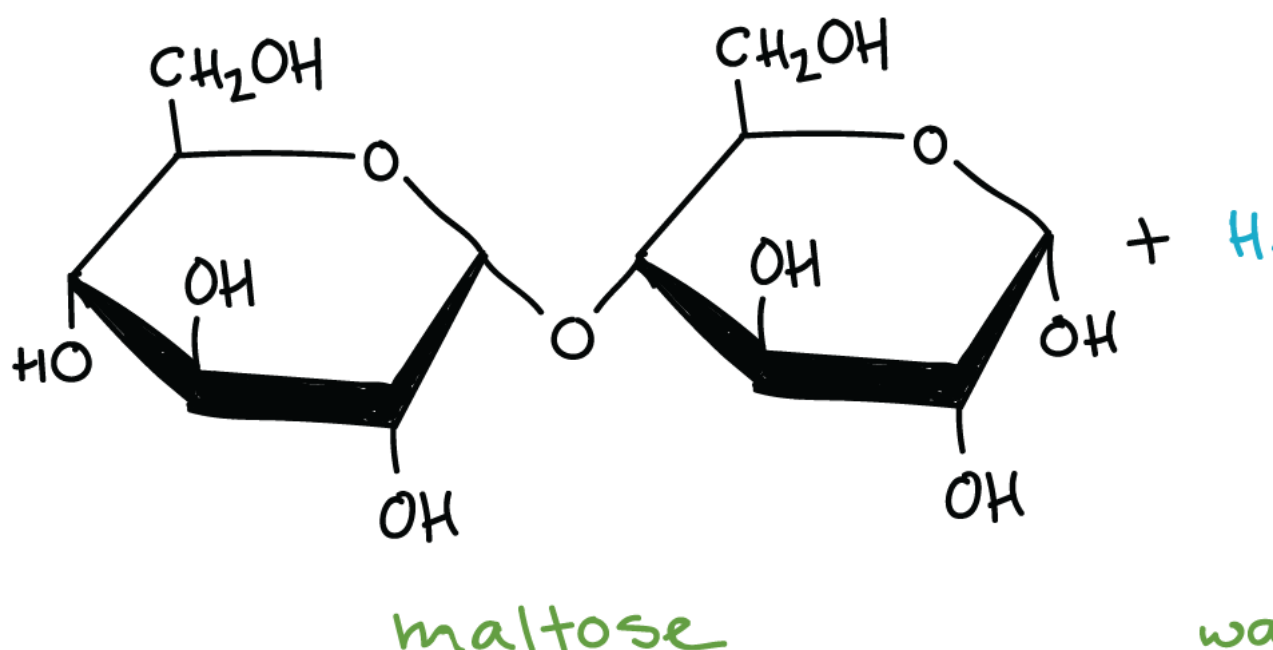
For example, the enzyme used to catalyse the hydrolysis of maltose into glucose is named as maltase.



Again, the enzymes used to catalyse the oxidation of one substrate with the simultaneous reduction of another substrate are named as oxidoreductase enzymes.

The name of an enzyme ends with ' - ase ' .

HYDROLYSIS



Q: 18. What is the effect of denaturation on the structure of proteins?

Answer:

As a result of denaturation, globules get unfolded and helices 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.

Q: 19. How are vitamins classified? Name the vitamin responsible for the coagulation of blood.

Answer:

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.

Q: 20. Why are vitamin A and vitamin C essential to us? Give their important sources.

Answer:

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.

Q: 21. What are nucleic acids? Mention their two important functions.

Answer:

Nucleic acids are biomolecules found in the nuclei of all living cells, as one of the constituents of chromosomes. There are mainly two types of nucleic acids – deoxyribonucleic acid (DNA) and ribonucleic acid (RNA). Nucleic acids are also known as polynucleotides as they are long-chain polymers of nucleotides.

Two main functions of nucleic acids are:

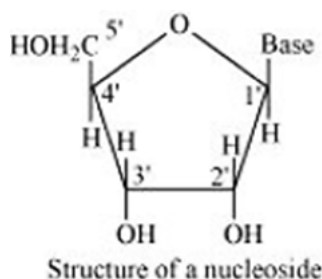
(i) DNA is responsible for the transmission of inherent characters from one generation to the next. This process of transmission is called heredity.

(ii) Nucleic acids (both DNA and RNA) are responsible for protein synthesis in a cell. Even though the proteins are actually synthesised by the various RNA molecules in a cell, the message for the synthesis of a particular protein is present in DNA.

Q: 22. What is the difference between a nucleoside and a nucleotide?

Answer:

A nucleoside is formed by the attachment of a base to 1' position of sugar. Nucleoside = Sugar + *Base*



On the other hand, all the three basic components of nucleic acids (i.e., pentose sugar, phosphoric acid, and base) are present in a nucleotide.

Nucleotide = Sugar + *Base* + Phosphoric acid

