
CBSE TEST PAPER-01
CLASS - XI BIOLOGY (Biomolecules)

General Instruction:

- All questions are compulsory.
 - Questions no. 1 to 3 carry one mark each. Questions no. 4 to 6 carry two marks each. Questions no. 7 and 8 carry three marks each. Question no. 9 and 10 carry five marks.
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1. Which is the important energy carrier in the cell? Where is it formed?
2. Name the monomer subunits which form nucleic acids on polymerization?
3. What are macromolecules? Give example.
4. Differentiate between nucleotide & nucleoside?
5. How are glycosidic bonds formed?
6. What do you mean by steady state condition?
7. Enumerate the functions of lipids?
8. Describe the lock & key hypothesis of enzyme action?
9. Explain briefly four levels of protein structure?
10. Define enzymes. Explain how an enzymes cataysed the reaction. Name the factors which affect the rate of enzyme action.

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[ANSWERS]

1. Adenosine Triphosphate (ATP). ATP formed in mitochondria.
2. Nucleotide.
3. Macromolecules are large complex molecules formed by polymerization of micromolecules & have molecular weight more than 800 daltons..
- 4.

NUCLEOTIDE	NUCLEOSIDE
i) Nucleotide is made up of base, sugar & phosphoric acid.	i) Nitrogenous base & sugar form a nucleoside
ii) Nucleotide of RNA is called ribonucleotide & nucleotide of DNA is called deoxyribonucleotide	ii) Nucleoside of RNA is called ribonucleoside & nucleoside of DNA is called deoxyribonucleoside
iii) e.g adenylic acid, guanylic acid, thymidylic acid, uridylic acid	iii) eg. Adenosine, fuanosine, cytidine, thymidine, uridine

5. The glycosidic or ketone group of a monosaccharide can react & bind with an alcoholic group of another organic compound to join the two compounds together. This bond is known as glycosidic bond.
6. An open system always remains in steady state i.e. the rate of in put of energy & matter is always equal to the output of energy & matter.
7. i) Most of the plants & animals fats constitute storage compound. Fat is stored mainly in adipose cells in the animals.
ii) In oil seed plants, oil provides nourishment to developing embryo during seed germination. Oil extracted from these seeds is used in cooking.

iii) Fats provide energy to the body.

iv) Fats serve as insulators & protect body from cold. It gets deposited underneath skin.

v) Phospholipid form an structural component of all bio- membranes in cell.

vi) Cholesterol acts as precursor for synthesis of various hormones, vitamins & bile salts.

vii) The lipid form the white matter, grey matter of brain & myelin sheath of neurons.

8. According to Fischer's lock & key hypothesis of enzyme action:- if the right key fits in the right lock, the lock can be opened otherwise not. To explain the above in context with enzyme action it is believed that molecules have specific geometric shapes. Proteins are able to act as enzyme because their shape provides specific configuration into which other molecules can fit. The molecules which are acted upon by the enzymes are called substrates of the enzymes which form the product.

Under the above assumption only those substrate molecule with proper geometric shape can fit into the active site of the enzymes. However, under special circumstances some other molecules which are similar to the substrate can also combine with active site of enzyme. In such cases molecules may compete with substrate & the reaction may either slow down or stop. This is called competitive inhibition.

9. FOUR LEVELS OF PROTEIN STRUCTURE:-

a) PRIMARY STRUCTURE:- The protein exists as a long chain of amino acids arranged in a particular sequence such a polypeptide is non- functional.

b) SECONDARY STRUCTURE:-First amino acid is n-terminal amino acid & last is known as c-terminal amino acid. There is interaction between every fourth amino acid by formation of hydrogen bond the polypeptide is folded in a helical shape eg. keratin. When two or more polypeptide chains are held together by intermolecular hydrogen bonds the structure is known as pleated sheet.

c) TERTIARY STRUCTURE:- The polypeptide becomes stabilized by folding & coating by the formation of ionic bonds or hydrophobic bonds or disulfide bridges. It is called tertiary structure. It gives a three dimensional view of proteins. Biological activity of protein depends on its tertiary structure.

d) QUATERNARY STRUCTURE:- Such proteins are formed of more than one polypeptide or subunits each one having primary secondary & tertiary structure. This is called quaternary structure. Each polypeptide chain functions as subunit of the proteins.

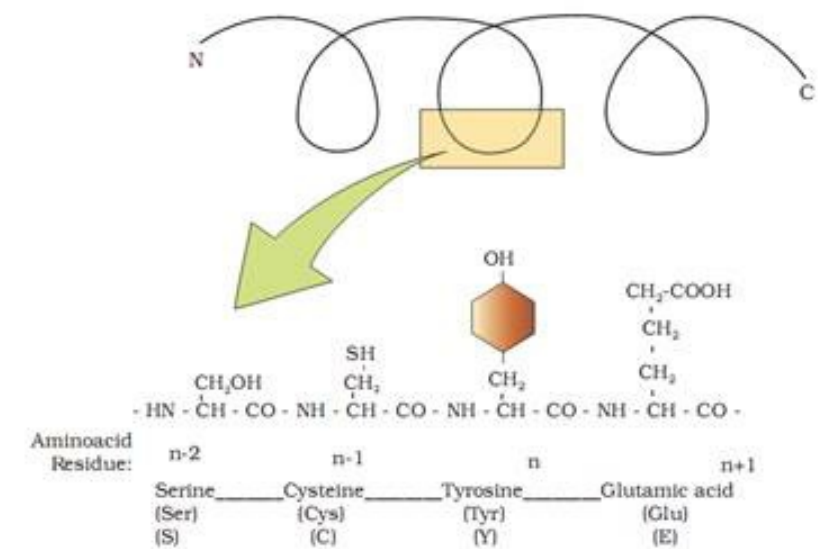


Figure 9.3 Primary structure of a portion of a hypothetical protein. N and C refer to the two termini of every protein. Single letter codes and three letter abbreviations for amino acids are also indicated.

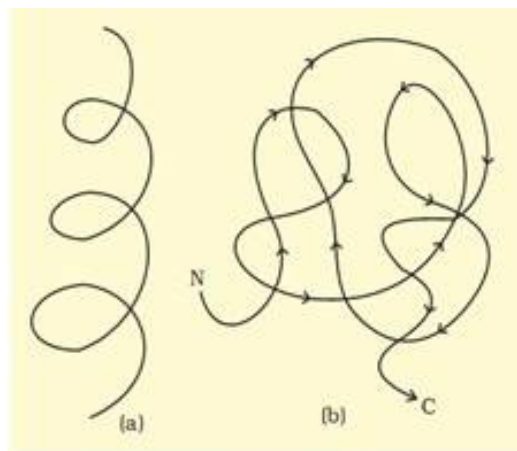


Figure 9.4 Cartoon showing : (a) A secondary structure and (b) A tertiary structure of proteins

Ans.10. Enzymes are those proteins which have catalytic activity to catalysed the reaction. They catalysed the reaction by lowering the activation energy of the reaction which is required to change the transition state of the substrate into product as much as low energy of activation, the speed of reaction is fastest.. The factors which affect the rate of enzymes action are pH, temperature and substrate concentration