CHEMISTRY

BOOKS - MTG CHEMISTRY (ENGLISH)

BIOMOLECULES

Mcqs

1. The general formula of carbohydrate is

A. $C_nH_{2n+1}O$

B. $C_nH_{2n}O$

C. $C_n(H_2O)_n$

D. $C_n(H_2O)_{2n}$

Answer: C

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2. Which of the following compounds is found abundantly in nature?

A. Fructose

B. Starch

C. Glucose

D. Cellulose

Answer: D

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3. Cellulose is a protein.

A. hexapolysaccharide

B. pentapolysaccharide

C. tripolysaccharide

D. none of these

Answer: D

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4. Which of the following is non-reducing sugar ?

A. Glucose

B. Sucrose

C. Maltose

D. Lactose

Answer: B

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5. Which of the following is an example of aldopentose

A. D-Ribose

B. Glyceraldehyde

C. Fructose

D. Erythrose

Answer: A

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6. Match the sugars in columns I with their types given in column II and mark the appropriate choice.

Column I		Column II	
(A)	Glucose	(i)	Ketohexose
(B)	Fructose	(ii)	Aldohexose
(C)	Ribose	(iii)	Aldotetrose
(D)	Erythrose	(iv)	Aldopentose

A. $(A) \rightarrow (iv), (B) \rightarrow (i), (C) \rightarrow (iii), (D) \rightarrow (ii)$

B. $(A) \rightarrow (iii), (B) \rightarrow (iv), (C) \rightarrow (i), (D) \rightarrow (ii)$

C. $(A) \rightarrow (i), (B) \rightarrow (ii), (C) \rightarrow (iii), (D) \rightarrow (iv)$

D. $(A) \rightarrow (ii), (B) \rightarrow (i), (C) \rightarrow (iv), (D) \rightarrow (iii)$

Answer: D

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7. Which of the following treatment will convert starch directly into glucose ?

A. Heating with dilute H_2SO_4

B. Fermentation by diastase

C. Fermentation by zymase

D. Heating with dilute NaOH

Answer: A

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8. Glucose $\xrightarrow{\text{HCN}} \xrightarrow{\text{hydrolysis}} \xrightarrow{\text{HI heat}} A$,A is :

A. 2-Iodoheptane

B. Heptane-2-ol

C. 2-Iodohexane

D. Heptanoic acid

Answer: D

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9. Aniline reacts with excess Br_2 / H_2O to give the major product

A. 1. 2-bromoaniline

B. 2. 4-bromoaniline

C. 3. 2,4-dibromoaniline

D. 4. 2,4,6-tribromoaniline

Answer: C

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10. Glucose reacts with acetic anhydride to form

A. 3

B. 5

C. 4

D. 1

Answer: B

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11. The letter D in D-glucose signifies.

A. dextrorotatory

B. configuration

C. diamagnetic nature

D. mode of synthesis

Answer: B

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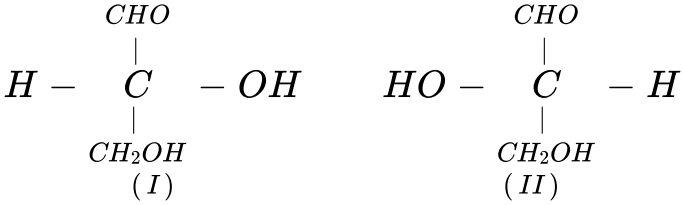
12. The given structures (I) and (II) represent configuration of the simplest sugar glyceraldehyde . Which of the following statements is not correct for the structures ?



A. (I) represents D-form while (II) represents L-form of glyceraldehyde .

B. The sugars having same configuration as D-glyceraldehyde are designated as D-sugars.

C. Natural glucose and fructose are D-Sugars.

D. D is dextrorotatory while L is laevorotatory enantiomer.

Answer: D

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13. Pick up the incorrrect statement from the following.

A. Glucose exists in two different crystalline forms , $\alpha -$ D-glucose and $\beta - D$- glucose

B. Cyclic structure of $\alpha - D -$ glucose and $\beta -$ D-glucose is called pyranose structure.

C. $\alpha -$ D-glucose and $\beta -$ D-glucose are enantiomers.

D. Cellulose is a straight chain polysaccharide made up of only β-glucose units.

Answer: C

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14. Which of the following carbon is anomeric in glucose

A. C-1 carbon

B. C-2 carbon

C. C-5 carbon

D. C-6 carbon

Answer: A

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15. A diabetic person carries a packet of glucose with him always because

A. a. glucose increases the blood sugar level slowly.

B. b. glucose reduces the blood sugar level

C. c. glucose increases the blood sugar level almost instantaneously

D. d.glucose reduce the blood sugar level slowly.

Answer: C

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16. What is the essential difference between α - and - β - forms of glucose ?

A. isomers of D(+) glucose and L(-) glucose respectively

B. diastereomers of glucose

C. anomers of glucose

D. isomers which differ in the configuration of C-2

Answer: C

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17. How many atoms are there in pyaranose ring ?

A. 3

B. 5

C. 6

D. 7

Answer: C

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18. Among the naturally occuring carbohydrates, furanose ring is found in the

A. glucose unit of cane sugar

B. glucose unit of cellulose

C. fructose unit of cane sugar

D. galactose unit of lactose.

Answer: C

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19. Which one of the following sets of monosaccharides forms sucrose ?

A. α-D- galactopyranose and α-D-glucophyranose

B. α-D-glucopyranose and β-D-fructofuranose

C. α-D-glucopyranose and β-D-fructopyranose

D. α-glucopyranose and β-D-fructopyranose

Answer: B

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20. What are the hydrolysis products of sucrose ?

A. Fructose+Fructose

B. Glucose + Glucose

C. Glucose +Galactose

D. Glucose+Fructose

Answer: D

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21. Glycosidic linkage is :

A. amide linkage

B. ester linkage

C. ether linkage

D. acetyl linkage.

Answer: C

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22. Invert sugar is mixture of

A. a type of cane sugar

B. optically inactive form of sugar

C. mixture of glucose and galactose

D. mixture of glucose and fructose in equimolar quantities

Answer: D

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23. Which of the following statements is not true ?

A. Glucose and fructose both are monosaccharides

B. The natural glucose and fructose are D-forms.

C. The solution having equal molecules of D-glucose and D-fructose is termed as invert sugar.

D. Aldohexoses exist in 2^6 optical forms

Answer: D

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24. Maltose is made up of :

A. two α-D-glucose

B. normal $\beta - D$-glucose

C. α-and $\beta - D$-glucose

D. fructose

Answer: A

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25. Which one of the following is not correct ?

A. D(-) Fructose exists in furanose structure

B. D(+) Glucose exists in pyranose structure.

C. In sucrose the two monosaccharides are held together by peptide linkage

D. Maltose is a reducing sugar.

Answer: C

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26. Which one of the following statements is not true regarding $(+)$ Lactose ?

A. On hydrolysis , (+)lactose gives equal amount of D(+) glucose and D(+) galactose .

B. (+) Lactose is a β-glucoside formed by the union of a molecule of D(+) glucose and a molecule of D(+) galactose.

C. (+) Lactose is a reducing sugar and does not exhibit mutarotation .

D. (+) Lactose ,$C_{12}H_{22}O_{11}$ contains 8-OH groups.

Answer: C

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27. Glycosidic linkage in maltose/amylose is

A. $C_1 - C_4$ β linkage

B. $C_1 - C_6\beta$ linkage

C. $C_1 - C_6\alpha$ -linkage

D. $C_1 - C_4\alpha -$ linkage

Answer: D

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28. The chemical formula of starch is

A. 1. $(C_6H_{12}O_6)_n$

B. 2. $(C_6H_{10}O_5)_n$

C. 3. $C_{12}H_{22}O_{11}$

D. 4. $(C_6H_{12}O_4)_n$

Answer: B

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29. Cellulose, starch and glycogen are all the polysaccharides which contain:

A. amylopectin and glycogen

B. amylose and glycogen

C. amylose and amylopectin

D. cellulose and glycogen

Answer: C

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30. In cellulose, D-glycosidic units are joined by

A. α-1,4 glycosidic linkage

B. β-1,6 glycosidic linkage

C. β-1,4 glycosidic linkage

D. peptide linkage

Answer: C

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31. Cellulose in the form of plants is a food for cattles and sheeps but not for human beings. Explain.

A. human body does not contain cellulase hence cellulose cannot be broken into D-glucose

B. human saliva cannot break down plant cellulose in small pieces

C. bile juice present in cattle helps them to digest cellulose

D. human beings have a smaller stomach than cattle.

Answer: A

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32. Carbohydrates are stored in human body as the polysaccharide:

A. starch

B. glycogen

C. cellulose

D. amylose

Answer: B

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33. A compound which contains both ..... And .....is called amino acid. The amino acids in polypeptide chain are joined by .....bonds.

A. amino, carboxylic , group , ester

B. amino, carboxylic group, peptide.

C. nitrogen , carbon , glycosidic

D. hydroxy, carboxylic group, peptide.

Answer: B

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34. Which of the following statements about amino acids is false

A. They are constituents of all proteins

B. Alanine having one amino and one carboxylic group.

C. Most naturally occuring amino acids have D-configuration.

D. Glycine is the only naturally occuring amino acid which is optically inactive.

Answer: C

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35. One of the different amino acids which can be synthesised in the body is:

A. Alanine

B. Lysine

C. Valine

D. Histidine

Answer: A

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36. The α-amino acid which contains the aromatic side chain is:

A. proline

B. tyrosine

C. valine

D. serine

Answer: B

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37. The number of amino acids found in proteins that a human body can synthesize is

A. 20

B. 25

C. 10

D. 100

Answer: A

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38. Which of the following is a basic amino acid ?

A. Lysine

B. proline

C. Alanine

D. Aspartic acid

Answer: A

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39. which of the following is acidic amino acid?

A. Glycine

B. Valine

C. Leucine

D. Glutamic acid

Answer: D

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

(i)$(CH_3)_2OH - \underset{\underset{NH_2}{|}}{C}\ H - COOH$

(ii)$HOOC - CH_2 - CH_2 - \underset{\underset{NH_2}{|}}{C}\ H - COOH$

(iii) $H_2N - CH_2 - CH_2 - CH_2 - COOH$

(iv)$HOOC - CH_2 - \underset{\underset{NH_2}{|}}{C}\ H - COOH$

A. (ii) and (iv)

B. (iii) and (iv)

C. (i)nad (ii)

D. (ii) and (iii)

Answer: A

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41. Amino acids usually exist in the form of Zwitter ions. This mean that they consist of

A. basic-NH_2 group and acidic -COOH group

B. the basic -$\overset{+}{N}H_3$ group and acidic $-COO^-$ group

C. basic $-NH_2$ and acidic $-H^+$ group

D. basic $-COO^-$ group and acidic -$\overset{+}{N}H_3$ groups

Answer: D

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42. Which compound can exist in a dipolar (zwitter ion) state

A. $C_6H_5CH_2CH(N=CH_2)COOH$

B. $(CH_3)_2CHCH(NH_2)COOH$

C. $C_6H_5CONHCH_2COOH$

D. $HOOCCH_2CH_2COCOOH$

Answer: B

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43. Which of the following statements is not correct ?

A. Only α-amino acids are obtained on hydrolysis of proteins

B. The amino acids which are synthesised in the body are known as non-essential amino acids.

C. There are 20 essential amino acids.

D. L-amino acids are represented by writing the $-NH_2$ group on the left side.

Answer: C

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44. The melting points and solubility in water of amino acids are generally higher than that of the corresponding halo acids. Explain.

A. amino acids exist as zwitter ions resulting in strong dipole-dipole attraction

B. amino acids are optically active

C. due to higher molecular mass of -NH_2 group molecular mass of amino acids is higher

D. they interact with water more than halo-acids and have salt like structure .

Answer: A

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45. Which of the following polymers are condensation polymes?

A. a. α-amino acids

B. b. β-amino acids

C. c. α-hydroxy acids

D. d. β-hydroxy acids.

Answer: A

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46. Which of the following statements is not correct ?

A. Proteins are polyamides formed from amino acids.

B. Except glycine, all other amino acids show optical activity.

C. Natural proteins are commonly made up of L-isomer of amino acids.

D. In α-amino acids, $-NH_2$ and $-COOH$ groups are attached to different carbon atoms.

Answer: D

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47. Which of the following represents a peptide chain ?

A. $-NH-\underset{\underset{O}{\|}}{C}-NH-\overset{\overset{|}{}}{\underset{|}{C}}-NH-\underset{\underset{O}{\|}}{C}-NH-$

B.

$-NH-\underset{\underset{O}{\|}}{C}-CH_2-CH_2CH_2-NH-CH_2CH_2-\underset{\underset{O}{\|}}{C}-$

C.

$-NH-CH_2-\underset{\underset{O}{\|}}{C}-NH-CH_2-\underset{\underset{O}{\|}}{C}-NH-CH_2-$

D. $-NH-CH_2CH_2-\underset{\underset{O}{\|}}{C}-NH-CH_2-\underset{\underset{O}{\|}}{C}-CH_2-$

Answer: C

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48. Which of the following is the correct statement ?

A. Starch is a polymer of α-glucose

B. Amylose is not a component of starch

C. Proteins are composed of only one type of amino acid.

D. In cyclic structure of fructose, there are five carbon and one oxygen atoms.

Answer: A

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49. The peptide linkage formed between glycine (NH_2CH_2COOH) and alanine $\underset{\underset{CH_3}{|}}{NH_2CH}-COOH$ to give glycylalanine can be shown as

A. $NH_2-CH_2-NH-\underset{\underset{CH_3}{|}}{C}H-COOH$

B. $NH_2-CH_2-CONH-\underset{\underset{CH_3}{|}}{C}H-COOH$

C. $H_2NCOCH_2-\underset{\underset{CH_3}{|}}{C}H-CONH_2$

D. $HOOC-CH_2-NH-NH-\underset{\underset{CH_3}{|}}{C}H-COOH$

Answer: B

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50. In fibrous proteins, polypeptide chains are held together by..... .

A. a.van der Waals forces

B. b.electrostatic forces of attraction

C. c.hydrogen bonds

D. d.covalent bonds.

Answer: C

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51. Keratin is a protein having larger amount of

A. hair

B. wool

C. silk

D. all of these

Answer: D

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52. Globular proteins are present in:

A. blood

B. eggs

C. milk

D. all of these

Answer: D

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53. Mark the incorrect example.

A. Keratin and myosin-Fibrous proteins

B. Insulin and albumins -Globular proteins

C. Glycylalanine-Dipeptide

D. Enzymes and haemoglobin -Derived proteins

Answer: D

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54. Primary structure of protein is due to

A. sequence in which α-amino acids are linked to one another

B. sequence in which amino acid of one polypeptide chain are joined to other chain

C. the folding patterns of polypeptide chains

D. the pattern in which the polypeptide chains are arranged.

Answer: A

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55. Secondary structure of proteins refers to

A. sequence of amino acids in polypeptide chain

B. bonds between alternate polypeptide chains

C. folding patterns of polypeptide chain

D. bonding between NH_3^+ and COO^- of two peptides.

Answer: C

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56. Most common types of secondary structures of proteins are

:

A. α-helix and $\beta -$ helix structures

B. α-helix and β-pleated sheet structures

C. right and left hand twisted structures

D. globular and fibrous structures

Answer: B

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57. $\alpha -$ helix is a secondary structure of proteins formed by twisting of polypeptide chain into right handed screw like structure. Which type of interactions are responsible for making the α-helix structure stable?

A. Petpide bonds between $-NH_2$ and $-CO$ groups of adjacent carbon chains.

B. Hydrogen bonds between -NH of amino acid in one turn with -CO of amino acid to adjacent turn.

C. $-OH$ group of one amino acid with -CO group of other amino acid on the turn.

D. Hydrogen bonds between adjacent amino acids.

Answer: B

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58. Which of the following statements is true for proteins ?

A. They act as antibodies

B. They act as hormones.

C. They catalyse the biochemical reactions.

D. all of these

Answer: D

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59. Denaturation of proteins leads to loss of its biological activity by

A. formation of amino acids

B. loss of primary structure

C. loss of both primary and secondary structure

D. loss of both secondary and tertiary structure

Answer: D

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60. Mark the wrong statement about denaturation of proteins.

A. The primary structure of the protein does not change.

B. Globular proteins are converted into fibrous proteins

C. Fibrous proteins are converted into globular proteins

D. The biological activity of the protein is destroyed.

Answer: C

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61. Which of the following is not a function of proteins?

A. Fomation of hair, wool , skin and nails.

B. As a biological catalyst in the form of enzymes.

C. As food in the form of meat, eggs.

D. As energy provider for metabolism

Answer: D

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62. On boiling the egg, what structural changes are taking place in the egg white ?

A. The colour of the egg changes from colourless to white.

B. 2° and 3° structures are destroyed but 1° structure remains intact.

C. $1^\circ, 2^\circ$ and 3° structures of egg are destroyed.

D. A reversible change takes place which can be reversed by decreasing the temperature .

Answer: B

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63. Enzymes are made up of

A. edible proteins

B. proteins with specific structure

C. nitrogen containing carbohydrates

D. carbohydrates.

Answer: B

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64. the conversion of maltose to glucose is possible by the enzyme :

A. zymase

B. lactase

C. maltose

D. diastase.

Answer: C

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65. Which of the following is a fat soluble vitamin

A. Vitamin A

B. Vitamin B_6

C. Vitamin C

D. Vitamin B_2

Answer: A

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66. Vitamin B_2 is :

A. ascorbic acid

B. riboflavin

C. thiamine

D. pyridoxine.

Answer: B

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67. Which of the following vitamins is water soluble

A. Vitamin E

B. Vitamin D

C. Riboflavin

D. Retinol

Answer: C

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68. Vitamin A is present in

A. fish liver oil

B. milk

C. butter

D. all of these

Answer: D

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69. Vegetable oils like wheat germ oil, sunflower oil etc. are the good source of

A. vitamin K

B. vitamin E

C. vitamin D

D. vitamin A

Answer: B

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70. Why must vitamin C be supplied regularly in diet?

A. it is water soluble hence excreted in urine and can't be stored in the body

B. it is fat soluble hence stored in the body and cannot be used on regular basis

C. it is required in a large amount by the body hence supplied regularly

D. it is water soluble hence used by the body on daily basic and it to be supplied regularly.

Answer: A

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71. Deficiency of vitamin E causes

A. rickets

B. scurvy

C. muscular weakness

D. beri beri

Answer: C

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72. Which of the following diseases is not correctly matched with the vitamins mentioned with it ?

A. Vitamin B_2-Cracking of lips

B. Vitamin C-Bone deformities

C. Vitamin D-Osteomalacia

D. Vitamin A-Night blindness

Answer: B

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73. Characters are transferred from parents to offspring through :

A. gametes

B. genes

C. mutants

D. enzymes

Answer: B

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74. Nucleic acids are made of

A. small molecules

B. dipeptides

C. long chain polymers of nucleotides

D. polypeptides

Answer: C

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75. The human body does not produce:-

A. Enzyme

B. Vitamins

C. Proteins

D. Nucleic acid

Answer: B

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76. A nucleoside on hydrolysis gives

A. an aldopentose and a nitrogenous base

B. an aldopentose and phosphoric acid

C. an aldopentose, a nitrogenous base and phosphoric and

D. a nitrogenous base and phosphoric acid

Answer: A

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77. Thymine is

A. 5-methyluracil

B. 4-methyluracil

C. 3-methyluracil

D. 1-methyluracil

Answer: A

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78. Guanine is an example of

A. a nitrogenous base

B. a nucleoside

C. a nucleotide

D. phosphate

Answer: A

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79. Bases common to RNA and DNA are

A. adenine, guanine, cytosine

B. adenine , uracil, cytosine

C. adenine, guanine, thymine

D. guanine, uracil, thymine.

Answer: A

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80. In DNA, the complimentary bases are

A. uracil and adenine, cytosine , cytosine and guanine

B. adenine and thymine , guanine and cytosine

C. adenine and thymine, guanine and uracil

D. adenine and guanine , thymine and cytosine

Answer: B

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81. Which of the following base is not present in DNA ?

A. Thymine

B. Quinoline

C. Adenine

D. Cytosine

Answer: B

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82. A base sugar phosphate' unit in nucleic acid is known as

A. nucleotide

B. nucleoside

C. phosphotide

D. polypeptide

Answer: A

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83. RNA is

A. single helix strand

B. double helix strand

C. right hand twisted double helix strand

D. triple helix strand

Answer: A

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84. If one strand of DNA has the sequence ATGCTTGA, the sequence in the complimentary strand would be

A. TCCGAACT

B. TACGTAGT

C. TACGAATC

D. TACGAACT

Answer: D

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85. Differentiate between RNA and DNA ?

A. ribose sugar and thymine in RNA

B. deoxyribose sugar and uracil in DNA

C. ribose sugar and uracil in RNA

D. deoxyribose sugar and guanine in DNA

Answer: C

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86. The double helix model of DNA was proposed by

A. 1. Har Gobind Khorana

B. 2. Watson and Crick

C. 3. A.R. Todd

D. 4. G.W. kenner

Answer: B

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87. When adenine is attached to ribose sugar, it is called adenosine . To make a nucleotide from it, would require

A. oxygenation

B. addition of a base

C. addition of phosphate

D. hydrogenation

Answer: C

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88. The hormone thyroxine

A. a. is secreted by pancreas

B. b. is secreted by thyroid

C. c. decreases blood sugar

D. d. does not stimulate metabolism

Answer: B

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89. Hyperglycemia implies

A. high blood-sugar level

B. low blood-sugar level

C. high concentration of salt in blood

D. low concentration of salt in blood.

Answer: A

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90. Glucocorticoids are produced by

A. a. control the carbohyrates metabolism

B. b. modulate inflammatory reactions

C. c. are involved in the reactions to stress

D. d. all of these

Answer: D

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91. Which of the following is responsible for preparing the uterus for implantation of fertilised egg ?

A. Testosterone

B. Glucocorticoids

C. Progesterone

D. Estradiol

Answer: C

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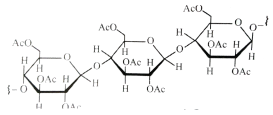
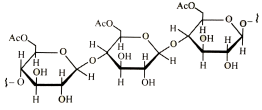
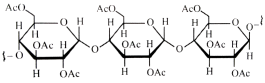
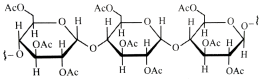
Hots

1. Cellulose upon acetylation with excess acetic anhydride/ H_2SO_4 (catalytic) gives cellulose triacetate whose structure is

A. 

B. 

C. 

D. 

Answer: A

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2. During the process of digestion, the proteins present in food materials are hydrolysed to amino acids. The two enzymes involved in the process are:

$$\xrightarrow{\text{Enzyme (A)}} \text{Polypeptides}$$

$$\xrightarrow[\text{Enzyme (B)}]{} \text{Amino acids}$$

A. invertase and zymase

B. amylase and maltase

C. diastase and lipase

D. pepsin and trypsin

Answer: D

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3. Within the list shown below, the correct pair of structures of alanine in pH ranges 2-4 and 9-11 is

I. $H_3N^+CH(CH_3)CO_2H$

II. $H_2NCH(CH_3)CO_2^-$

III. $H_3N^+CH(CH_3)CO_2^-$

IV. $H_2NCH(CH_3)CO_2H$

A. I,II

B. I,III

C. II, III

D. III,IV

Answer: A

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4. In aqueous solution amino acids moslty exit as

A. $NH_2 - CHR - COOH$

B. $NH_2 - CHR - COO^-$

C. $\overset{+}{N}H_3CHRCOOH$

D. $H_3\overset{+}{N}CHRCOO^-$

Answer: D

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5. Amino acids are least soluble

A. at pH around 7

B. at pH 7

C. at their isoelectric points

D. none of these

Answer: C

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Exempler Problems

1. Glycogen is a branched chain polymer of $\alpha - D$ glucose units in which chain is formed by $Cl - C4$ glycosidic linkage where as branching occurs by the formation of $C1 - C6$ glycosidic linkage. Structure of glycogen is similar to .... .

A. amylose

B. amylopectin

C. cellulose

D. glucose

Answer: B

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2. Which of the following polymer is stored in the liver of animals ?

A. Amylose

B. Cellulose

C. Amylopectin

D. Glycogen

Answer: D

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3. Sucrose (cane sugar) is a disaccharide. One molecule of sucrose on hydrolysis gives..... .

A. 2 molecules of glucose

B. 2 molecules of glucose +1 molecule of fructose

C. 1 molecules of glucose +1 molecule of fructose

D. 2 molecules of fructose

Answer: C

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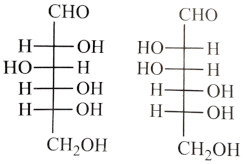
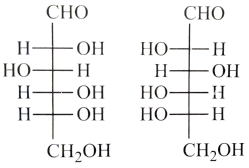
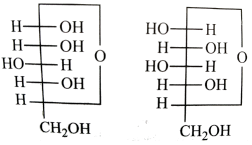
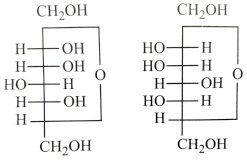
4. Which of the following pairs represents anomers ?

A. 

B. 

C. 

D. 

Answer: C

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5. 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

Answer: C

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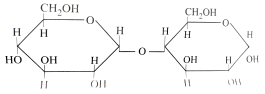
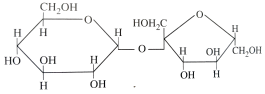
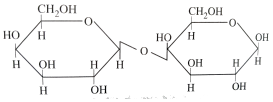
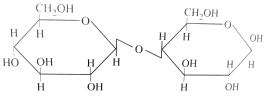
6. In disaccharides, if the reducing groups of monosaccharides, i.e., aldehydic or ketonic groups are bonded, these are non-reducing sugars. Which of the following disaccharide is a non-reducing sugar?

A. 

B. 

C. 

D. 

Answer: B

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7. Which of the following acids is a vitamin?

A. Aspartic acid

B. Ascorbic acid

C. Adipic acid

D. Saccharic acid

Answer: B

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8. 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'

Answer: A

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9. Nucleic acids are the polymers of

A. nucleosides

B. nucleotides

C. bases

D. sugars

Answer: B

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10. Which of the following statements is not true about glucose?

A. It is an aldohexose.

B. On heating with HI it forms n-hexane

C. It is present in furanose form.

D. It does not give 2,4-DNP test.

Answer: C

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11. 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

Answer: A

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12. DNA and RNA contain four bases each. Which of the following bases in not present in RNA?

A. Adenine

B. Uracil

C. Thymine

D. Cytosine

Answer: C

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13. Which of the following B group vitamins can be stored in our body?

A. Vitamin B_1

B. Vitamin B_2

C. Vitamin B_6

D. Vitamin B_{12}

Answer: D

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14. Which of the following bases is not present in DNA

A. Adenine

B. thymine

C. Cytosine

D. Uracil

Answer: D

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15. Which of the following reactions of glucose can be explained only by its cyclic structure?

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.

Answer: C

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16. Structure of a disaccharide formed by glucose and fructose is given below. Identify anomeric carbon atoms in monosaccharide units.

A. $'a'$ carbon of glucose and 'a' carbon of fructose

B. $'a'$ carbon of glucose and 'e' carbon of fructose

C. $'a'$ carbon of glucose and 'b' carbon of fructose

D. $'f'$ carbon of glucose and $'f'$ carbon of fructose.

Answer: C

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Assertion Reason

1. Assertion : Polysaccharides are called non-sugars.

Reason : Carbohydrates which yield a large number of monosaccharide units on hydrolysis are called polysaccharides.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: B

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2. Assertion : Maltose and lactose are examples of reducing sugars.

Reason : Maltose and lactose reduce Fehling's solution and Tollens' reagent.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A

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3. Assertion : Glucose gets oxidised to gluconic acid on reaction with mild oxidising agent like bromine water.

Reason : Glucose contains a keto group.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: C

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4. Assertion : Glucose is correctly named as D-(+)-glucose. ' 3

Reason : 'D' before the name of glucose represents its dextrorotatory nature.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: C

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5. Assertion : D-glucose is dextrorotatory whereas L-glucose is laevorotatory.

Reason : D-compounds are always dextro and L-compounds are always laevorotatory

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: C

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6. Assertion : Glucose reacts with phenyl hydrazine and Fehling's solution but not with $NaHSO_3$.

Reason : $NaHSO_3$ cannot break the ring structure.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: D

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7. The two cyclic hemiacetal forms of glucose differing only in the configuration of the hydroxyl group at C-1 are called

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A

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8. Assertion: Sucrose is a non reducing sugar.

Reason : Sucrose is a disaccharide formed by glycosidic linkage between C-1 of α-glucose and C-2 of β-fructose.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A

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9. Assertion: Hydrolysis of sucrose brings about a change in sign of rotation from dextro to laevo.

Reason: Hydrolysis always changes the optical rotation of a compound.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: C

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10. Assertion: All naturally occuring α-amino acids are optically active

Reason: Most naturally occuring amino acids have D-configuration.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: D

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11. Assertion: All enzymes found in cells are invariably proteins which catalyse biological reactions.

Reason : Enzymes act efficiently at a moderate temperature and pH.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: B

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12. Assertion (A) In presence of enzyme, substrate molecule can be attacked by the reagent effectively.

Reason (R) Active sites of enzymes hold the substrate molecule in a suitable position.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A

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13. Assertion: Vitamin D cannot be stored in our body.

Reason : Vitamin D is fat soluble vitamin and is excreted out of the body with urine.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: D

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14. Assertion: Purine bases present in DNA are adenine and guanine.

Reason: The base thymine is present in RNA while base uracil is present in DNA.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: C

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15. Assertion: The two strands of DNA are complementary to each other

Reason: Adenine specifically forms hydrogen bonds with guanine whereas cytosine forms hydrogen bonds with thymine.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: C

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Carbohydrates

1. The general formula of carbohydrate is

A. $C_nH_{2n+1}O$

B. $C_nH_{2n}O$

C. $C_n(H_2O)_n$

D. $C_n(H_2O)_{2n}$

Answer: C

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2. Which of the following compounds is found abundantly in nature?

A. Fructose

B. Starch

C. Glucose

D. Cellulose

Answer: D

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3. Cellulose is a protein.

A. hexapolysaccharide

B. pentapolysaccharide

C. tripolysaccharide

D. none of these

Answer: D

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4. Which of the following is non-reducing sugar ?

A. Glucose

B. Sucrose

C. Maltose

D. Lactose

Answer: B

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5. Which of the following is an example of aldopentose

A. D-Ribose

B. Glyceraldehyde

C. Fructose

D. Erythrose

Answer: A

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6. Which of the following treatment will convert starch directly into glucose ?

A. Heating with dilute H_2SO_4

B. Fermentation by diastase

C. Fermentation by zymase

D. Heating with dilute NaOH

Answer: A

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7. Glucose $\xrightarrow{\text{HCN}} \xrightarrow{\text{hydrolysis}} \xrightarrow{\text{HI heat}} A$,A is :

A. 2-Iodoheptane

B. Heptane-2-ol

C. 2-Iodohexane

D. Heptanoic acid

Answer: D

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8. Aniline reacts with excess Br_2 / H_2O to give the major product

A. 1. 2-bromoaniline

B. 2. 4-bromoaniline

C. 3. 2,4-dibromoaniline

D. 4. 2,4,6-tribromoaniline

Answer: C

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9. Glucose reacts with acetic anhydride to form

A. 3

B. 5

C. 4

D. 1

Answer: B

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10. The letter D in D-glucose signifies.

A. dextrorotatory

B. configuration

C. diamagnetic nature

D. mode of synthesis

Answer: B

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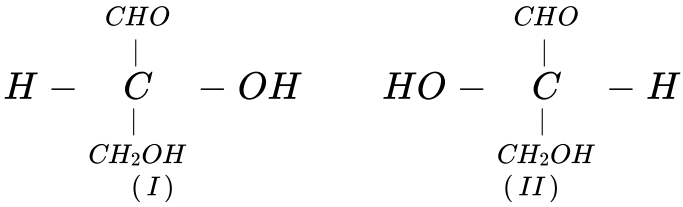
11. The given structures (I) and (II) represent configuration of the simplest sugar glyceraldehyde . Which of the following statements is not correct for the structures ?



A. (I) represents D-form while (II) represents L-form of glyceraldehyde .

B. The sugars having same configuration as D-glyceraldehyde are designated as D-sugars.

C. Natural glucose and fructose are D-Sugars.

D. D is dextrorotatory while L is laevorotatory enantiomer.

Answer: D

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12. Pick up the incorrrect statement from the following.

A. Glucose exists in two different crystalline forms , $\alpha -$ D-glucose and $\beta - D$- glucose

B. Cyclic structure of $\alpha - D -$ glucose and $\beta -$ D-glucose is called pyranose structure.

C. $\alpha -$ D-glucose and $\beta -$ D-glucose are enantiomers.

D. Cellulose is a straight chain polysaccharide made up of only β-glucose units.

Answer: C

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13. Which of the following carbon is anomeric in glucose

A. C-1 carbon

B. C-2 carbon

C. C-5 carbon

D. C-6 carbon

Answer: A

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14. A diabetic person carries a packet of glucose with him always because

A. a. glucose increases the blood sugar level slowly.

B. b. glucose reduces the blood sugar level

C. c. glucose increases the blood sugar level almost instantaneously

D. d.glucose reduce the blood sugar level slowly.

Answer: C

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15. What is the essential difference between α - and - β - forms of glucose ?

A. isomers of D(+) glucose and L(-) glucose respectively

B. diastereomers of glucose

C. anomers of glucose

D. isomers which differ in the configuration of C-2

Answer: C

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16. How many atoms are there in pyaranose ring ?

A. 3

B. 5

C. 6

D. 7

Answer: C

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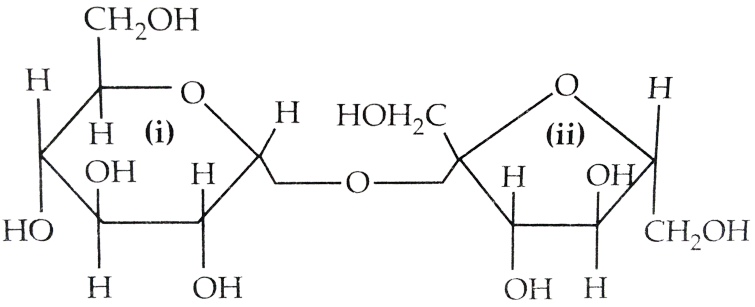
17. The correct statement about the following disaccharide



A. ring (i) is pyranose with α- glycosidic link

B. ring (i) furanose with α – glycosidic link

C. ring (ii) is pyranose with α-glycosidic link.

D. ring (ii) is pyranose with β-glycosidic link .

Answer: A

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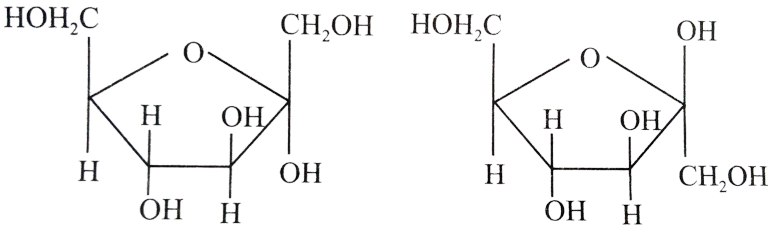
18. Five-membered ring structures of fructose are given below .

Mark the incorrect statement .



A. The five-membered ring structures are named as furanose structure.

B. The cyclic structures repressent two anomers of frustose.

C. Five-membered ring structures are named as pyranose structures.

D. These are also called Haworth structures.

Answer: C

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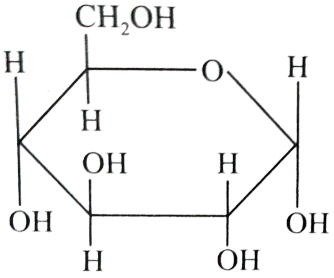
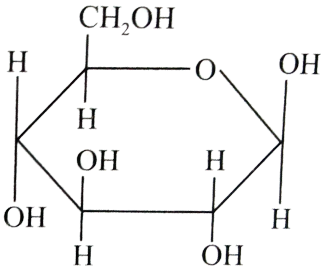
19. Study the structures of $\alpha - D$-(+) glucopyranose and $\beta - D$(+) glucopyranose and mark the correct statement.



I



II

A. Structures I and II are enantiomers

B. Structures I and II are anomers

C. The two structures I and II differ in the configuration of

C_1 and C_4

D. Both the strucrtures I and II give 2,4-DNP test.

Answer: B

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20. Among the naturally occuring carbohydrates, furanose ring is found in the

A. glucose unit of cane sugar

B. glucose unit of cellulose

C. fructose unit of cane sugar

D. galactose unit of lactose.

Answer: C

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21. Which one of the following sets of monosaccharides forms sucrose ?

A. α-D- galactopyranose and α-D-glucophyranose

B. α-D-glucopyranose and β-D-fructofuranose

C. α-D-glucopyranose and β-D-fructopyranose

D. α-glucopyranose and β-D-fructopyranose

Answer: B

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22. What are the hydrolysis products of sucrose ?

A. Fructose+Fructose

B. Glucose + Glucose

C. Glucose +Galactose

D. Glucose+Fructose

Answer: D

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23. Glycosidic linkage is :

A. amide linkage

B. ester linkage

C. ether linkage

D. acetyl linkage.

Answer: C

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24. Invert sugar is mixture of

A. a type of cane sugar

B. optically inactive form of sugar

C. mixture of glucose and galactose

D. mixture of glucose and fructose in equimolar quantities

Answer: D

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25. Which of the following statements is not true ?

A. Glucose and fructose both are monosaccharides

B. The natural glucose and fructose are D-forms.

C. The solution having equal molecules of D-glucose and D-fructose is termed as invert sugar.

D. Aldohexoses exist in 2^6 optical forms

Answer: D

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26. Maltose is made up of :

A. two α-D-glucose

B. normal $\beta - D$-glucose

C. α-and $\beta - D$-glucose

D. fructose

Answer: A

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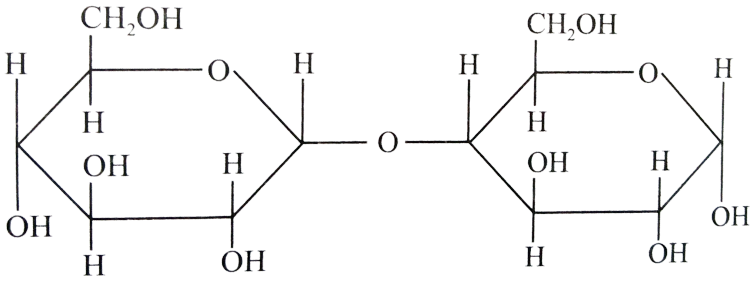
27. Study the structures of maltose and mark the incorrect statement .



A. Maltose is composed of two α-D-glucose units.

B. C-1 of one glucose is linked to C-4 of other unit.

C. It is a non-reducing sugar.

D. It is a disaccharide.

Answer: C

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28. Which one of the following is not correct ?

A. D(-) Fructose exists in furanose structure

B. D(+) Glucose exists in pyranose structure.

C. In sucrose the two monosaccharides are held together by peptide linkage

D. Maltose is a reducing sugar.

Answer: C

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29. Which one of the following statements is not true regarding $(+)$ Lactose ?

A. On hydrolysis , (+)lactose gives equal amount of D(+) glucose and D(+) galactose .

B. (+) Lactose is a β-glucoside formed by the union of a molecule of D(+) glucose and a molecule of D(+) galactose.

C. (+) Lactose is a reducing sugar and does not exhibit mutarotation .

D. (+) Lactose ,$C_{12}H_{22}O_{11}$ contains 8-OH groups.

Answer: C

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30. Glycosidic linkage in maltose/amylose is

A. $C_1 - C_4$ β linkage

B. $C_1 - C_6\beta$ linkage

C. $C_1 - C_6\alpha$ -linkage

D. $C_1 - C_4\alpha -$ linkage

Answer: D

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31. The chemical formula of starch is

A. 1. $(C_6H_{12}O_6)_n$

B. 2. $(C_6H_{10}O_5)_n$

C. 3. $C_{12}H_{22}O_{11}$

D. 4. $(C_6H_{12}O_4)_n$

Answer: B

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32. Cellulose, starch and glycogen are all the polysaccharides which contain:

A. amylopectin and glycogen

B. amylose and glycogen

C. amylose and amylopectin

D. cellulose and glycogen

Answer: C

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33. In cellulose, D-glycosidic units are joined by

A. α-1,4 glycosidic linkage

B. β-1,6 glycosidic linkage

C. β-1,4 glycosidic linkage

D. peptide linkage

Answer: C

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34. Cellulose in the form of plants is a food for cattles and sheeps but not for human beings. Explain.

A. human body does not contain cellulase hence cellulose cannot be broken into D-glucose

B. human saliva cannot break down plant cellulose in small pieces

C. bile juice present in cattle helps them to digest cellulose

D. human beings have a smaller stomach than cattle.

Answer: A

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35. Carbohydrates are stored in human body as the polysaccharide:

A. starch

B. glycogen

C. cellulose

D. amylose

Answer: B

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Proteins

1. A compound which contains both ..... And .....is called amino acid. The amino acids in polypeptide chain are joined by .....bonds.

A. amino, carboxylic , group , ester

B. amino, carboxylic group, peptide.

C. nitrogen , carbon , glycosidic

D. hydroxy, carboxylic group, peptide.

Answer: B

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2. Which of the following statements about amino acids is false

A. They are constituents of all proteins

B. Alanine having one amino and one carboxylic group.

C. Most naturally occuring amino acids have D-configuration.

D. Glycine is the only naturally occuring amino acid which is optically inactive.

Answer: C

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3. One of the different amino acids which can be synthesised in the body is:

A. Alanine

B. Lysine

C. Valine

D. Histidine

Answer: A

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4. The α-amino acid which contains the aromatic side chain is:

A. proline

B. tyrosine

C. valine

D. serine

Answer: B

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5. The number of amino acids found in proteins that a human body can synthesize is

A. 20

B. 25

C. 10

D. 100

Answer: A

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6. Which of the following is a basic amino acid ?

A. Lysine

B. proline

C. Alanine

D. Aspartic acid

Answer: A

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7. which of the following is acidic amino acid?

A. Glycine

B. Valine

C. Leucine

D. Glutamic acid

Answer: D

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

(i) $(CH_3)_2OH - \underset{\underset{|}{NH_2}}{C}\ H - COOH$

(ii) $HOOC - CH_2 - CH_2 - \underset{\underset{|}{NH_2}}{C}\ H - COOH$

(iii) $H_2N - CH_2 - CH_2 - CH_2 - COOH$

(iv) $HOOC - CH_2 - \underset{\underset{|}{NH_2}}{C}\ H - COOH$

A. (ii) and (iv)

B. (iii) and (iv)

C. (i)nad (ii)

D. (ii) and (iii)

Answer: A

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9. Amino acids usually exist in the form of Zwitter ions. This mean that they consist of

A. basic-NH_2 group and acidic -COOH group

B. the basic -$\overset{+}{N}H_3$ group and acidic $-COO^-$ group

C. basic $-NH_2$ and acidic $-H^+$ group

D. basic $-COO^-$ group and acidic -$\overset{+}{N}H_3$ groups

Answer: D

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10. Which compound can exist in a dipolar (zwitter ion) state

A. $C_6H_5CH_2CH(N=CH_2)COOH$

B. $(CH_3)_2CHCH(NH_2)COOH$

C. $C_6H_5CONHCH_2COOH$

D. $HOOCCH_2CH_2COCOOH$

Answer: B

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11. Which of the following statements is not correct ?

A. Only α-amino acids are obtained on hydrolysis of proteins

B. The amino acids which are synthesised in the body are known as non-essential amino acids.

C. There are 20 essential amino acids.

D. L-amino acids are represented by writing the $-NH_2$ group on the left side.

Answer: C

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12. The melting points and solubility in water of amino acids are generally higher than that of the corresponding halo acids. Explain.

A. amino acids exist as zwitter ions resulting in strong dipole-dipole attraction

B. amino acids are optically active

C. due to higher molecular mass of -NH_2 group molecular mass of amino acids is higher

D. they interact with water more than halo-acids and have salt like structure .

Answer: A

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13. Which of the following polymers are condensation polymes?

A. a. α-amino acids

B. b. β-amino acids

C. c. α-hydroxy acids

D. d. β-hydroxy acids.

Answer: A

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14. Which of the following statements is not correct ?

A. Proteins are polyamides formed from amino acids.

B. Except glycine, all other amino acids show optical activity.

C. Natural proteins are commonly made up of L-isomer of amino acids.

D. In α-amino acids, $-NH_2$ and $-COOH$ groups are attached to different carbon atoms.

Answer: D

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15. Which of the following represents a peptide chain ?

A. $-NH-\underset{\underset{O}{\|}}{C}-NH-\overset{\overset{|}{}}{\underset{|}{C}}-NH-\underset{\underset{O}{\|}}{C}-NH-$

B.

$$-NH-\underset{\underset{O}{\|}}{C}-CH_2-CH_2CH_2-NH-CH_2CH_2-\underset{\underset{O}{\|}}{C}-$$

C.

$$-NH-CH_2-\underset{\underset{O}{\|}}{C}-NH-CH_2-\underset{\underset{O}{\|}}{C}-NH-CH_2-$$

D. $-NH-CH_2CH_2-\underset{\underset{O}{\|}}{C}-NH-CH_2-\underset{\underset{O}{\|}}{C}-CH_2-$

Answer: C

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16. Which of the following is the correct statement ?

A. Starch is a polymer of α-glucose

B. Amylose is not a component of starch

C. Proteins are composed of only one type of amino acid.

D. In cyclic structure of fructose, there are five carbon and one oxygen atoms.

Answer: A

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17. The peptide linkage formed between glycine (NH_2CH_2COOH) and alanine $\underset{\underset{CH_3}{|}}{NH_2CH}-COOH$ to give glycylalanine can be shown as

A. $NH_2 - CH_2 - NH - \underset{\underset{CH_3}{|}}{C}\ H - COOH$

B. $NH_2 - CH_2 - CONH - \underset{\underset{CH_3}{|}}{C}\ H - COOH$

C. $H_2NCOCH_2 - \underset{\underset{CH_3}{|}}{C}\ H - CONH_2$

D. $HOOC - CH_2 - NH - NH - \underset{\underset{CH_3}{|}}{C}\ H - COOH$

Answer: B

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18. In fibrous proteins, polypeptide chains are held together by..... .

A. a.van der Waals forces

B. b.electrostatic forces of attraction

C. c.hydrogen bonds

D. d.covalent bonds.

Answer: C

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19. Keratin is a protein having larger amount of

A. hair

B. wool

C. silk

D. all of these

Answer: D

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20. Globular proteins are present in:

A. blood

B. eggs

C. milk

D. all of these

Answer: D

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21. Mark the incorrect example.

A. Keratin and myosin-Fibrous proteins

B. Insulin and albumins -Globular proteins

C. Glycylalanine-Dipeptide

D. Enzymes and haemoglobin -Derived proteins

Answer: D

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22. Primary structure of protein is due to

A. sequence in which α-amino acids are linked to one another

B. sequence in which amino acid of one polypeptide chain are joined to other chain

C. the folding patterns of polypeptide chains

D. the pattern in which the polypeptide chains are arranged.

Answer: A

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23. Secondary structure of proteins refers to

A. sequence of amino acids in polypeptide chain

B. bonds between alternate polypeptide chains

C. folding patterns of polypeptide chain

D. bonding between NH_3^+ and COO^- of two peptides.

Answer: C

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24. Most common types of secondary structures of proteins are :

A. α-helix and $\beta -$ helix structures

B. α-helix and β-pleated sheet structures

C. right and left hand twisted structures

D. globular and fibrous structures

Answer: B

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25. $\alpha -$ helix is a secondary structure of proteins formed by twisting of polypeptide chain into right handed screw like

structure. Which type of interactions are responsible for making the α-helix structure stable?

A. Petpide bonds between $-NH_2$ and $-CO$ groups of adjacent carbon chains.

B. Hydrogen bonds between -NH of amino acid in one turn with -CO of amino acid to adjacent turn.

C. $-OH$ group of one amino acid with -CO group of other amino acid on the turn.

D. Hydrogen bonds between adjacent amino acids.

Answer: B

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26. Which of the following statements is true for proteins ?

A. They act as antibodies

B. They act as hormones.

C. They catalyse the biochemical reactions.

D. all of these

Answer: D

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27. Denaturation of proteins leads to loss of its biological activity by

A. formation of amino acids

B. loss of primary structure

C. loss of both primary and secondary structure

D. loss of both secondary and tertiary structure

Answer: D

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28. Mark the wrong statement about denaturation of proteins.

A. The primary structure of the protein does not change.

B. Globular proteins are converted into fibrous proteins

C. Fibrous proteins are converted into globular proteins

D. The biological activity of the protein is destroyed.

Answer: C

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29. Which of the following is not a function of proteins?

A. Fomation of hair, wool , skin and nails.

B. As a biological catalyst in the form of enzymes.

C. As food in the form of meat, eggs.

D. As energy provider for metabolism

Answer: D

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30. On boiling the egg, what structural changes are taking place in the egg white ?

A. The colour of the egg changes from colourless to white.

B. 2° and 3° structures are destroyed but 1° structure remains intact.

C. $1^{\circ}, 2^{\circ}$ and 3° structures of egg are destroyed.

D. A reversible change takes place which can be reversed by decreasing the temperature .

Answer: B

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Enzymes

1. Enzymes are made up of

A. edible proteins

B. proteins with specific structure

C. nitrogen containing carbohydrates

D. carbohydrates.

Answer: B

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2. the conversion of maltose to glucose is possible by the enzyme :

A. zymase

B. lactase

C. maltose

D. diastase.

Answer: C

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Vitamines

1. Which of the following is a fat soluble vitamin

A. Vitamin A

B. Vitamin B_6

C. Vitamin C

D. Vitamin B_2

Answer: A

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2. Vitamin B_2 is :

A. ascorbic acid

B. riboflavin

C. thiamine

D. pyridoxine.

Answer: B

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3. Which of the following vitamins is water soluble

A. Vitamin E

B. Vitamin D

C. Riboflavin

D. Retinol

Answer: C

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4. Vitamin A is present in

A. fish liver oil

B. milk

C. butter

D. all of these

Answer: D

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5. Vegetable oils like wheat germ oil, sunflower oil etc. are the good source of

A. vitamin K

B. vitamin E

C. vitamin D

D. vitamin A

Answer: B

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6. Why must vitamin C be supplied regularly in diet?

A. it is water soluble hence excreted in urine and can't be stored in the body

B. it is fat soluble hence stored in the body and cannot be used on regular basis

C. it is required in a large amount by the body hence supplied regularly

D. it is water soluble hence used by the body on daily basic and it to be supplied regularly.

Answer: A

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7. Deficiency of vitamin E causes

A. rickets

B. scurvy

C. muscular weakness

D. beri beri

Answer: C

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8. Which of the following diseases is not correctly matched with the vitamins mentioned with it ?

A. Vitamin B_2-Cracking of lips

B. Vitamin C-Bone deformities

C. Vitamin D-Osteomalacia

D. Vitamin A-Night blindness

Answer: B

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9. Match the vitamins given in column I with the deficiency disease caused by it given in column II and mark the appropriate choice

Column I		Column II	
(A)	Vitamin B_1	(i)	Convulsions
(B)	Vitamin B_2	(ii)	Pernicious anaemia
(C)	Vitamin B_{12}	(iii)	Beri beri
(D)	Vitamin B_6	(iv)	Cheilosis

A. $(A) \rightarrow (iv), (B) \rightarrow (iii), (C) \rightarrow (i), (D) \rightarrow (ii)$

B. $(A) \rightarrow (i), (B) \rightarrow (iv), (C) \rightarrow (iii), (D) \rightarrow (ii)$

C. $(A) \rightarrow (ii), (B) \rightarrow (i), (C) \rightarrow (iv), (D) \rightarrow (iii)$

D. $(A) \rightarrow (iii), (B) \rightarrow (iv), (C) \rightarrow (ii), (D) \rightarrow (i)$

Answer: D

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10. Match the name of vitamins in column I with their sources in column II and mark the appropriate choice .

Column I		Column II	
(A)	Vitamin B_1	(i)	Milk, yeast, cereals
(B)	Vitamin B_{12}	(ii)	Meat, fish, egg
(C)	Vitamin A	(iii)	Carrots, butter, papaya
(D)	Vitamin C	(iv)	Citrus fruits, amla, green leafy vegetables

A. $(A) \rightarrow (ii), (B) \rightarrow (iii), (C) \rightarrow (iv), (D) \rightarrow (i)$

B. $(A) \rightarrow (iii), (B) \rightarrow (ii), (C) \rightarrow (iv), (D) \rightarrow (i)$

C. $(A) \rightarrow (iv), (B) \rightarrow (iii), (C) \rightarrow (ii), (D) \rightarrow (i)$

D. $(A) \rightarrow (i), (B) \rightarrow (ii), (C) \rightarrow (iii), (D) \rightarrow (iv)$

Answer: D

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Nucleic Acids

1. Characters are transferred from parents to offspring through :

A. gametes

B. genes

C. mutants

D. enzymes

Answer: B

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2. Nucleic acids are made of

A. small molecules

B. dipeptides

C. long chain polymers of nucleotides

D. polypeptides

Answer: C

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3. The human body does not produce:-

A. Enzyme

B. Vitamins

C. Proteins

D. Nucleic acid

Answer: B

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4. A nucleoside on hydrolysis gives

A. an aldopentose and a nitrogenous base

B. an aldopentose and phosphoric acid

C. an aldopentose, a nitrogenous base and phosphoric and

D. a nitrogenous base and phosphoric acid

Answer: A

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5. Thymine is

A. 5-methyluracil

B. 4-methyluracil

C. 3-methyluracil

D. 1-methyluracil

Answer: A

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6. Guanine is an example of

A. a nitrogenous base

B. a nucleoside

C. a nucleotide

D. phosphate

Answer: A

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7. Bases common to RNA and DNA are

A. adenine, guanine, cytosine

B. adenine , uracil, cytosine

C. adenine, guanine, thymine

D. guanine, uracil, thymine.

Answer: A

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8. In DNA, the complimentary bases are

A. uracil and adenine, cytosine , cytosine and guanine

B. adenine and thymine , guanine and cytosine

C. adenine and thymine, guanine and uracil

D. adenine and guanine , thymine and cytosine

Answer: B

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9. Which of the following base is not present in DNA ?

A. Thymine

B. Quinoline

C. Adenine

D. Cytosine

Answer: B

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10. A base sugar phosphate' unit in nucleic acid is known as

A. nucleotide

B. nucleoside

C. phosphotide

D. polypeptide

Answer: A

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11. RNA is

A. single helix strand

B. double helix strand

C. right hand twisted double helix strand

D. triple helix strand

Answer: A

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12. If one strand of DNA has the sequence ATGCTTGA, the sequence in the complimentary strand would be

A. TCCGAACT

B. TACGTAGT

C. TACGAATC

D. TACGAACT

Answer: D

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13. Match the column I with column II and mark the appropraite choice.

Column I		Column II	
(A)	Nucleoside	(i)	Sugar + base + phosphoric acid group
(B)	Nucleotide	(ii)	Cytosine + uracil
(C)	DNA	(iii)	Sugar + base
(D)	RNA	(iv)	Cytosine + thymine

A. $(A) \rightarrow (iii), (B) \rightarrow (i), (C) \rightarrow (iv), (D) \rightarrow (ii)$

B. $(A) \rightarrow (i), (B) \rightarrow (iv), (C) \rightarrow (iii), (D) \rightarrow (ii)$

C. $(A) \rightarrow (ii), (B) \rightarrow (iii), (C) \rightarrow (i), (D) \rightarrow (iv)$

D. $(A) \rightarrow (iv), (B) \rightarrow (ii), (C) \rightarrow (i), (D) \rightarrow (iii)$

Answer: A

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14. Match the column I with column II and mark the appropraite choice.

Column I		Column II	
(A)	Pentose sugar in DNA	(i)	Ascorbic acid
(B)	Nucleic acid	(ii)	Uracil
(C)	RNA	(iii)	Genetic material
(D)	Vitamin	(iv)	Furanose structure

A. $(A) \rightarrow (iv), (B) \rightarrow (iii), (C) \rightarrow (ii), (D) \rightarrow (i)$

B. $(A) \rightarrow (iii), (B) \rightarrow (ii), (C) \rightarrow (iv), (D) \rightarrow (i)$

C. $(A) \rightarrow (ii), (B) \rightarrow (iii), (C) \rightarrow (iv), (D) \rightarrow (i)$

D. $(A) \rightarrow (i), (B) \rightarrow (ii), (C) \rightarrow (iii), (D) \rightarrow (iv)$

Answer: A

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15. Differentiate between RNA and DNA ?

A. ribose sugar and thymine in RNA

B. deoxyribose sugar and uracil in DNA

C. ribose sugar and uracil in RNA

D. deoxyribose sugar and guanine in DNA

Answer: C

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16. Match the column I with column II and mark the appropraite choice.

Column I		Column II	
(A)	Peptide linkage	(i)	Inversion
(B)	Nucleic acid	(ii)	Polysaccharide
(C)	Hydrolysis of cane sugar	(iii)	Proteins
(D)	Starch	(iv)	Nucleotides

A. $(A) \rightarrow (ii), (B) \rightarrow (i), (C) \rightarrow (iii), (D) \rightarrow (iv)$

B. $(A) \rightarrow (iv), (B) \rightarrow (i), (C) \rightarrow (ii), (D) \rightarrow (iii)$

C. $(A) \rightarrow (iii), (B) \rightarrow (iv), (C) \rightarrow (i), (D) \rightarrow (ii)$

D. $(A) \rightarrow (i), (B) \rightarrow (iii), (C) \rightarrow (iv), (D) \rightarrow (ii)$

Answer: C

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17. The double helix model of DNA was proposed by

A. 1. Har Gobind Khorana

B. 2. Watson and Crick

C. 3. A.R. Todd

D. 4. G.W. kenner

Answer: B

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18. When adenine is attached to ribose sugar, it is called adenosine . To make a nucleotide from it, would require

A. oxygenation

B. addition of a base

C. addition of phosphate

D. hydrogenation

Answer: C

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Hormones

1. The hormone thyroxine

A. a. is secreted by pancreas

B. b. is secreted by thyroid

C. c. decreases blood sugar

D. d. does not stimulate metabolism

Answer: B

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2. Hyperglycemia implies

A. high blood-sugar level

B. low blood-sugar level

C. high concentration of salt in blood

D. low concentration of salt in blood.

Answer: A

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3. Glucocorticoids are produced by

A. a. control the carbohyrates metabolism

B. b. modulate inflammatory reactions

C. c. are involved in the reactions to stress

D. d. all of these

Answer: D

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4. Which of the following is responsible for preparing the uterus for implantation of fertilised egg ?

A. Testosterone

B. Glucocorticoids

C. Progesterone

D. Estradiol

Answer: C

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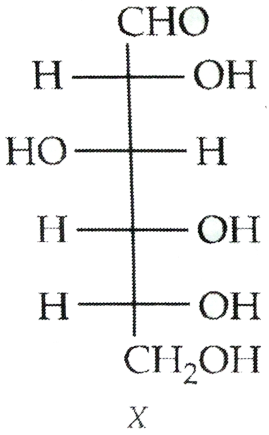
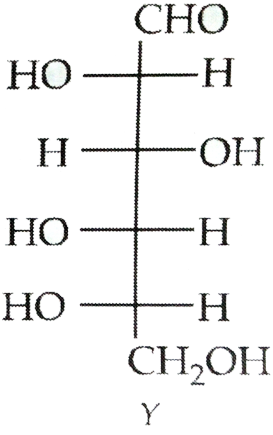
Higher Order Thinking Skills

1. Among the following statements, about the molecules X and Y , which is incorrect?



X



Y

A. X and Y are diastereomers

B. X and Y are enantiomers.

C. X and Y are both aldohexoses.

D. X is a D-sugar and Y is an L-sugar

Answer: A

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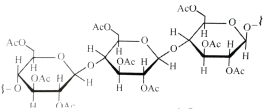
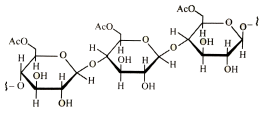
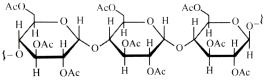
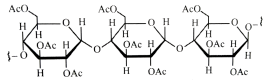
2. Cellulose upon acetylation with excess acetic anhydride/ H_2SO_4 (catalytic) gives cellulose triacetate whose structure is

A. 

B. 

C. 

D. 

Answer: A

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3. During the process of digestion, the proteins present in food materials are hydrolysed to amino acids. The two enzymes involved in the process are:

$$\xrightarrow{\text{Enzyme (A)}} \text{Polypeptides}$$

$$\xrightarrow[\text{Enzyme (B)}]{} \text{Amino acids}$$

A. invertase and zymase

B. amylase and maltase

C. diastase and lipase

D. pepsin and trypsin

Answer: D

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4. Within the list shown below, the correct pair of structures of alanine in pH ranges 2-4 and 9-11 is

I. $H_3N^+CH(CH_3)CO_2H$

II. $H_2NCH(CH_3)CO_2^-$

III. $H_3N^+CH(CH_3)CO_2^-$

IV. $H_2NCH(CH_3)CO_2H$

A. I,II

B. I,III

C. II, III

D. III,IV

Answer: A

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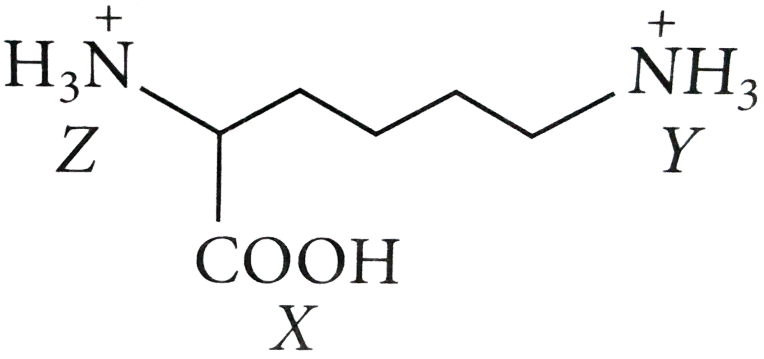
5. Consider the compound



and arrange X,Y, Z in order of increasing acid strengths .

A. $X > Z > Y$

B. $Z < X < Y$

C. $X > Y > Z$

D. $Z > X > Y$

Answer: A

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6. In aqueous solution amino acids moslty exit as

A. $NH_2 - CHR - COOH$

B. $NH_2 - CHR - COO^-$

C. $\overset{+}{N}H_3CHRCOOH$

D. $H_3\overset{+}{N}CHRCOO^-$

Answer: D

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7. Amino acids are least soluble

A. at pH around 7

B. at pH 7

C. at their isoelectric points

D. none of these

Answer: C

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Ncert Exemplar

1. Glycogen is a branched chain polymer of $\alpha - D$ glucose units in which chain is formed by $Cl - C4$ glycosidic linkage where as branching occurs by the formation of $C1 - C6$ glycosidic linkage. Structure of glycogen is similar to .... .

A. amylose

B. amylopectin

C. cellulose

D. glucose

Answer: B

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2. Which of the following polymer is stored in the liver of animals ?

A. Amylose

B. Cellulose

C. Amylopectin

D. Glycogen

Answer: D

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3. Sucrose (cane sugar) is a disaccharide. One molecule of sucrose on hydrolysis gives..... .

A. 2 molecules of glucose

B. 2 molecules of glucose +1 molecule of fructose

C. 1 molecules of glucose +1 molecule of fructose

D. 2 molecules of fructose

Answer: C

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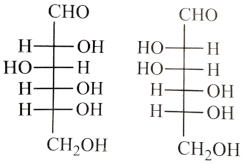
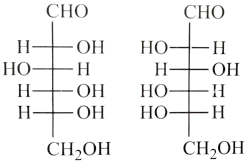
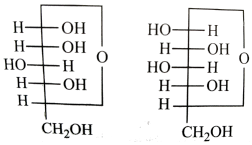
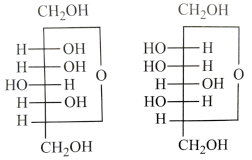
4. Which of the following pairs represents anomers ?

A. 

B. 

C. 

D. 

Answer: C

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5. 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

Answer: C

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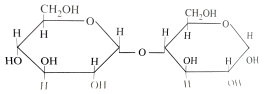
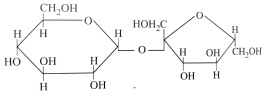
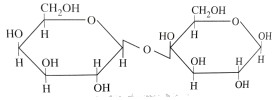
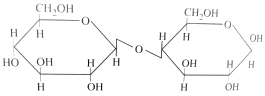
6. In disaccharides, if the reducing groups of monosaccharides, i.e., aldehydic or ketonic groups are bonded, these are non-

reducing sugars. Which of the following disaccharide is a non-reducing sugar?

A. 

B. 

C. 

D. 

Answer: B

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7. Which of the following acids is a vitamin?

A. Aspartic acid

B. Ascorbic acid

C. Adipic acid

D. Saccharic acid

Answer: B

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8. 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'

Answer: A

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9. Nucleic acids are the polymers of

A. nucleosides

B. nucleotides

C. bases

D. sugars

Answer: B

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10. Which of the following statements is not true about glucose?

A. It is an aldohexose.

B. On heating with HI it forms n-hexane

C. It is present in furanose form.

D. It does not give 2,4-DNP test.

Answer: C

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11. 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

Answer: A

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12. DNA and RNA contain four bases each. Which of the following bases in not present in RNA?

A. Adenine

B. Uracil

C. Thymine

D. Cytosine

Answer: C

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13. Which of the following B group vitamins can be stored in our body?

A. Vitamin B_1

B. Vitamin B_2

C. Vitamin B_6

D. Vitamin B_{12}

Answer: D

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14. Which of the following bases is not present in DNA

A. Adenine

B. thymine

C. Cytosine

D. Uracil

Answer: D

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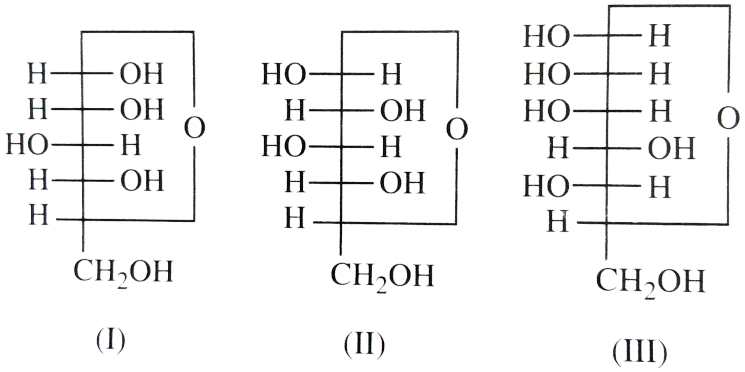
15. Three cyclic structure of monosaccharides are given below.

Which of these are anomers ?



(I) (II) (III)

A. I and II

B. II and III

C. I and III

D. III is anomer of I and II

Answer: A

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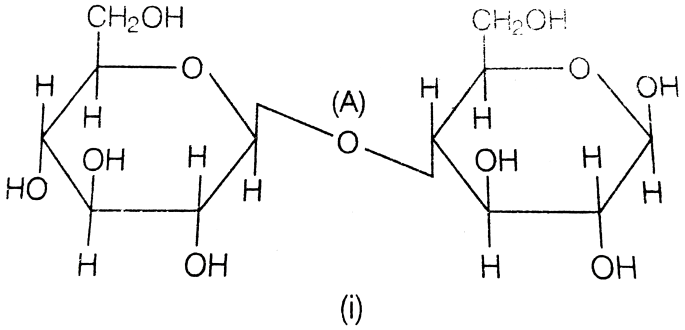
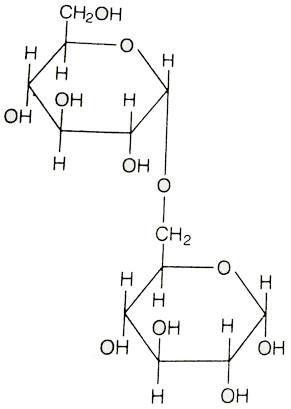
16. Three structures are given below in which two glucose units are linked. Which of these linkages between glucose units are

between C_1 and C_4 and which linkages are between C_1 and C_6

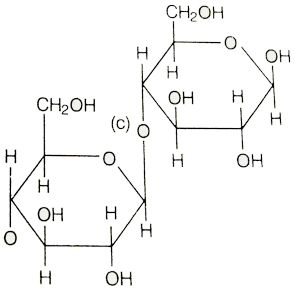
?



(i)



(ii)



(iii)

A. a.(A) is between C-1 and C-4 , (B) and (C) are between C-1 and C-6

B. (A) and (B) are between C-1 and C-4 , (C) is between C-1 and C-6

C. (A) and (C) are between C-1 and C-4, (B) is between C-1 and C-6

D. (A) and (C) are between C-1 and C-6, (B) is between C-1 nad C-4.

Answer: C

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17. Optical rotations of some compounds along with their structures are given below. Which of them have D-configuration ?

A. I, II, III

B. II, III

C. I,II

D. III

Answer: A

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18. Which of the following reactions of glucose can be explained only by its cyclic structure?

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.

Answer: C

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Assertion And Reason

1. Assertion : Polysaccharides are called non-sugars.

Reason : Carbohydrates which yield a large number of monosaccharide units on hydrolysis are called polysaccharides.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: B

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2. Assertion : Maltose and lactose are examples of reducing sugars.

Reason : Maltose and lactose reduce Fehling's solution and Tollens' reagent.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A

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3. Assertion : Glucose gets oxidised to gluconic acid on reaction with mild oxidising agent like bromine water.

Reason : Glucose contains a keto group.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: C

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4. Assertion : Glucose is correctly named as D-(+)-glucose. ' 3

Reason : 'D' before the name of glucose represents its dextrorotatory nature.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: C

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5. Assertion : D-glucose is dextrorotatory whereas L-glucose is laevorotatory.

Reason : D-compounds are always dextro and L-compounds are always laevorotatory

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: C

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6. Assertion : Glucose reacts with phenyl hydrazine and Fehling's solution but not with $NaHSO_3$.

Reason : $NaHSO_3$ cannot break the ring structure.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: D

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7. The two cyclic hemiacetal forms of glucose differing only in the configuration of the hydroxyl group at C-1 are called

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A

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8. Assertion: Sucrose is a non reducing sugar.

Reason : Sucrose is a disaccharide formed by glycosidic linkage between C-1 of α-glucose and C-2 of β-fructose.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A

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9. Assertion: Hydrolysis of sucrose brings about a change in sign of rotation from dextro to laevo.

Reason: Hydrolysis always changes the optical rotation of a compound.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: C

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10. Assertion: All naturally occuring α-amino acids are optically active

Reason: Most naturally occuring amino acids have D-configuration.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: D

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11. Assertion: All enzymes found in cells are invariably proteins which catalyse biological reactions.

Reason : Enzymes act efficiently at a moderate temperature and pH.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: B

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12. Assertion (A) In presence of enzyme, substrate molecule can be attacked by the reagent effectively.

Reason (R) Active sites of enzymes hold the substrate molecule in a suitable position.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A

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13. Assertion: Vitamin D cannot be stored in our body.

Reason : Vitamin D is fat soluble vitamin and is excreted out of the body with urine.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: D

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14. Assertion: Purine bases present in DNA are adenine and guanine.

Reason: The base thymine is present in RNA while base uracil is present in DNA.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: C

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15. Assertion: The two strands of DNA are complementary to each other

Reason: Adenine specifically forms hydrogen bonds with guanine whereas cytosine forms hydrogen bonds with thymine.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: C

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