

CBSE TEST PAPER-03
CLASS - XI BIOLOGY
(Biomolecules)

General Instruction:

- All questions are compulsory.
 - Question No. 1 to 4 carry one mark each. Questions no. 5 to 9 carry two marks each. Questions No. 10 to 11 carry three marks each.
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1. Name the most abundant protein in biosphere?
2. Lipids are not considered as biomacromolecules, why?
3. Which lipid can cause heart ailment?
4. What are micro- nutrients?
5. Enlist three properties of enzymes?
6. Enumerate differences between DNA & RNA?
7. Why are monosaccharide's sugars are known as reducing sugars?
8. How does temperature affects enzyme catalysed reaction?
9. What is enzymatic competitive inhibition? Give one example?
10. How does enzymes brings about high rate of chemical conversions?
11. What are nucleic acids? Describe the structure of DNA.

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[ANSWERS]

1. RuBisCO

2. Those molecules which have a molecular weight more than 800 daltons are considered as biomacromolecules. Lipids are not biomacromolecule because their molecular weight does not exceed 800.

3. Cholesterol.

4. Minerals required by plants in trace quantity but essential for organisms. are called micronutrients eg. Mn, Co, Zn, B, etc.

5. i) An enzyme is specific for a substrate & catalysed only a particular reaction because of the specific shape of active site & substrate.

ii) Every enzyme requires an optimum temperature for its functioning.

iii) The enzymes are sensitive to pH & each enzyme shows its maximum activity at a specific pH called optimum pH.

6.

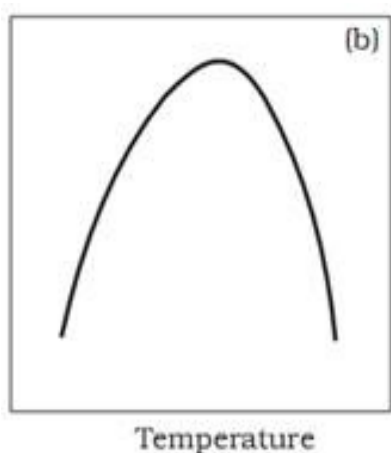
DNA	RNA
i) It consists of a double helical of two polynucleotide chains	i) It consists of only one helical of single polynucleotide chain.
ii) Deoxyribose sugar is present in the nucleotide.	ii) Ribose sugar is present in nucleotide
iii) Pyrimidine bases are thymidine & cytosine.	iii) Pyrimidine bases are uracil & cytosine
iv) DNA contains all the genetic information	iv) RNA helps in protein synthesis.

v) DNA is the genetic material of most of the organisms

v) RNA is the genetic material in viruses.

7. Monosaccharides sugars are called reducing sugars because they have a free aldehyde or ketone group & can reduce Cu^{2+} to Cu^+ . Disaccharides like sucrose does not reduce Cu^{2+} to Cu^+ so, it not a reducing sugar.

8. The temperature affects the velocity of enzyme action. When the temperature is high, there is a sudden decrease in enzyme action due to denaturation of emzymes. Mostly enzymatic reactions occur around 30-35 degree celsius.

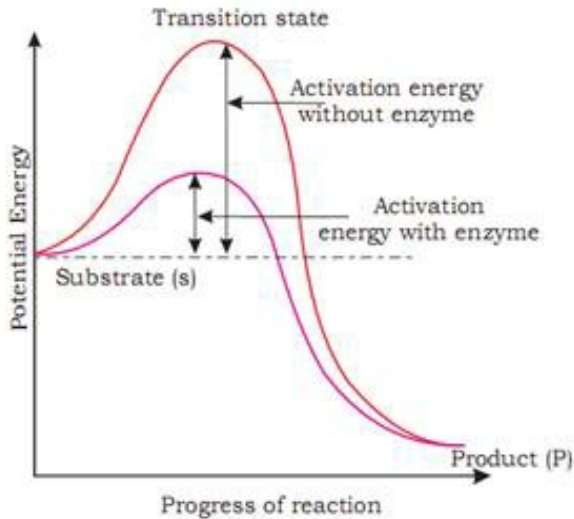


9. Some chemicals prevent the enzyme to function either competitively or non-competetively, are known as inhibitors. Enzymatic competitive inhibition is done by the substrate which very closely resembles the substrate in its molecular structure.

Enzyme + Inhibitor \rightarrow Enzyme inhibitor complex.

Eg. Malonate inhibits the action of succinate dehydrogenase because it shows close resemblance with succinate substrate.

10. A chemical that is converted into a product on the action of emzyme is known as the substrate. Therefore the enzymes with tertiary structures including an active site convert a substrate into a product. The substrate 'S' must bind enzymes at its active site within a given cleft. So an obligatory formation of an ES substrate complex occurs. At a state when the substrate is bound to an enzyme active site, a new structure of substrate is formed.



In the graph, if 'P' is at lower level than 'S' reaction is exothermic i.e. energy is supplied to make product 'P'. The 'S' has to go through much higher energy state known as "transition state. The enzymes brings down energy barrier making transition of 'S' to 'P' more easy. The difference in average energy content between that of 'S' & this transition state is termed as activation energy.

11. Nucleic acids are found in acid soluble fraction of living tissue. They are linear polymers of deoxyribonucleotides or ribonucleotides A nucleotide has 3 distinct components, nitrogenous base, pentose sugar and phosphate group

DNA is a double stranded structure & each strand is a polymer of deoxyribonucleotide. The backbone of the nucleic acid is uniformly consisting of alternating pentose sugar & phosphate group

i) The steps composed of nitrogenous bases adenine, guanine, cytosine & thymine with hydrogen bonds hold two strands together.

ii) Two strands are complementary to each other.

iii) They run in an antiparallel manner.

iv) It is genetic material in all organisms.

v) It has the property to replicate

vi) At one end of strand, 5-C of pentose sugar is free on other end; 3-C of pentose is free.

