

**Class: 11**  
**Subject: Biology**  
**Topic: Bio - Molecules**  
**No. of Questions: 25**

Q1. Name the abundant proteins in biosphere?

Sol. RUBISCO

Q2. Lipids are not bio macromolecules why?

Sol. Lipids are not bio macromolecule because their molecular weight does not exceed 800.

Q3. Which lipid can cause heart ailment?

Sol. Cholesterol

Q4. What are micro- nutrients?

Sol. Minerals required by plants in trace quantity eg. Mn, Co, Zn, B, etc. are called micronutrients.

Q5. Enlist three properties of enzymes?

Sol. i) An enzyme is specific for a substrate & catalyses 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.

Q6. Enumerate differences between DNA & RNA?

Sol. DNA i) it consists of a double helical of two polynucleotide chains

ii) Deoxyribose sugar is present in the nucleotides.

iii) Pyrimidine bases are thymidine & cytosine.

iv) DNA contains all the genetic information

RNA

i) It consists of only one helical of single polynucleotide chain.

ii) Ribose sugar is present in nucleotide

iii) Pyrimidine bases are uracil & cytosine

iv) RNA helps in protein synthesis.

Q7. Why are monosaccharide's sugars are known as reducing sugars?

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

Q8. How does temperature affects enzyme catalysed reaction?

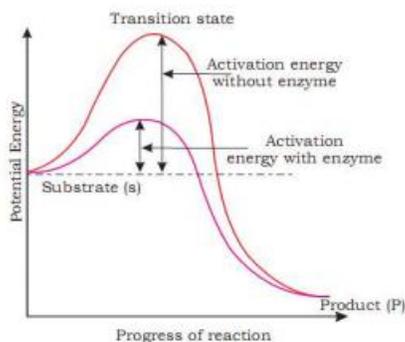
Sol. The temperature affects the velocity of enzyme action. When the temperature is high, there is a sudden decrease in enzyme action due to denaturation. Mostly enzymatic reactions occur below 450c

Q9. What is enzymatic competitive inhibition? Give one example?

Sol. Some chemicals prevent the enzyme to function, are known as inhibitors. Enzymatic competitive inhibition is done by the substrate which very closely resembles the substrate in its molecular structure. Enzyme + Inhibitor = Enzyme inhibitor complex. Eg. malonate inhibits the action of succinate dehydrogenase because it shows close resemblance with succinate substrate.

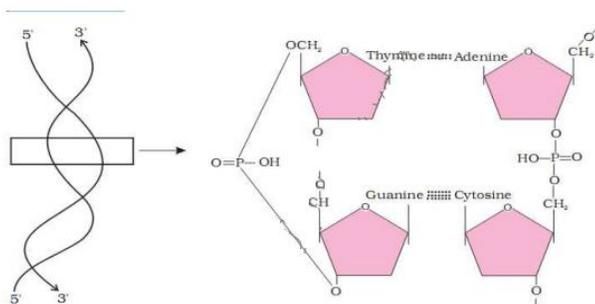
Q10. How does enzymes brings about high rate of chemical conversions?

Sol. A chemical that is converted into a product 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.



Q11. What are nucleic acids? Describe the structure of DNA.

Sol. 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. 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 & 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; third carbon of pentose is free.



Q12. Identify the polymer which makes exoskeleton of insects.

Sol. Chitin a polymer of glucosamine that forms exoskeleton of insects,

Q13. Name the following:- i) sugar present in DNA ii) Base not found in DNA

Sol. i) Deoxyribose sugar ii) Uracil

Q14. Why proteins are called biological polymer?

Sol. As proteins are able to perform multiple functions eg. Protection, mechanical support, transportation, movement etc, they are called as biological polymers.

Q15. Which molecule has the capacity to duplicate?

Sol. Deoxyribonucleic acid (DNA)

Q16. What is metabolism? Mention the role of enzymes in metabolism?

Sol. Metabolism is defined as the sum total of the living processes in the body. Enzymes direct metabolic pathways. Enzymes act as catalysts. Enzymes are highly specialized organic catalysts produced by living cells. Biochemical pathways refer to the reactions occurring in the cells in sequences. Enzymes guide the biochemical pathways along desired directions. They have active sites. The substrate binds at the active site of the enzyme & forms an enzyme-substrate complex.

Q17. Why are enzymes called as biocatalysts?

Sol. The substances which change the rate of chemical reaction without altering the equilibrium point of reaction are called catalysts. The catalysts of the organism are called enzymes & they are synthesized in the living cell. Hence called as biocatalysts.

Q18. Give the functions of carbohydrates?

Sol. i) Carbohydrates play a role in all metabolic reactions of the body & are formed as intermediate compounds in pathways of the processes. ii) Ribose & deoxyribose sugar are found in nucleic acids. iii) Glucose is oxidized in respiration to yield energy. iv) Glucose is used in the synthesis of fats as well as proteins.

Q19. What do you mean by activation energy?

Sol. Activation energy is the energy required to initiate a chemical or biochemical reaction. Activation energy overcomes the energy barriers of the reactants which occurs amongst the reactants due to i) presence of electrons over their surface ii) absence of precise & forceful collisions essential for bringing the reactive sites of the chemical together.

Q20. List the different types of lipids.

Sol. Lipids are of three types:- i) Simple lipids:- they are of alcohols or triglycerides containing fatty acid & glycerol. ii) Compound lipids:- They are simple lipids with a biologically active compound in them e.g. glycolipids ( carbohydrate lipid) lipoprotein ( protein + lipids) iii) Derived lipids:- They are hydrolyzed products of simple lipids such as fatty acids & alcohol.

Q21. Which one of the following is the wrong statement?

- (a) Phosphorus is a constituent of cell membranes, certain nucleic acids and all proteins
- (b) Nitrosomonas and Nitrobacter are chemoautotrophs
- (c) Anabaena and Nostoc are capable of fixing nitrogen in free-living state also
- (d) Root nodule forming nitrogen fixers live as aerobes under free-living conditions

Sol. (a)

Q22. Which one is the most abundant protein in the animal world?

- (a) Collagen
- (b) Insulin
- (c) Trypsin
- (d) Haemoglobin

Sol. (a)

Q23. The catalytic efficiency of two different enzymes can be compared by the

- (a) Molecular size of the enzyme
- (b) The PH optimum value
- (c) The  $K_m$  value
- (d) Formation of the product

Sol. (c)

Q24. Which one of the following amino-acids was not found to be synthesized in Miller's experiment?

- (a) Glutamic acid
- (b) Aspartic acid
- (c) Glycine
- (d) Alanine

Sol. (a)

Q25. Example of a typical homopolysaccharide is

- (a) Inulin
- (b) Suberin
- (c) Lignin
- (d) Starch

Sol. (d)

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