

**Chapter-01**  
**BIOMOLECULES**

**Each question carry one score**

- ..... is the most abundant protein in the animal world.
- ..... is the most abundant protein in the whole biosphere
- Expand the following  
a)DNA b)RNA
- Famous double helical structure of DNA is proposed by.....and .....
- Select the wrongly matched pair from the following?

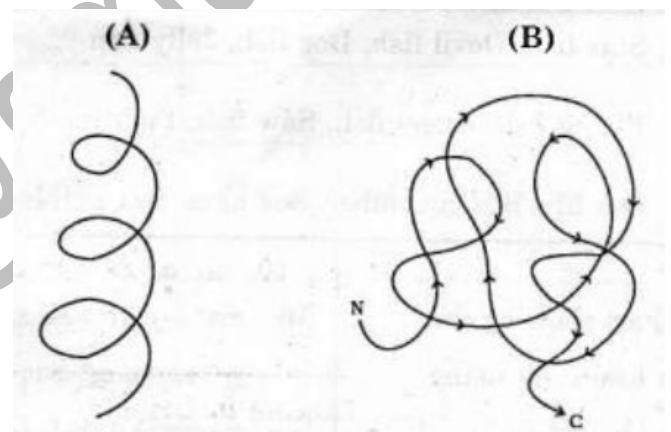
Collagen	Intercellular ground substance
Insulin	Hormone
Antiody	Sensory reception
Trypsin	Enzyme

- .....is a protein helps in the transport of glucose in to the cell
- Which of the following protein act as the inter cellular ground substance  
a)Insulin b)Collagen c)Glut-4 d)Trypsin
- The back bone in DNA is formed by  
a)Sugar-Nitrogen base  
b)Sugar-Phosphate  
c)Nitrogen base-Phosphate  
d)Hydrogen bond
- What will be the Pitch of B-DNA (in A°)  
a)34 b)3.4 c)20 d)3.4
- In proteins, aminoacids are linked by.....bond
- Name the chemical bond formed between the following  
a. Amino acids in a protein molecule  
b. Sugar and phosphate in a nucleic acid
- Heterocyclic in DNA is called.....  
a)Nitrogen based b)Sugar  
c)Phosphates d)Hydrogen bond
- Fill in the blanks  
a)DNA : Nucleotides  
Proteins:.....  
b)DNA: Deoxyribose  
RNA:.....
- The chemicals that shutoff enzyme activity is called.....

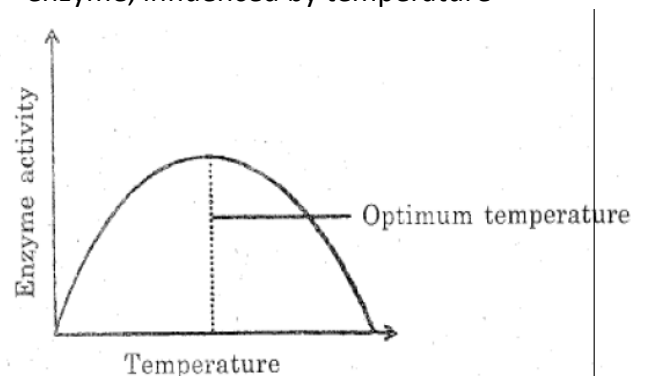
- When you take cells or tissue pieces and grind them with an acid in a mortar and pestle, all the small biomolecules dissolve in the acid. Proteins, polysaccharides and nucleic acids are insoluble in mineral acid and get precipitated. The acid soluble compounds include aminoacids, nucleosides, small sugars etc. When one adds a phosphate group to a nucleoside one gets another acid soluble biomolecule called  
a. Nitrogen base  
b. Adenine  
c. Sugar phosphate  
d. Nucleotide

**Each question carry two score**

- Distinguish between Prosthetic group and coenzyme with an example for each?
- Observe the diagram A and B given below



- What is 'A' and 'B'?
  - Mention the other two levels of protein structure
- Analyze the graph showing the activity of an enzyme, influenced by temperature



- What is meant by optimum temperature?
- Why does enzyme activity declines at too low and at too high temperature

19. Proteins carry many functions in living organism, list any four.
20. Haemoglobin is an iron containing protein present in the RBC.
- How many subunits a haemoglobin have ?
  - Name the sub units in Haemoglobin
  - To which protein structure it belongs
21. Rewrite the given sentences if there is any mistake in the underlined part.
- In a protein chain, the first amino acid is also called as C-terminal amino acid
  - In proteins, only left handed helices are observed.
  - Tertiary structure is absolutely necessary for the many biological activities of proteins.
  - RUBisCO is the most abundant protein in the animal world.
22. "Proteins is a heteropolymer not a homopolymer ". Substantiate the statement?
23. a) Name the biomacromolecule (Polymer) in which peptide bond is present ?
- b) Name the bond present between phosphate and hydroxyl group of sugar in nucleic acid ?
24. When substrate concentration increases, the velocity of enzymatic reaction increases at first. After attaining a maximum velocity, it cannot be exceeded by further addition of substrates. Why ?
25. Metabolites are organic compounds constantly utilized in various metabolic activities in the cells .Write any 2 examples for secondary metabolites ?
26. Match the following

Column A	Column B
Pigment	Lemon grass oil
Alkaloid	Ricin
Essential oil	Anthocyanin
Toxins	Codeine

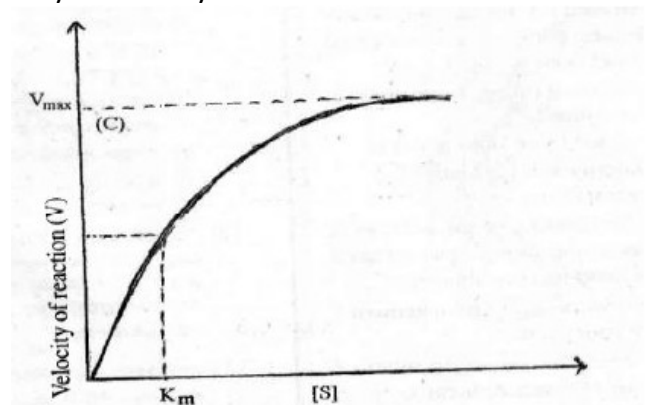
27. Match the following

Column A	Column B
Purine	Deoxyribose
Pyrimidine	Guanine and Cytosine
Sugar in DNA	Adenine and Guanine
Protein	Aminoacids

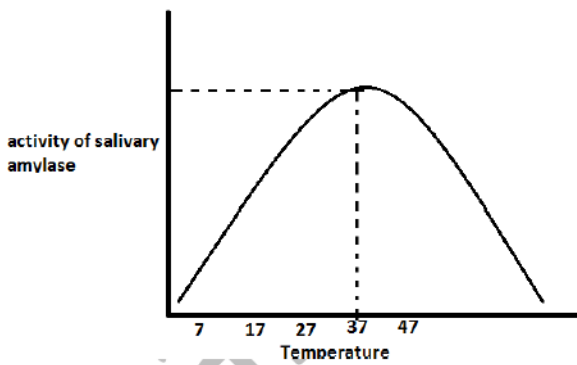
28. Fill in the blanks columns with the correct terms/sentence

A	B
.....(1).....	Catalyse oxiod reduction between 2 substrate
Transferase	.....(2).....
Lyases	Catalyse hydrolysis of ester, glycosidic bond
.....(3).....	Catalyse inter conversion of optical isomers
Ligase	.....(4).....

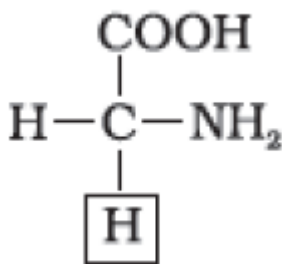
29. Read the following statement and answer the questions
- Succinic dehydrogenase is an enzyme, which catalyse the conversion of succinate to fumarate. During this enzymatic reaction, Ramu added a chemical substance similar to the structure of succinate. This chemical ceased enzymatic reaction
- Name the chemical that shutoff above reaction?
  - What is the use of such chemicals in immunogy?
  - Name the phenomenon for ceasing enzymatic activity.
30. a) Effect of change in concentration of substrate on enzyme activity is graphically represented' After reaching a maximum velocity ( $V_{max}$ )" the reaction is not exceeded by any further rise in concentration of substrate' Explain"
- b) Mention any 2 other factors that affect enzyme activity ?



31. Analyse the graph showing the activity of salivary amylase.

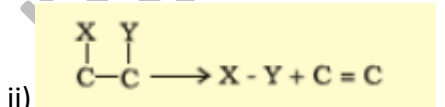
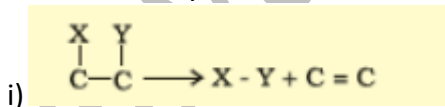


- a. Which is the optimum temperature for salivary amylase from the graph?
  - b. Why the activity declines below the optimum value?
32. The chemical shown below is Glycine-an amino acid

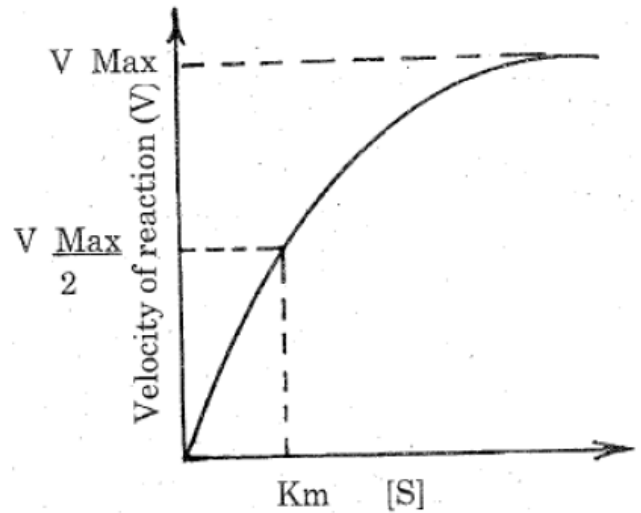


- a. Name the bond produced when another compound of the same category combine with this?
- b. If a number of such molecule bonded together, what will be the resultant molecule?

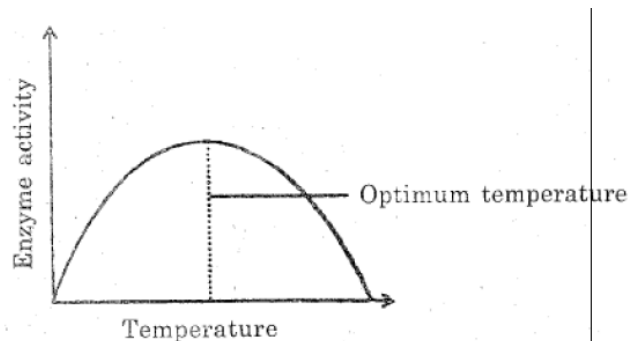
33. a) List out any two factors affecting enzyme activity.  
 b) Based on the reaction formulae given below, identify the classes of the enzymes



- 34. Schematically represent primary, and secondary structures of a Protein
- 35. Based on the graph given below, explain the effect of concentration of substrate on enzyme activity



36. Examples of 2 enzymatic reactions A and B are given. Identify the class of enzyme in A and B
- A) S reduced + S' oxidised → S oxidised + S' reduced. (S,S'- Substrate)
  - B) S - G + S' → S + S' - G (S,S'-substrate, G-Group)
37. Enzymes are proteins. Proteins are long chains of amino acids linked to each other by peptide bonds. Amino acids have many functional groups in their structure. These functional groups are, many of them at least, ionisable. As they are weak acids and bases in chemical nature, this ionization is influenced by pH of the solution. For many enzymes, activity is influenced by surrounding pH. This is depicted in the curve below, explain briefly



38. Give one word
- (i) The nucleic acid that behave like enzymes
  - (ii) The organic compound tightly bound to the apoenzyme
  - (iii) The non-protein organic compound that are tightly bound to the apoenzyme
  - (iv) The protein part of the enzyme

**Each question carry three score**

39. A double stranded DNA consists of 20% adenine. What will be the percentage of Thiamine, Guanine and Cytosine?

40. Name the bond

- a) In a polypeptide or protein, amino acids are linked by.....bond
- b) In a polysaccharide the individual monosaccharides are linked.....bond
- c) In a nucleic acid a phosphate moiety links the 3' Carbon of one sugar of one nucleotide to the 5'-carbon of sugar of the succeeding nucleotide by.....bond

41. DNA is formed of two polynucleotide chain, and each chain made of number of nucleotides

- a) What are the three chemically distinct component in a nucleotide
- b) What are the two types of nitrogen bases in DNA
- c) Sugar in DNA is called.....

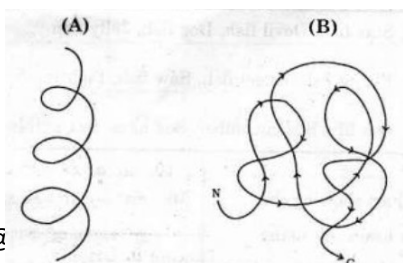
42. Certain features of Protein/Polypeptide chain is given below. Name the structure of protein it belongs

- a) It gives positional information of amino acids in a protein
- b) A polypeptide is coiled to form of a helix (similar to a revolving staircase) the structure
- c) If protein chain is also folded upon itself like a hollow woolen ball, giving rise to the tertiary structure.

43. Match the following

Column A	Column B
Pigment	Abrin
Alkaloid	Carotenoids
Essential oil	Codeine
Toxins	Lemon grass oil
Drugs	Gum
Polymeric substance	Curcumin

- 44. a. Why are proteins heteropolymers?
- b. Identify the proteins from the given list of biomacromolecule and write its functions  
**(Cellulose, starch, antibody, inulin)**
- c. Identify the type of protein structure of a and b



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45. Thousands of enzymes have been discovered, isolated and studied. Most of these enzymes have been classified into different groups based on the type of reactions they catalyse. Enzymes are divided into 6 classes each with 4-13 subclasses and named accordingly by a four-digit number

- a) Name the group of enzyme which catalyse oxidoreduction between two substrates S and S'?
- b) Enzymes catalysing a transfer of a group, G (other than hydrogen) between a pair of substrate S and S'
- c) Enzymes catalysing hydrolysis of ester, ether, peptide, glycosidic, C-C, C-halide or P-N bonds.
- d) Enzymes that catalyse removal of groups from substrates by mechanisms other than hydrolysis leaving double bonds.
- e) Includes all enzymes catalysing inter-conversion of optical, geometric or positional isomers.
- f) Enzymes catalysing the linking together of 2 compounds,

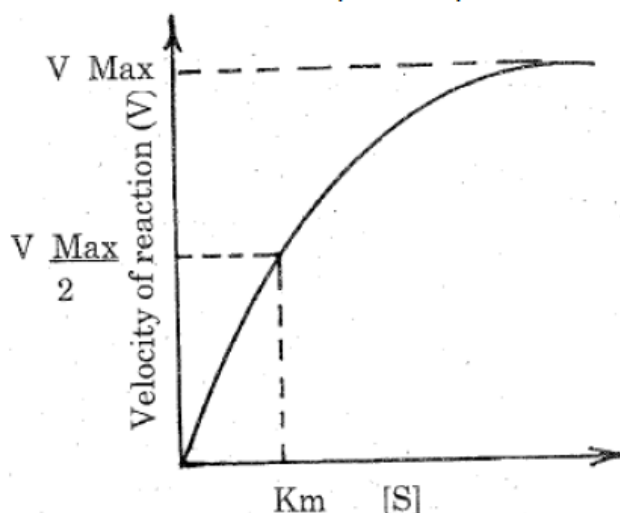
46. Enzymes are biocatalyst capable of promoting biochemical reaction within a living system

- a) What are enzyme inhibitors ?
- b) Give an example for competitive inhibitors
- c) What is the use of competitive inhibitors in immunology

47. A double stranded DNA consist of 100 adenine nucleotide and 100 guanine nucleotide

- a) What will be the total number of nucleotide in that DNA?
- b) What will be the total number of hydrogen bond in this DNA ?
- c) What will be the number of turns in this DNA?

48. Observe the graph



- a. What is meant by 'Vmax' value?
- b. Why is 'Vmax' not exceeded by any further rise in the substrate concentration?
- c. If a chemical substance closely resembling to that of a substrate is introduced into a reaction system, what will be the consequences? Substantiate
- d) What do you mean by Km value of substrate concentration?



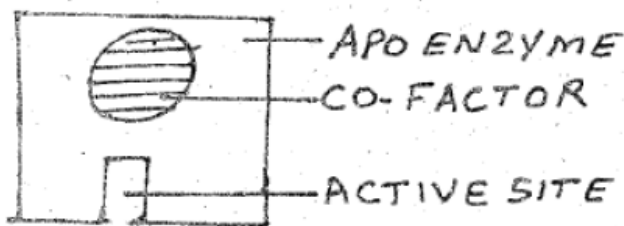
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49. Match the following

Classification of Enzymes	Reactions
A	B
Hydrolases	Oxidation-reduction reaction
Lyases	Linking together of molecules
Oxido-reductase	Transfer of a group
Isomerases	Inter conversion of molecules
Ligases	Removal of groups
Transferases	Hydrolysis of bonds

Symbolic presentation of a functional enzyme is given below

- a. Write one difference between cofactor and apoenzyme?
- b. Name the different types of cofactor
- c. What is the cofactor for the enzyme, carboxypeptidase



50. Non protein constituent called cofactor are bound to the enzyme to make the enzyme catalytically activity
- a. Name the protein portion of the enzyme
  - b. What happens to the catalytic activity when the cofactor is removed from the enzyme?
  - c. Mention any two kinds of cofactor with examples?