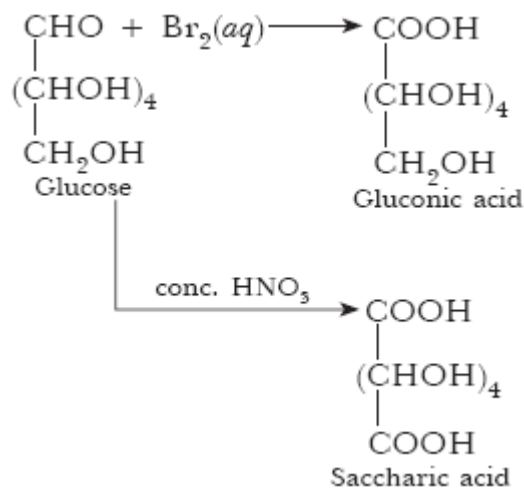


- 1 Which of the two components of starch is water soluble? 1
- ANS: Amylose is water soluble component in starch.
- 2 Which component of starch is a branched polymer of D-glucose and insoluble in water? 1
- ANS: Amylopection.
- 3 What are the products of hydrolysis of maltose? 1
- ANS: 2 moles of Glucose.
- 4 Name the two components of D-glucose which constitute starch. 1
- ANS: Amylose and amylopectin are two components of starch.
- 5 Give an example each of the following: 1
- (i) Reducing sugar
(ii) Non-reducing sugar
- ANS: (i) Glucose (ii) Sucrose
- 6 What is difference between amylose and amylopectin? 1
- ANS: Amylose is water soluble linear polymer of α -glucose. Amylopectin is water insoluble branched chain polymer of α -glucose.
- 7 Why is cellulose not digested in human body? 1
- ANS: Cellulose is not digested in human body because we do not have enzymes which can metabolise cellulose.
- 8 Name the linkage connecting monosaccharide units in polysaccharides. 1
- ANS: Glycosidic linkage.
- 9 Under what conditions glucose is converted to gluconic acid and saccharic acid? 1
- ANS: Bromine water converts glucose to gluconic acid, whereas conc. HNO_3 converts to saccharic acid.



10 Sucrose is dextrorotatory but the mixture obtained after hydrolysis is laevorotatory. Explain. 1

ANS: On hydrolysis, sucrose (dextrorotatory) gives glucose (dextrorotatory +52.5) and fructose (laevorotatory, -92.4°). Since laevorotation of fructose is more than dextrorotation of glucose, therefore, mixture is laevorotatory.

11 Which monosaccharide units are present in starch, cellulose and glycogen and which linkages link these units? 1

ANS: Starch is branched chain polymer of α -glucose, whereas cellulose is linear polymer of β -glucose. Glycogen is polymer of α -glucose. In starch and glycogen, α -glycosidic- α -linkage is present, whereas in cellulose β -glycosidic- β -linkage is present.

12 Write the name of linkage joining two amino acids. 1

ANS: Peptide linkage

13 What type of bonding occurs in β -pleated structure of proteins? 1

ANS: In β -pleated structure, the peptide chains are arranged side by side and these are held by a large number of intermolecular H-bonds between $\begin{array}{c} \text{O} \\ || \\ -\text{C}- \end{array}$ and $-\text{NH}$ groups of peptide bond.

14 What is meant by tertiary structure of proteins? 1

ANS: Tertiary structure of proteins involves further folding and twisting of secondary structure of proteins. It has compact and folded structure. It involves H-bonding, disulphide linkage, ionic or salt bridges and hydrophobic interactions. It has van der Waals' and electrostatic force of attraction.

15 Give an example for each of the fibrous protein and globular protein. 1

ANS: Keratin is fibrous protein and albumin is globular protein.

16 Name the deficiency diseases resulting from lack of vitamins A and E in the diet. 1

ANS: (i) Night blindness is caused by lack of Vitamin A.
(ii) Loss of reproduction power is caused by deficiency of Vitamin E.

17 Out of the following groups, which group has all fat soluble vitamins: (a) A, B-Complex, C, D 1

- (b) A, D, E, K
 (c) K, B-Complex, A, E
 (d) C, A, E, D.

ANS: (b) A, D, E and K are the group of fat-soluble vitamin.

18 Which vitamin is linked with anti-sterility? 1

ANS: Vitamin E.

19 Name the disease caused by deficiency of vitamin B. 2

ANS: Beri-beri is disease caused by deficiency of vitamin B₁.

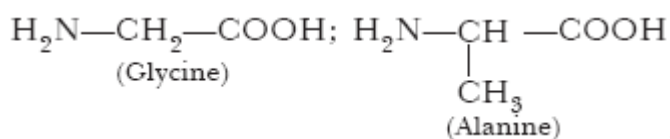
20 Why must vitamin C be supplied regularly in diet ? 1

ANS: Vitamin C is soluble in water, therefore, it is excreted in urine and can't be stored in body, therefore, it should be part of our diet.

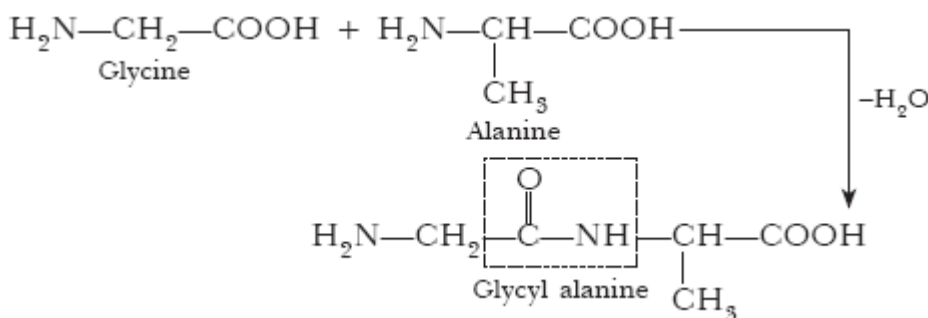
21 How are nucleotides linked together in nucleic acid? 1

ANS: Nucleotides are linked in nucleic acids through phosphodiester linkage between 5' and 3' carbon atoms of pentose sugar.

22 Structures of glycine and alanine are given here.



Show the peptide linkage in glycylalanine.



ANS:

23 What type of linkage is present in nucleic acid? 1

ANS: Phosphodiester linkage.

24 What is essentially the difference between α-form of glucose and β-form of glucose? Explain. 2

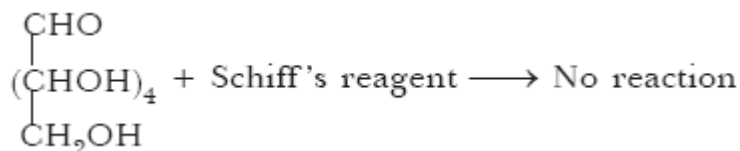
ANS: (i) α-glucose and β-glucose differ in position of -OH group on C-1, therefore, these are called anomers.

(ii) They differ in specific rotation (optical rotation).

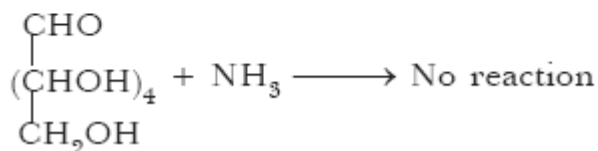
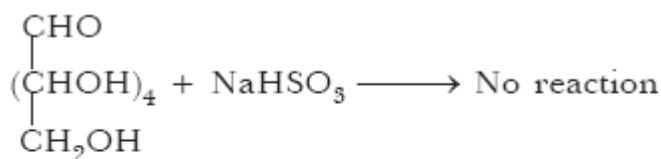
(iii) They differ in melting points.

25 Write such reactions and facts about glucose which cannot be explained by its open chain structure. 2

ANS: (i) Glucose does not respond to Schiff 's reagent test.



(ii) It does not react with sodium bisulphite and ammonia.



26 Name the sugar present in milk. How many monosaccharide units are present in it? What are such oligosaccharides called? 2

ANS: Lactose is present in milk. It is made up of two monosaccharide units. Such oligosaccharides are called disaccharides.

27 Which sugar is called invert sugar? Why is it called so? 2

ANS: Mixture of glucose and fructose is called invert sugar. It is called invert sugar because dextrorotatory sucrose gives mixture of glucose and fructose on hydrolysis which is leavorotatory, therefore, it is called invert sugar.

28 State what you understand by primary structure and secondary structure of proteins. 2

ANS: Primary Structure of Protein: The sequence in which the amino acids are arranged in a protein is called the *primary structure of protein*.

Secondary Structure of Protein: The polypeptide chain gets folded due to intramolecular hydrogen bonding between the carboxyl and amino groups. In an α -helix, the peptide chain coils and the turns of the coil are held together by hydrogen bonds. Another type of secondary structure is possible in which the protein chains are stretched out. This is the β -pleated sheet structure.

29 What are vitamins? Deficiency of which vitamin causes
(i) Pernicious anaemia?
(ii) Convulsions? 2

ANS: Vitamins: Vitamins are the group of organic compounds which are required in very small amounts for the healthy growth and functioning of animal organism. They cannot be made by organism and so have to be part of our diet. The deficiency of a vitamin can cause a specific disease, e.g.

(i) Vitamin B₁₂ deficiency causes pernicious anaemia
(ii) Vitamin B₆ deficiency causes convulsion.

30 Name two water soluble vitamins, their sources and the diseases caused due to their deficiency in diet. 2

ANS: Water soluble vitamins : Vitamin B-complex, Vitamin C.

Vitamins	B ₁ (Thiamine)	C (Ascorbic acid)
Sources	Milk/rice/ yeast	Citrus fruits
Deficiency diseases	Beri-Beri	Scurvy

31 Name two fat soluble vitamins, their sources and the diseases caused due to their deficiency in diet. 2

ANS:

Fat-soluble vitamins	Sources	Deficiency Diseases
1. Vitamin A	Fish liver oil, carrot	Night blindness
2. Vitamin D	Exposure to sunlight, fish and egg yolk	Rickets
3. Vitamin E	Green vegetables, oil, egg yolk, wheat, animal tissues.	Sterility (impotency) and muscular atrophy
4. Vitamin K	Carrots, lettuce, cabbage, tomatoes, liver, egg yolk, cheese, synthesized by colon bacteria.	Haemorrhages, excessive bleeding in injury, poor coagulation of blood

32 Write the main structural difference between DNA and RNA. Of the two bases, thymine and uracil, which one is present in DNA? 2

ANS:

DNA	RNA
(i) It has double helix structure.	(i) It has single helix structure.
(ii) It has deoxyribose sugar.	(ii) It has ribose sugar.

DNA

contains Thymine.

33 Name the bases present in RNA. Which one of these is not present in DNA? 2

ANS: Uracil, Cytocine, Guanine and Adenine are present in RNA. Uracil is not present in DNA.

34 Write the main structural difference between DNA and RNA. Of the four bases, name those which are common to both DNA and RNA. 2

ANS: DNA has double helix structure, whereas RNA is single helix. Adenine, Guanine, Cytocine are bases common to both RNA and DNA.

35 Name the four bases present in DNA. Which one of these is not present in RNA? 2

ANS: DNA contains, Adenine, Thymine, Guanine and Cytosine. Thymine is not present in RNA. Instead of Thymine RNA contains Uracil.

36 Explain what is meant by the following:

- (i) Peptide linkage
- (ii) Pyranose structure of glucose

2

ANS: (i) $\text{—}\overset{\text{O}}{\parallel}{\text{C}}\text{—NH}$ bond is called peptide linkage, present between amino acids in proteins and polypeptide. (ii) Pyranose Structure of Glucose:

37

Answer the following:

- (i) What type of linkage is responsible for the primary structure of proteins?
 (ii) Name the location where protein synthesis occurs in our body.

2

ANS: (i) Peptide linkage (ii) Cytoplasm

38

What is essentially the difference between α -glucose and β -glucose? What is meant by pyranose structure of glucose?

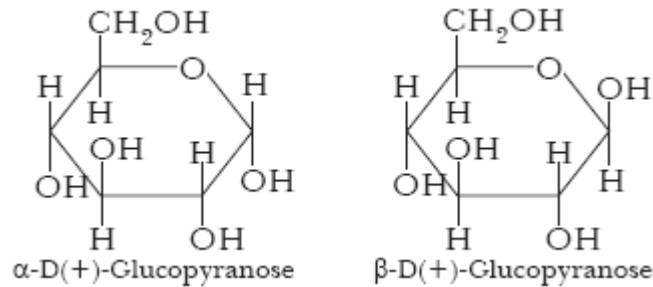
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ANS:

α -Glucose	β -Glucose
(i) It has optical rotation $+111^\circ$.	(i) It has optical rotation 19.2° .
(ii) It has melting point 419 K.	(ii) It has melting point 423 K.

The

six membered cyclic structure of glucose is called pyranose structure.

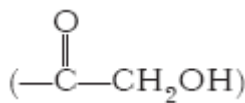


39

How can reducing and non-reducing sugars be distinguished? Mention the structural feature characterising reducing sugars.

3

ANS: Those carbohydrates which reduce Tollens' reagent to give silver mirror or form brick red ppt. with Fehling's solution are called reducing sugars, whereas those which do not are non-reducing sugars. All monosaccharides are reducing sugars due to presence of aldehyde group or α -keto.



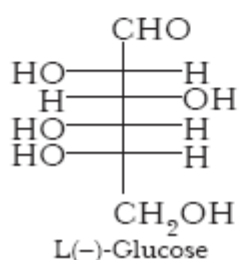
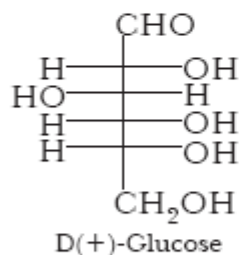
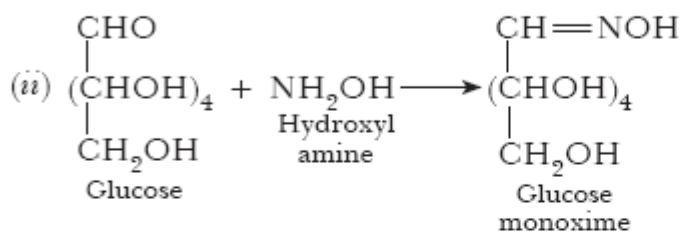
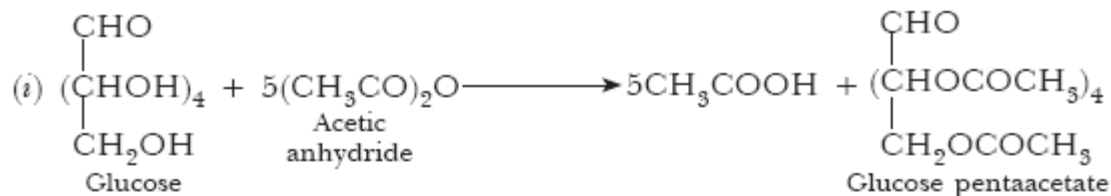
Those disaccharides like sucrose are not reducing sugar because aldehydic and ketonic groups are linked and not free.

All polysaccharides are not reducing.

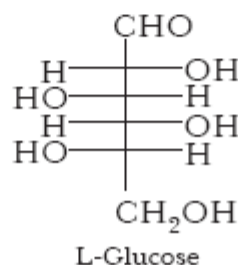
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Write the chemical reaction equations for the reactions of glucose with (i) acetic anhydride, (ii) NH_2OH . Also draw Fischer projections of D-glucose and L-glucose.

3



Or



ANS:

41 Amino acids may be acidic, alkaline or neutral. How does this happen? What are essential and non-essential amino acids? Name one of each type. 3

ANS: Acidic Amino Acids: Those amino acids which contain two carboxyl groups and one amino group are called *acidic amino acids*, e.g. Aspartic acid.

Basic or Alkaline Amino Acids: Those amino acids which contain two amino groups and one carboxyl group are called *basic amino acids*, e.g. Arginine.

Neutral Amino Acids: Those amino acids which contain one amino group and one carboxyl group are called *neutral amino acids* e.g. Glycine.

Essential Amino Acids: Those amino acids which are not synthesised by our body are called *essential amino acids*. They must be part of our diet. Their deficiency leads to diseases, such as Kwashiorkor (water balance in the body is disturbed). e.g. Leucine.

Non-essential Amino Acids: They are synthesised by our body. They are also called *dispensable amino acids* e.g. Serine.

42 Name the chemical components which constitute nucleotides. Write any four functions of nucleotides in a cell. 3

ANS: Nucleotides are made up of a heterocyclic base containing nitrogen, a five carbon sugar and a phosphate group, e.g. AMP (adenosine monophosphate), ADP (adenosine diphosphate) and ATP (adenosine triphosphate).

Functions:

- (i) They act as energy carriers.
- (ii) They are monomers of nucleic acid, i.e. DNA and RNA.
- (iii) They store and pass on heredity characteristics.
- (iv) They synthesize proteins.

43 (i) Which one of the following is a disaccharide: Starch, Maltose, Fructose, Glucose? 3

- (ii) What is the difference between fibrous protein and globular protein?
 (iii) Write the name of vitamin whose deficiency causes bone deformities in children.

ANS: (i) Maltose is disaccharide.

- (ii) Fibrous proteins have thread like structure and are insoluble in water. Globular proteins form a-helix and are soluble in water.
 (iii) Vitamin D.

- 44 (i) Which one of the following is a polysaccharide: starch, maltose, fructose, glucose
 (ii) Write one difference between a-helix and b-pleated sheet structures of protein. 3
 (iii) Write the name of the disease caused by the deficiency of vitamin B₁₂.

ANS: (i) Starch

- (ii) α-helix structure has intra-molecular H-bonding in polypeptide chains of globular proteins. β-pleated structure has inter-molecular H-bonding between polypeptide chains of fibrous proteins.
 (iii) Pernicious anaemia.

- 45 (i) Which one of the following is a monosaccharide: starch, maltose, fructose, cellulose 3
 (ii) What is the difference between acidic amino acids and basic amino acids?
 (iii) Write the name of the vitamin whose deficiency causes bleeding of gums.

ANS: (i) Fructose is monosaccharide.

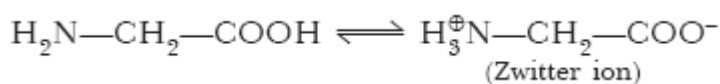
(ii) Acidic amino acids: Those amino acids in which there are two carboxylic acid groups and one amino group are called acidic amino acids.

Basic amino acids: Those amino acids in which there are two amino groups and one carboxylic acid group are called basic amino acids.

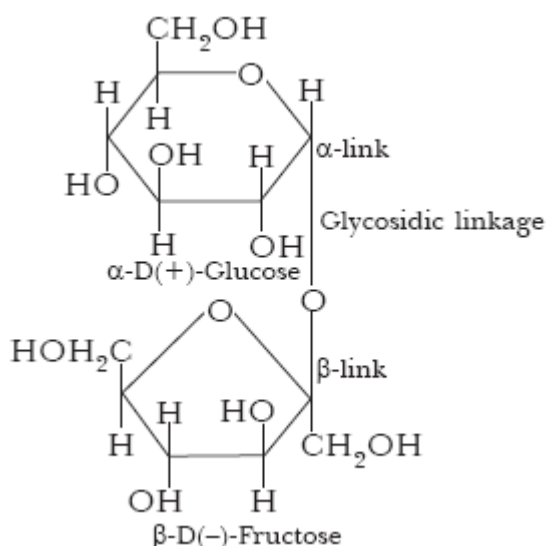
(iii) Deficiency of Vitamin 'C' causes bleeding of gums.

- 46 Define the following, giving one example of each: 3
 (i) Zwitter ion
 (ii) Glycosidic linkage

ANS: (i) The ion whose one end is positively charged and other end is negatively charged is called Zwitter ion, e.g.



(ii) Glycosidic Linkage: The oxide linkage between monosachharide units in oligo and polysaccharide is called glycosidic linkage, e.g.



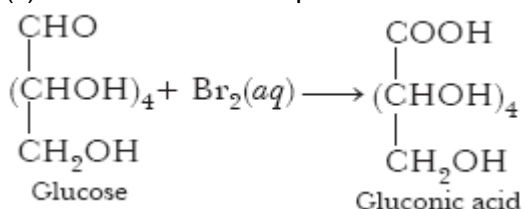
- 47 (i) Deficiency of which vitamin causes night-blindness? 3
 (ii) Name the base that is found in nucleotide of RNA only.

(iii) Glucose on reaction with HI gives n-hexane. What does it suggest about the structure of glucose?

- ANS: (i) Vitamin A
(ii) Uracil is found in RNA only.
(iii) It shows open straight chain structure of glucose.

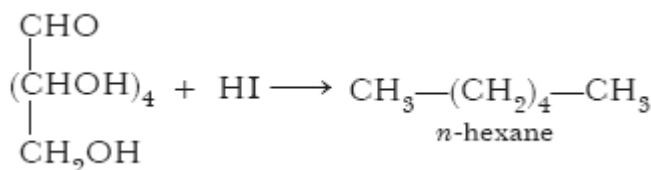
- 48 (i) Deficiency of which vitamin causes rickets?
(ii) Give an example for each of fibrous protein and globular protein.
(iii) Write the product formed on reaction of D-glucose with Br₂ water. 3

- ANS: (i) Deficiency of vitamin 'D' causes rickets.
(ii) Keratin is a fibrous protein and albumin is a globular protein. (iii)



- 49 (i) Deficiency of which vitamin causes scurvy?
(ii) What type of linkage is responsible for the formation of proteins?
(iii) Write the product formed when glucose is treated with HI. 3

- ANS: (i) Vitamin C
(ii) peptide linkage
(iii) n-hexane is formed.



- 50 Define the following terms:
(a) Invert sugar
(b) Vitamins
(c) Nucleoside 3

- ANS: (a) Invert sugar: It is a mixture containing equal amount of glucose and fructose.
(b) Vitamins: Vitamins are the group of organic compounds which are required in very small amounts for the healthy growth and functioning of animal organism. They cannot be made by organism and so have to be part of our diet. The deficiency of a vitamin can cause a specific disease. Vitamins A, D, E and K are fat-soluble substances, whereas vitamin B complex and vitamin C are water-soluble.
(c) Nucleosides: A base joined to a sugar molecule is called *nucleoside*, e.g. adenosine contains adenine and ribose, guanosine contains ribose and guanine, cytidine contains ribose and cytosine.

- 51 Define the following terms as related to proteins:
(i) Peptide linkage
(ii) Primary structure
(iii) Denaturation 3

- ANS: (i) Peptide linkage: Amino acids are joined together by $\text{—}\overset{\text{O}}{\parallel}{\text{C}}\text{—NH}$ bond in proteins and polypeptides. It is called peptide linkage.
(ii) Primary structure: The sequence of amino acids in proteins and polypeptides is called primary structure. It involves peptide bonds.

(iii) Denaturation: When proteins are heated or pH is changed, their tertiary structure is ruptured and it loses biological activity. This process is called denaturation.

52 Define the following terms:

- (i) Glycosidic linkage
- (ii) Invert sugar
- (iii) Oligosaccharides

3

ANS: (i) The oxide linkage between monosaccharides in oligo and poly saccharides is called glycosidic linkage.
(ii) The mixture of glucose and fructose is called invert sugar.
(iii) Those saccharides which give 2 to 10 molecules of monosaccharides on hydrolysis are called oligosaccharides.

53 Define the following terms:

- (i) Nucleotide
- (ii) Anomers
- (iii) Essential amino acids

3

ANS: (i) Nucleotides: These are the monomers of nucleic acid. They consist of heterocyclic base, pentose sugar and phosphoric acid residue.
(ii) Anomers: Those compounds which differ in orientation of —OH group on C-1 carbon atom are called anomers.
(iii) Essential amino acids: Those amino acids which are not synthesised by our body and must be a part of our diet are called essential amino acids.

54 Define the following terms:

- (a) Polysaccharides
- (b) Amino acids
- (c) Enzymes

3

ANS: (a) Polysaccharides: Those carbohydrates which on hydrolysis give large number of monosaccharides are called polysaccharides, e.g. starch.
(b) Amino acids: Those compounds which contain —NH₂ group and —COOH group attached to a carbon are called amino acids. These are the monomers of proteins, e.g. glycine.

55 (i) Which one of the following is a polysaccharide?

Starch, Maltose, Fructose, Glucose

- (ii) What is the difference between nature protein and denatured protein?
- (iii) Write the name of vitamin responsible for coagulation of blood.

3

ANS: (i) Starch
(ii) Native protein has sequence of amino acid having peptide bonds. Denatured protein loses biological activity due to rupture of secondary and tertiary structure.
(iii) Vitamin K.

56 Amino acids contain amino (—NH₂) group and carboxyl (—COOH) group. These are monomers of proteins. Proteins occur in every part of body and form the fundamental basis of structure and functions of life. They are also required for growth and maintenance of body.

- (i) What are essential amino acids? Why should these be part of our diet?
- (ii) What are the chief sources of proteins? Why should children take proteins?
- (iii) Name a disease caused by deficiency of amino acids. What is its cause?
- (iv) What values are possessed by children taking milk, fruits, pulses regularly?

4

ANS: (i) Those amino acids which are not synthesized by our body are called essential amino acids. These must be a part of our diet as these are essential for synthesis of proteins.
(ii) Milk, cheese, pulses, peanuts, fish, meat, soyabean, etc. are the chief sources of proteins. Growing children must take proteins as it is essential for their growth and development.

(iii) Kwashiorkor. It is due to malnutrition in children resulting from the intake of a diet that is excessively carbohydrate but low in proteins and lacks essential amino acids needed for protein synthesis in our body.

(iv) These are good sources of proteins. Milk provides us calcium and vitamin D. These children possess good eating habits to keep themselves healthy.

57 Life is possible due to coordination of various chemical reactions take place in living organisms. All biochemical reactions in our body take place at 37 °C and these reactions are slow. These reactions occur with the help of certain biological catalysts called enzymes. Almost all enzymes are globular proteins. These are highly specific in their action, work at specific pH. 4

(i) Which enzyme converts starch to glucose?

(ii) Which enzyme dissolves blood clots?

(iii) Why are enzymes specific in their actions?

ANS: (i) Diastase converts starch into maltose. Maltase converts maltose into glucose.

(ii) Streptokinase dissolves blood clots.

(iii) It is because a particular substrate can bind with active sites of enzymes.

58 Glucose occurs freely in nature as well as in combined form. It is present in sweet fruits and honey. Ripe grapes also contain glucose in large amount. Glucon-D is instant source of energy. Starch gets hydrolysed into glucose in our body. Glucose is stored in the form of glycogen. 4

(i) What is meant by D in Glucon-D?

(ii) What will happen if we have high amount of glucose in our blood?

(iii) How will you test glucose in urine of diabetic patients? Which property of glucose is used?

(iv) How often people suffering from type I diabetes, should perform test for diabetes? How will it help?

ANS: (i) It contains dextro-rotatory glucose commonly called dextrose.

(ii) It will cause diabetes.

(iii) Add Fehlings' solution A and B or Benedict's reagent in equal amounts. Heat the test tube on water bath. If brick red precipitate is formed, it shows presence of glucose. It is based on reducing property of glucose.

(iv) These people should perform this test regularly so that they can adjust the dose of insulin which they take regularly.

59 RNA and DNA are chiral molecules, their chirality is due to 1

(a) chiral bases (b) chiral phosphate units

(c) D-sugar component (d) L-sugar component

ANS: (c) D-sugar component.

60 Glucose does not react with 1

(a) NH_2OH (b) Conc. HNO_3

(c) $(\text{CH}_3\text{CO})_2\text{O}$ (d) NaHSO_3

ANS: (d) NaHSO_3 does not react with glucose.

61 The glycosidic linkage involved in linking the glucose units in amylose part of starch is (a) $\text{C}_1\text{--C}_4$ β -linkage (b) $\text{C}_1\text{--C}_6$ α -linkage 1

(c) $\text{C}_1\text{--C}_4$ α -linkage (d) $\text{C}_1\text{--C}_6$ β -linkage

ANS: (c) $\text{C}_1\text{--C}_4$ α -linkage are involved in α -glucose, in amylose, linear polymer or α -glucose in starch.

62 A basic amino acid among the following is
(a) glycine (b) valine
(c) histidine (d) leucine 1

ANS: (c) It has two amino groups and one —COOH group.

63 Glucose on oxidation with $\text{Br}_2(\text{aq})$ gives
(a) Gluconic acid (b) Tartaric acid
(c) Sachharic acid (d) Meso-oxalic acid 1

ANS: (a) $\text{Br}_2/\text{H}_2\text{O}$ oxidises —CHO to —COOH.

64 Which of the following is non-reducing sugar?
(a) Glucose (b) Sucrose
(c) Maltose (d) Lactose 1

ANS: (b) Sucrose.

65 Which of the following statements is not correct?
(a) Ovalbumin is a simple food reserve in egg white.
(b) Blood proteins thrombin and fibrinogen are involved in blood clotting.
(c) Denaturation makes the proteins more active.
(d) Insulin maintains sugar level in the blood of a human body. 1

ANS: (c) Denaturation leads to biological activity.

66 Deficiency of vitamin B₁ causes the disease
(a) convulsions (b) beri beri
(c) cheilosis (d) sterility 1

ANS: (b) It is caused by deficiency of water soluble B₁.

67 Which one of the following metals is required as cofactor by all enzymes utilizing ATP in phosphate transfer?
(a) K (b) Ca
(c) He (d) Mg 1

ANS: (d) Mg acts as cofactor.

68 In aqueous solution, an amino acid exist as
(a) cation (b) anion
(c) zwitter ion (d) neutral molecule 1

ANS: (c)
$$\begin{array}{c} \oplus \\ \text{N} \\ | \\ \text{H}_3 \\ | \\ \text{R}-\text{CH}-\text{COO}^- \end{array}$$

69 Glycogen is a branched chain polymer of α -D-glucose units in which chain is formed by C₁—C₄ glycosidic linkage whereas branching occurs by the formation of C₁-C₆ glycosidic linkage. Structure of glycogen is similar to _____. (a) Amylose (b) Amylopectin
(c) Cellulose (d) Glucose 1

ANS: (b) Glycogen is branched chain polymer of α -glucose like amylopectin.

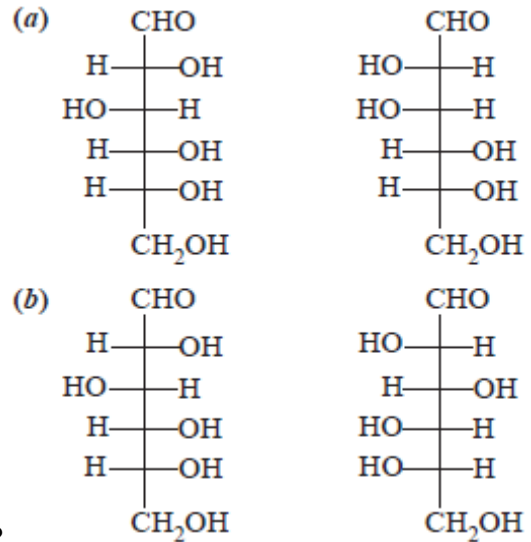
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Which of the following polymer is stored in the liver of animals? (a) Amylose (b) Cellulose (c) Amylopectin (d) Glycogen

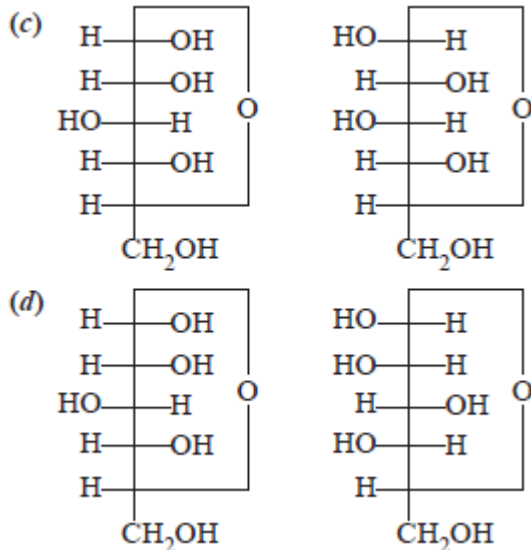
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ANS: (d) Glycogen is stored in liver of animals.

71



Which of the following pairs represents anomers?



ANS: (c) They differ in position of —OH group on C—1 carbon.

72

Proteins are found to have two different types of secondary structures viz. α -helix and β -pleated sheet structure. α -helix structure of protein is stabilised by :

- (a) Peptide bonds
- (b) van der Waals forces
- (c) Hydrogen bonds
- (d) Dipole-dipole interactions

1

ANS: (c) H-bonds are present in α -helix.

73

Which of the following acids is a vitamin?

- (a) Aspartic acid
- (b) Ascorbic acid
- (c) Adipic acid
- (d) Saccharic acid

1

ANS: (b) Ascorbic acid is vitamin C, antioxidant, water soluble and its deficiency causes scurvy.

- 74 Dinucleotide is obtained by joining two nucleotides together by phosphodiester linkage. Between which carbon atoms of pentose sugars of nucleotides are these linkages present? (a) 5' and 3' (b) 1' and 5' (c) 5' and 5' (d) 3' and 3'

ANS: (a) 5' and 3' carbon atoms.

- 75 Nucleic acids are the polymers of _____. (a) Nucleosides (b) Nucleotides (c) Bases (d) Sugars

ANS: (b) Nucleic acids are polymers of nucleotides.

- 76 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 _____. (a) primary structure of proteins. (b) secondary structure of proteins. (c) tertiary structure of proteins. (d) quaternary structure of proteins.

ANS: (a) It is called primary structure having $\text{—}\overset{\text{O}}{\parallel}{\text{C}}\text{—NH—}$ peptide bonds.

- 77 Which of the following B group vitamins can be stored in our body? (a) Vitamin B₁ (b) Vitamin B₂ (c) Vitamin B₆ (d) Vitamin B₁₂

ANS: (d) Vitamin B₁₂ is stored in our body as it is neither water soluble nor fat soluble.

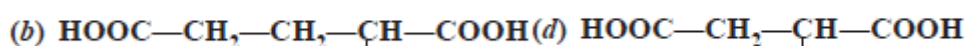
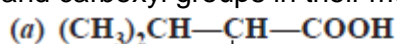
- 78 Which of the following reactions of glucose can be explained only by its cyclic structure? [NCERT Exemplar Problem] (a) Glucose forms pentaacetate. (b) Glucose reacts with hydroxylamine to form an oxime. (c) Pentaacetate of glucose does not react with hydroxylamine. (d) Glucose is oxidised by nitric acid to gluconic acid.

ANS: (c) It means glucose pentaacetate has cyclic structure which does not have free aldehyde group.

- 79 Carbohydrates are classified on the basis of their behaviour on hydrolysis and also as reducing or non-reducing sugar. Sucrose is a _____. (a) monosaccharide (b) disaccharide (c) reducing sugar (d) non-reducing sugar

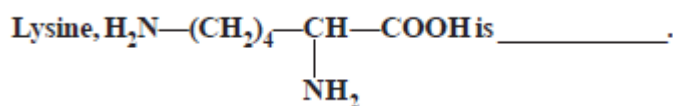
ANS: (b) and (d). It is disaccharide made up of glucose and fructose and does not have free aldehyde group, therefore, non-reducing sugar.

- 80 Amino acids are classified as acidic, basic or neutral depending upon the relative number of amino and carboxyl groups in their molecule. Which of the following are acidic?



ANS: (b) and (d) are acidic amino acids.
∴ they have 2—COOH groups and one —NH₂ group.

81



(a) α-Amino acid

- (b) Basic amino acid
(c) Amino acid synthesised in body
(d) β-Amino acid

ANS: (a) and (b). It is α-amino acid.

∴ —NH₂ and —COOH groups are attached to same carbon. It is basic because it has 2 amino groups and one —COOH group.

82

Match the vitamins given in Column I with the deficiency disease they cause given in Column II.

Column I
(Vitamins)

Column II
(Diseases)

- | | |
|-----------------------------|------------------------------------|
| (a) Vitamin A | (i) Pernicious anaemia |
| (b) Vitamin B ₁ | (ii) Increased blood clotting time |
| (c) Vitamin B ₁₂ | (iii) Xerophthalmia |
| (d) Vitamin C | (iv) Rickets |
| (e) Vitamin D | (v) Muscular weakness |
| (f) Vitamin E | (vi) Night blindness |
| (g) Vitamin K | (vii) Beri Beri |
| | (viii) Bleeding gums |
| | (ix) Osteomalacia |

ANS: (a) (iii) and (vi) (b) (vii) (c) (i)
(d) (viii) (e) (iv) and (i)
(f) (v) (g) (ii)

83

Note: In the following questions a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices. (Q.25 to Q.26)

- (a) Assertion and reason both are correct and reason is correct explanation of assertion.
(b) Assertion and reason both are wrong statements.
(c) Assertion is correct but reason is wrong statement.
(d) Assertion is wrong but reason is correct statement.
(e) Assertion and reason both are correct statements but reason is not correct explanation of assertion.

Assertion: D (+) – Glucose is dextrorotatory in nature.

Reason: 'D' represents its dextrorotatory nature.

ANS: (c) Assertion is correct but reason is wrong statement. 'D' represents configuration, i.e., —OH group on right side on first chiral carbon from the bottom (+) dextrorotatory, it is also denoted by d(+).

84

In the following questions a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices. (Q.25 to Q.26)

- (a) Assertion and reason both are correct and reason is correct explanation of assertion.
 (b) Assertion and reason both are wrong statements.
 (c) Assertion is correct but reason is wrong statement.
 (d) Assertion is wrong but reason is correct statement.
 (e) Assertion and reason both are correct statements but reason is not correct explanation of assertion. Assertion: Vitamin D can be stored in our body.
 Reason: Vitamin D is fat soluble vitamin.

ANS: (a) Assertion and reason both are correct and reason is correct explanation of assertion.

85 Guanine and adenine belong to _____ and Thymine and Uracil are _____ bases. 1

ANS: purines, pyrimidines

86 Enzymes are _____ proteins. 1

ANS: globular

87 Cellulose is linear polymer of _____. 1

ANS: β -glucose.

88 Invert sugar is mixture of glucose and fructose and is leavorotatory. [True/False] 1

ANS: True

89 Amylose is linear water soluble, amylopectin is water insoluble, branch chain polymer of α -glucose are two components of starch. [True/False] 1

ANS: True

90 During denaturation of proteins, tertiary and secondary structure are ruptured but primary structure remains the same. [True/False] 1

ANS: True

91 Thiol group is present in
 (a) cytosine (b) cystine
 (c) cysteine (d) methionine 1

ANS: (c) Cysteine contains —SH group.

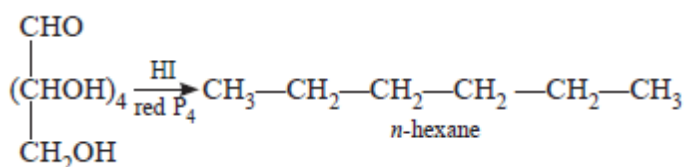
92 The change in optical rotation of freshly prepared solution of glucose is known as
 (a) racemisation (b) specific rotation
 (c) mutarotation (d) tautomerism 1

ANS: (c) It is called mutarotaion because α -glucose change to β -glucose and vice-versa.

- 93 Which of the following statement is correct?
 (a) All amino acids are optically active.
 (b) All amino acids except glycine are optically active. 1
 (c) All amino acids except glutamic acid are optically active.
 (d) All amino acids except lysine are optically active.

ANS: (b) $\text{H}_2\text{N}-\text{CH}_2-\text{COOH}$ (glycine) is not optically active due to absence of chiral 'C'.

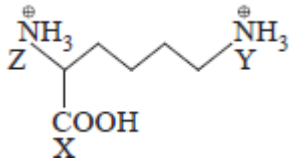
- 94 Glucose, when reduced with HI and red phosphorus gives
 (a) n-hexane (b) n-heptane 1
 (c) n-pentane (d) n-octane



ANS: (a)

- 95 How many amino acids are present in insulin?
 (a) 21 (b) 51 1
 (c) 20 (d) 52

ANS: (b) There are 51 amino acids present in insulin.

- 96  The increasing acid strength is
 (a) $X > Z > Y$ (b) $Z < X < Y$
 (c) $X > Y > Z$ (d) $Z > X > Y$ 1

ANS: (c) \because $-\text{COOH}$ (X) is most acidic, 'Z' is less than 'Y' due to $-\text{COOH}$ group which is electron withdrawing.

- 97 Which of the following is correct about H-bonding in DNA?
 (a) A – T, G – C (b) A – G, T – G 1
 (c) G – T, A – C (d) A – A, T – T

ANS: (a) A forms H-bond with T and vice versa. G forms H-bonds with C and vice versa, that is why two strands of DNA are not identical but complementary.

- 98 ADP and ATP differ in number of
 (a) phosphate units (b) ribose units 1
 (c) adenine units (d) nitrogen atoms

ANS: (a) ADP is adenosine diphosphate and ATP is adenosine triphosphate.

- 99 The α - and β -glucose are
 (a) isomers of D(+) glucose and L(–) glucose respectively. 1
 (b) diastereomers of glucose
 (c) anomers of glucose
 (d) isomers which differ in the configuration of C-2.

ANS: (c) They differ in position of —OH group on C-1 carbon.

- 100 Which of the following proteins is globular?
(a) Collagen (b) Albumin
(c) Myosin (d) Fibroin 1

ANS: (b) Albumin is globular protein, others are fibrous proteins.

- 101 Which of the following monosaccharides are present as five membered cyclic structure (furanose structure)? (a) Ribose (b) Glucose
(c) Fructose (d) Galactose 1

ANS: (a) Ribose and (c) Fructose have five membered furanose structure.

- 102 In fibrous proteins, polypeptide chains are held together by _____. [NCERT Exemplar Problem]
(a) van der Waals forces
(b) disulphide linkage
(c) electrostatic forces of attraction
(d) hydrogen bonds 1

ANS: (b) and (d), H-bonds and disulphide linkages are present between polypeptide chains.

- 103 Match the following enzymes given in Column I with the reactions they catalyse given in Column II.

Column I
(Enzymes)

Column II
(Reactions)

- (a) Invertase (i) Decomposition of urea into NH_3 and CO_2
(b) Maltase (ii) Conversion of glucose into ethyl alcohol
(c) Pepsin (iii) Hydrolysis of maltose into glucose
(d) Urease (iv) Hydrolysis of cane sugar
(e) Zymase (v) Hydrolysis of proteins into peptides

ANS: (a) (iv) (b) (iii) (c) (v) (d) (i) (e) (ii)

- 104 In the following question a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices.
(a) Assertion and reason both are correct and reason is correct explanation of assertion.
(b) Assertion and reason both are wrong statements.
(c) Assertion is correct statement but reason is wrong statement.
(d) Assertion is wrong statement but reason is correct statement.
(e) Both assertion and reason are correct statements but reason is not correct explanation of assertion. 1

Assertion: Glycine must be taken through diet.

Reason: It is an essential amino acid.

ANS: (b) Both assertion and reason are wrong statements. Glycine is not essential amino acid because it is produced in our body, so it may not be part of our diet.

- 105 Proteins are polypeptides having molecular weight more than _____. 1
- ANS: 10000.
- 106 Three types of RNA are _____, _____, _____. 1
- ANS: m-RNA (Messenger RNA), t-RNA (Transfer RNA), r-RNA (Ribosomal RNA).
- 107 Enzymes are highly specific in action, work at specific pH and optimum temperature (37°C) in our body. [True/False] 1
- ANS: True.
- 108 α -Amino acids have lower melting point than α -halo acids. [True/False] 1
- ANS: False, α -Amino acids exist as zwitter ion, forming internal salt, soluble in water, have melting point higher than α -halo acids.