

Exemplar Problems with Solution

11. Each polypeptide in a protein has amino acids linked with each other in a specific sequence. This sequence of amino acids is said to be _____.

- (i) primary structure of proteins.
- (ii) secondary structure of proteins.
- (iii) tertiary structure of proteins.
- (iv) quaternary structure of proteins.

Ans: i

70. Explain the terms primary and secondary structure of proteins. What is the difference between α -helix and β -pleated sheet structure of proteins?

Ans: Primary structure of proteins: Proteins may have one or more polypeptide chains. Each polypeptide is a protein that has amino acids linked with each other in a specific sequence and it is this sequence of amino acids that are said to be the primary structure of that protein. Any change in this primary structure i.e, the sequence of amino acids creates a different protein.

Secondary structure of Proteins: The secondary structure of proteins refers to the shape in which a long polypeptide chain. The secondary can exist. They are found to exist in two different types of structures viz. α - helix and β pleated sheet structure. These structures arise due to the regular folding of the backbone of the polypeptide chain due to hydrogen bonding between carbonyl group and $-\text{NH}-$ groups of the peptide bond. α - Helix is one of the most common ways in which a polypeptide chain forms all possible hydrogen bonds by twisting into a right-handed screw (helix) with the carbonyl and $-\text{NH}$ group of each amino acid residue hydrogen-bonded to the ($>\text{C}=\text{O}$) of an adjacent turn of the helix.

In β - structure all peptide chains are stretched out to nearly

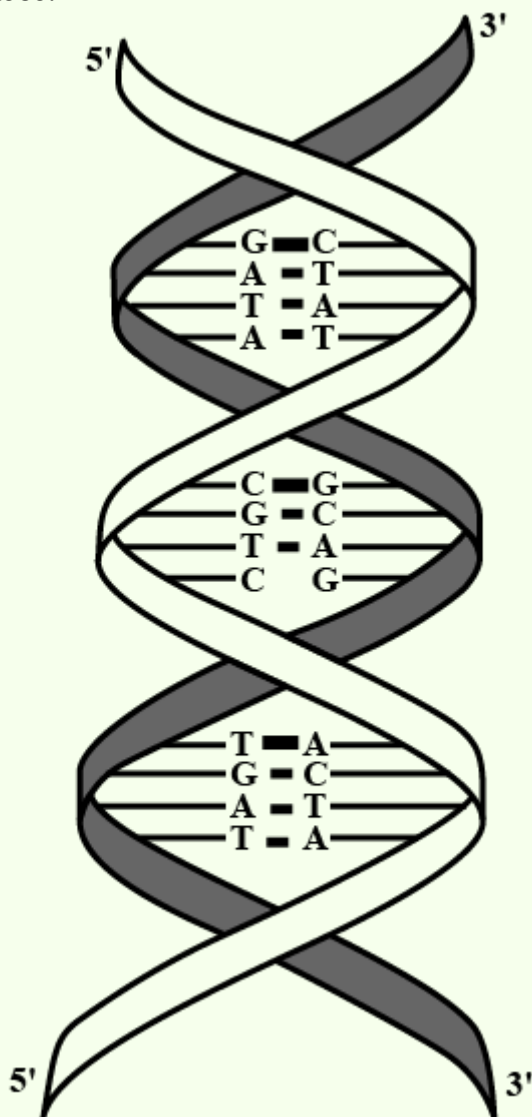
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maximum extension and then laid side by side are held together by intermolecular hydrogen bonds.

71. Write the structures of fragments produced on complete hydrolysis of DNA. How are they linked in DNA molecule? Draw a diagram to show pairing of nucleotide bases in double helix of DNA.

Ans: Complete the hydrolysis of DNA (or RNA) yields a pentose sugar, phosphoric acid, and nitrogen-containing heterocyclic compounds (called bases). In DNA molecules, the sugar moiety is β -D-2 deoxyribose.

Two nucleic acid chains are wound about each other and held together by hydrogen bonds between pairs of bases. The two strands are complementary to each other because the hydrogen bonds are formed between specific pairs of bases.



Double stranded helix structure of DNA

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