



CHEMISTRY

BOOKS - CHHAYA CHEMISTRY (BENGALI ENGLISH)

BIOMOLECULES

Warm Up Exercises

1. Why are monosaccharides except dihydroxyacetone optically active?



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2. Name two disaccharides which on hydrolysis produce two similar and two different monosaccharides.



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3. Though benzene is water-insoluble, glucose and sucrose are water-soluble. Why?



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4. Name the hydrolytic products of cane sugar and the enzyme required for the hydrolysis



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5. What are reducing and non-reducing sugars?

Give example



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6. Give examples of (i) a trisaccharide (ii) a tetrasaccharide (iii) two polysaccharides (iv) one non-reducing disaccharide (v) one reducing

disaccharide (vi) one reducing ketohexose (vii)
one ketoheptose (viii) one optically inactive
ketose



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7. What do you mean by D- and L-glucose? State the relationship between D and L sign with nature of optical rotations.



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8. Why is naturally occurring glucose called dextrose?



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9. How many chiral carbons are present in an aldohexose and ketohexose? How many 3D symmetry is possible in each?



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10. Prove that the six carbon atoms of glucose are linked linearly.



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11. Define epimers. Give example.



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12. What do you mean by glycosidic bonds?



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13. Why does glucose not exhibit all characteristics reactions of aldehydes?



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14. Aldehydes reacts with two molecules of ethanol to form acetal, whereas glucose requires one molecule of ethanol. Why?



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15. What do you understand by mutarotation?



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16. Define anomers. Are they synonymous to diastereoisomers?



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17. State the nature of tautomerism that occurs during the inter-conversion between open-chain & closed ring forms of glucose.



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18. Draw the Haworth projection formula of $\alpha - D - (+) -$ glucopyranose.



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19. Draw the Haworth projection formula of $\beta - D - (-) -$ fructofuranose.



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20. How can you differentiate between D-glucose and D-fructose using Tollens' reagent or Fehling's

solution?



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21. What do you mean by inversion of cane sugar.



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22. Sucrose is a reducing or non-reducing sugar.

Explain



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23. Name the two components of starch. State the nature of glycosidic bonds present in it.



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24. Grass is the food of herbivores but not for human beings. Why?



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25. Define amino acid. State the importance of proteins in human body.



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26. What do you mean by essential and non-essential amino acids?



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27. State the configuration of natural amino acids.



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28. Name an optically inactive amino acid.





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29. Why do amino acids have high melting points and high dipole moments?



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30. Amino acids are soluble in water but not in benzene. Why?



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31. Name one of neutral, acidic and basic amino acid.



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32. What do you mean by isoelectric point of an amino acid? Write down the structure formula of alanine at pI.



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33. How does pI help in isolation of amino acids?



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34. State the structure formula of alanine



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35. Hydrolysis of a tripeptide produces glycine valine and phenylalanine. write down the possible sequence of the tripeptide using 3-lettered symbols.



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36. What is meant by C-and Nterminal of a peptide ?



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37. How many secondary structures of a protein are possible ?



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38. what kind of attractive force act in α -helix ?



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39. Globular proteins are water-soluble, while fibrous proteins are. explain.



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40. Why are proteins optically active?



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41. Towards which electrode will an amino acid move whose $pH > pI$?



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42. Mention the intramolecular forces acting in the tertiary structure of globular proteins



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43. Which force will act between glutamic acid and lysine in a proteins.



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44. Name two amino acid residues that can be linked by disulphide bonds.



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45. Define protein denaturation.



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46. Explain the phenomenon of coagulation of egg white on application of heat. Is it a reversible reaction?



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47. Name and state the role of one fibrous protein and one globular protein.



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48. Give example of (i) structural protein (ii) transport protein (iii) metabolic regulatory protein (iv) antibody.



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49. State reason behind geometrical isomerism of peptide bond.



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50. What do you mean by cofactor, coenzyme and prosthetic group?



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51. Which enzyme helps to decoagulate clotted blood?



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52. Which disease occurs due to lack of phenylalanin hydroxylase?



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53. Which enzyme deviciency causes albinism?



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54. Which enzyme convert sucrose into glucose and fructose?



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55. Explain the role of the following enzymes in industries (i) invertase (ii) α -amylase.



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56. Define hormones. State the nature of these compounds.



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57. Why are hormones called chemical messengers?



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58. What do you mean by adrenocortical hormones?



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59. Which glands synthesise hormones?



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60. State the function of glucagon.



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61. What is hypothyroidism? State its clinical symptoms.



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62. State the chemical nature of androgens and oestrogens. Mention their roles.



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63. What is testosterone?



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64. Why are lipids soluble in non-polar solvents?



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65. What is wax? Give the name and structural formula of the bee wax.



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66. What are fats and oils? Differentiate between them.



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67. State the requirement of triglycerols in human body.



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68. Mention the structural difference between phospholipids and triglycerides.



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69. How do phospholipids protect cells?



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70. Which vitamins are included under lipids?



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71. How many C-atoms are presents in eicosanoids?



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72. Which lipids can form micelles like soaps?



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73. Which lipids contain perhydro-1, cyclopentanophenanthrene system ?



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74. Which steroid is the most abundant in human body?



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75. Mention the importance of steroids in human body.



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76. Give example of one water -soluble and one fat -soluble vitamine.



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77. What is xerophthalmia? Which vitamin deficiency causes it ?



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78. What do you mean by hypervitaminosis and avitaminosis?



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79. Fresh tomato is a better source of vitamin C than canned tomatoes. Why?



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80. What are the sources of vitamin C?



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81. Which vitamins molecule contains a cobalt atoms ?



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82. Which vitamins is called ascorbic acid?



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83. Which vitamins is formed from β -carotene present in carrots?



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84. Which vitamins helps to stop bleeding?



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85. What is cyanocobalamin? Which disease is caused due to its deficiency?



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86. Point out the vitamins present in the following

(i) egg, (ii) milk, (iii) orange, (iv) spinach, (v) tomato, (vi) mango, (vii) groundnut, (viii) amla and (ix) fish



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87. Define nucleotide and give an example.



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88. State different types of RNA.



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89. How are two polynucleotide strands arranged in a DNA molecule?



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90. Name the complementary bases of adenine and guanine in DNA.



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91. Name the purine bases present in DNA and a RNA.



Watch Video Solution

92. Name the pyrimidine bases present in DNA and RNA



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93. State two major roles of nucleic acid.



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94. Name a pyrimidine present in DNA but not in RNA.



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95. Name a pyrimidine present in RNA only.



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96. Name the nucleotides of RNA.



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97. Name the nucleotides of DNA.



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98. Which carbon pentose sugar is linked to the base of of a nucleotide?



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99. Write down the full name of DNA and RNA.



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100. Define nucleoside. Give an example.



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101. Distinguish between nucleoside and nucleotide.



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102. Distinguish between DNA and RNA.



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103. Name the hydrolytic products of DNA and RNA.



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104. State the uses of DNA fingerprinting.



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105. Name the sugars present in DNA and RNA.



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106. Give the terms used for nucleotide polymer.



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107. Name the common bases present in DNA and RNA.



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108. Name the monomeric unit of nucleic acid.



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109. How many H-bonds are there between A and T?



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110. How many H-bonds are there between G and C?



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111. Which nucleic acid does not have uracil?



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112. Which nucleic acid does not have thymine?



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113. Name a nucleotide of RNA carrying adenine.



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114. State the structural difference between ribose and deoxyribose.



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115. Which nucleic acid acts as a genetic material?



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Very Short Answer Type Vsa

1. Which polysaccharide is stored in animal liver?



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2. What kind of ring is formed by fructose in sucrose?



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3. State the configuration of alpha amino acids.



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4. Name two essential amino acids.





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5. State the nature of glycosidic bonds in starch and cellulose.



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6. Which enzyme is used in the treatment of heart disease?



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7. Which solvent allows smooth mutarotation of glucose ?

A. cresol

B. pyridine

C. cresol + pyridine

D.

Answer:



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8. Which bond helps to stabilise α -helix?



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9. State the pH at which the solubility of amino acids is the least.



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10. Which phenomenon does the coagulation of egg white refer to?



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11. State the possible formula of a tripeptide which on hydrolysis produce glycine alanine and valine.



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12. State the name and structural formula of bee wax.



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13. How many 5-membered rings and 6-membered rings are found in steroids?



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14. Which steroid is abundant in living bodies?



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15. Name two components of essential oil.



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16. Name the two classes of nitrogenous bases in nucleic acid.



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17. Name the two pentose sugars present in DNA and RNA



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18. Explain the formation of sugar-phosphate backbone in DNA



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19. Define invert sugar



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20. Given an example of amino acid containing 2° amine.



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21. Why do enzymes accelerate biochemical reactions?



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22. How many isoprene units are present in β - carotene ? What kind of terpene is it?



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23. What is the structural feature characterising reducing sugars?



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24. Mention the names of two carbohydrates which act as biofuels.



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25. Name the enzyme present in the saliva of human beings and mention its role.



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26. Why is α -helix name as 3.6_{13} helix ?

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27. Mention the amino acids which exhibit aromatic properties.

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28. Indicate the total number of basic groups in the following form of lysine:





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29. Name two alpha- amino acids which form a dipeptide, whose methyl ester is 100 times more sweet than cane sugar.



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30. Define native state with reference to protein.



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31. Name the enzyme that breaks large protein into small peptides.



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32. What happens when L-glucose is treated with tollens' reagent?



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Short Answer Type Sa

1. α -amino monocarboxylic acids have two pK_a values. Explain.



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2. What is the reason for the specific action of enzymes?



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3. Define reducing sugars. Why are ketons, devoid of -CHO group, termed as reducing sugars?



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4. Indicate the nature of changes that occur when egg protein is boiled.



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5. How will you prove that

6C atoms of a glucose molecule forms a simple chain and



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6. How will you prove that the carbonyl group is present at C-2 atom of fructose molecule.



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7. Explain the effect of denaturation on protein structure. Give an example of unidirectional protein denaturation.



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8. What is the monomer unit of protein? Give one example of such a monomer which contains sulphur. Write its zwitterionic form.



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9. Identify:

the vitamin responsible for blood coagulation,



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10. Identify:

the vitamin not stored inside human body.



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11. Identify:

the vitamin whose deficiency causes scurvy



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12. Identify:

the vitamin whose deficiency causes beriberi



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13. Identify:

the vitamin included under lipid,



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14. Identify:

the enzyme that causes hydolysis of cellulose



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15. Identify:

the enzyme that can reduce chances of heart attack,



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16. Identify:

the enzyme used in the preparation of invert sugar,



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17. Identify:

the group -B vitamin which is synthesised in human body.



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18. If the base sequence of one strand of DNA double stranded molecule is 'ATCGTCCA', state the complementary base sequence.



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19. State two important roles of nucleic acid.



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20. Which lipids are structurally similar to soaps?

How does lipid bilayer formation protect the cell?



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21. Name two hormones that control blood glucose level. Mention their sources and chemical nature.



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22. Indicate the nature of linkages responsible for formation of cross-linkage of polypeptide for chains



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23. Indicate the nature of linkages responsible for formation of β -sheet structure.



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24. What change in free energy occurs during conversion of ATP to ADP?



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25. Which bond link the phosphoric acid molecules together in ATP?



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26. What is essential the difference between alpha-form and beta-form of D-glucose?



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27. Fructose contains a keto group but still reduces Tollen's reagent. Explain



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28. Glycine exists as a zwitterion but o-and p-aminobenzoic acids do not-Give reason



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29. Which disaccharides do not exhibit mutarotation? give an example.



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30. A decapeptide (M. mass = 796) on complete hydrolysis gives glycine, alanine and phenylalanine. Glycine contributes 47% to the total mass of hydrolysed products. Calculate the number of glycine units present in the decapeptide.



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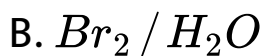
31. What is the function of "fibrinogen" in the blood?



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Solved Wbchse Scanner

1. Which of the following reagents converts glucose to gluconic acid



Answer: B



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2. What is the visual change observed when glucose is heated with Fehling' solution?



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3. Write the structure of the dipeptide formed by alanine and glycine. Indicate the bond.



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4. What are the differences between the monomer units of DNA and RNA?



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5. Write down the structure of D-glucose. How it differs from the structure of D-fructose?



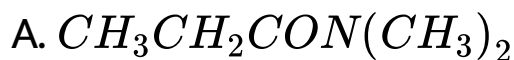
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6. What is called denaturation of proteins?



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7. In which of the following peptide bond is present



Answer: D



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

A. uracil

B. thymine

C. guanine

D. cytosine

Answer: A



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9. What is polysaccharide ? Explain with example.



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10. What is meant by primary structure of protein?



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11. In the solid state which of the following is the structure of alanine?

A. 

B. 

C. 

D. 

Answer: B



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12. What are meant by aldose and ketose? Write with example.



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13. Write the name and biological function of a protein hormone.



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14. In which of the following orders base,phosphate and sugar are arranged in the nucleotide of DNA

A. base-phosphate-sugar

B. phosphate-sugar-base

C. phosphate-base-sugar

D. sugar-base-phosphate

Answer: B



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15. What is meant by primary structure of a protein?



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16. Show that sucrose is a disaccharide.



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Solved Cbse Scanner

1. What is meant by Peptide linkage



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2. What is meant by biocatalysts ?



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3. Write the products of hydrolysis of lactose.



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4. Define the terms: Nucleotide



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[Watch Video Solution](#)

5. Define the terms: Anomers



[Watch Video Solution](#)

6. Define the terms: Essential amino acid



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7. How are vitamins classified ? Name the vitamin responsible for the coagulation of blood



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8. Define as related to proteins: Peptide linkage



Watch Video Solution

9. What is meant by primary structure of a protein?



Watch Video Solution

10. Define as related to proteins: Denaturation





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11. Write the name of two monosaccharides obtained on hydrolysis of lactose sugar



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12. Why vitamin C cannot be stored in our body?



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13. What is the difference between a nucleoside and nucleotide?



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14. Write the name of monosaccharides which are obtained after hydrolysis of lactose



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15. What type of bonding is responsible for the stability of α -helix?



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16. Write the difference between nucleotide and nucleoside



[Watch Video Solution](#)

17. After watching a programme on TV about the presence of carcinogens (cancer causing agents) potassium bromate and potassium iodate in bread and other bakery products, Ritu a class XII student decided to aware others about the

adverse effects of these carcinogens in foods, She consulted the school principal and requested him to instruct the canteen contractor to stop selling sandwiches, pizzas, burgers, and other bakery products to the students. The principal took an immediate action and instructed the canteen contractor to replace the bakery product with some proteins and vitamins rich food like fruits, salads, sprouts etc. The decision was welcomed by the parents and students.

What are the values (at least two) displayed by Ritu?



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18. After watching a programme on TV about the presence of carcinogens (cancer causing agents) potassium bromate and potassium iodate in bread and other bakery products, Ritu a class XII student decided to aware others about the adverse effects of these carcinogens in foods, She consulted the school principal and requested him to instruct the canteen contractor to stop selling sandwiches, pizzas, burgers, and other bakery products to the students. The principal took an immediate action and instructed the canteen contractor to replace the bakery product with

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Which polysaccharide component of carbohydrates is commonly present in bread?



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Write the two types of secondary structure of proteins



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20. After watching a programme on TV about the presence of carcinogens (cancer causing agents) potassium bromate and potassium iodate in bread and other bakery products, Ritu a class XII student decided to aware others about the adverse effects of these carcinogens in foods, She consulted the school principal and requested him to instruct the canteen contractor to stop selling sandwiches, pizzas, burgers, and other bakery products to the students. The principal took an immediate action and instructed the canteen contractor to replace the bakery product with

some proteins and vitamins rich food like fruits, salads, sprouts etc. The decision was welcomed by the parents and students.

Give two example of water soluble vitamins



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21. After watching a programme on TV about the presence of carcinogens (cancer causing agents) potassium bromate and potassium iodate in bread and other bakery products, Rupali a class XII student decided to aware others about the adverse effects of these carcinogens in foods, She

consulted the school principal and requested him to instruct the canteen contractor to stop selling sandwiches, pizzas, burgers, and other bakery products to the students. The principal took an immediate action and instructed the canteen contractor to replace the bakery product with some proteins and vitamins rich food like fruits, salads, sprouts etc. The decision was welcomed by the parents and students.

What are the values (at least two) displayed by Rupali?



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22. After watching a programme on TV about the presence of carcinogens (cancer causing agents) potassium bromate and potassium iodate in bread and other bakery products, Rupali a class XII student decided to aware others about the adverse effects of these carcinogens in foods, She consulted the school principal and requested him to instruct the canteen contractor to stop selling sandwiches, pizzas, burgers, and other bakery products to the students. The principal took an immediate action and instructed the canteen contractor to replace the bakery product with some proteins and vitamins rich food like fruits,

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Write the two types of secondary structure of proteins



Watch Video Solution

24. After watching a programme on TV about the presence of carcinogens (cancer causing agents) potassium bromate and potassium iodate in bread and other bakery products, Rupali a class XII student decided to aware others about the adverse effects of these carcinogens in foods, She consulted the school principal and requested him to instruct the canteen contractor to stop selling sandwiches, pizzas, burgers, and other bakery products to the students. The principal took an immediate action and instructed the canteen contractor to replace the bakery product with some proteins and vitamins rich food like fruits,

salads, sprouts etc. The decision was welcomed by the parents and students.

Give two example of water soluble vitamins



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25. Define the following with an example of each-
Polysaccharides



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26. Define the following with an example of each-
Denatured protein



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27. Define the following with an example of each-
Essential amino acids



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28. Write the product when D-glucose reacts with
conc, HNO_3



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29. Amino acids show amphoteric behaviour. Why?



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30. Write one difference between α -helix and β -pleated structures of proteins



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Solved Ncert Textbook Problems

1. Glucose or sucrose are soluble in water but cyclohexane or benzene are insoluble in water.

Explain



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2. What are the expected products of hydrolysis of lactose?



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3. How do you explain the absence of aldehyde group in the pentacetate of D-glucose?



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



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5. Where does the water present in the egg go after boiling the egg?



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6. Why cannot vitamin C be stored in our body?



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7. What products would be formed when a nucleotide from DNA containing thymine is hydrolysed?



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8. When RNA is hydrolysed, there is no relationship among the quantities of different bases obtained. What does this fact suggest about the structure of RNA?



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Ncert Exercise Questions

1. What are monosaccharides?



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2. What are reducing sugars?



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3. Write two main functions of carbohydrates in plants



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4. Classify the following into monosaccharides and disaccharides. Ribose, 2-deoxyribose, maltose, galactose, fructose and lactose.



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5. What do you understand by the term glycosidic linkage?



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6. What is glycogen? How is it different from starch?



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7. What are the hydrolysis products of (i) sucrose and (ii) lactose?



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8. What is the basic structural difference between starch and cellulose?



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9. What happen when D-glucose is treated with the following reagents? (1) HI (2) Bromine water (3) HNO_3



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10. Enumerate the reactions of D-glucose which cannot be explained by its open chain structure.



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11. What are essential and non-essential amino acids? Give two examples of each type.



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12. Define the following as related to proteins: (i) Peptide linkage (ii) Primary structure (iii) Denaturation.



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13. What are the common types of secondary structure of proteins?



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14. What type of bonding helps in stabilising the α -helix structure of proteins?



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15. Differentiate between globular and fibrous proteins.



Watch Video Solution

16. How do you explain the amphoteric behaviour of amino acids?



Watch Video Solution

17. What are enzymes?



Watch Video Solution

18. What is the effect of denaturation on the structure of proteins?



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19. How are vitamins classified ? Name the vitamin responsible for the coagulation of blood.



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20. Why are vitamin A and vitamin C essential to us? Give their important sources.



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21. What are nucleic acids? Mention their two important functions.



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22. What is the difference between a nucleoside and nucleotide?



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23. The two strands in DNA are not identical but are complementary. Explain.



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24. Write the important structural and functional differences between DNA and RNA.



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25. What are different types of RNA found in cell?



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Higher Order Thinking Skill Hots Questions

1. How many chiral carbons are found in an aldohexose? How many D and L-isomers are possible in each? State the relationship between D-and L-isomers of an aldohexose. Give example



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2. Name the lipids having perhydro-1, 2-cyclopentano-phenanthrene system. Name an

important steroid formed in gall bladder and state its function.



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3. What happens when glucose treated with dilute NaOH ?



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4. Which aldohexose other than D-glucose can produce the same dicarboxylic acid obtained due to oxidation of D-glucose by HNO_3 ?



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5. Different value of specific rotation of optically active amino acids are obtained at different pH. Explain.



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6. A tripeptide on complete hydrolysis produces glycine, alanine and phenylalanine in 1 : 1 : 1 molar ratio. What are the probable structures of the tripeptide?



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7. Why disaccharides obtained from monosaccharides like glucose ($C_6H_{12}O_6$) has the formula $C_{12}H_{22}O_{11}$ instead of $C_{12}H_{24}O_{12}$?



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8. Write down the structural difference between amylopectin and cellulose.



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9. A DNA molecule has higher melting point having more number of GC pairs than another DNA molecule which has more number of AT pairs. What conclusion can be drawn from this fact?



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10. Why glucose and fructose produce the same osazone?



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11. 2 DNA samples, X & Y have m.p 340 and 350 K respectively. Which sample has higher CG base pair & Why?



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12. The structure of aspartame (a peptide and an artificial sweetener) is given below:



Name the functional groups present in aspartame.



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13. The structure of aspartame is given below:

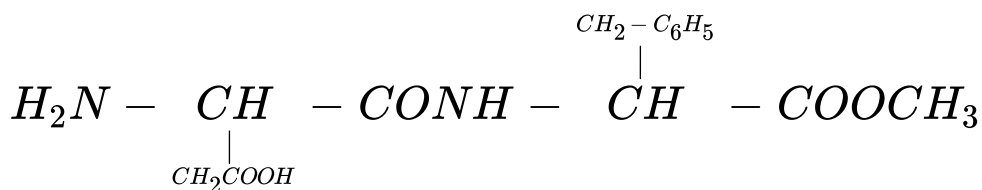


Give the zwitterionic structure.



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14. The structure of aspartame (a peptide and an artificial sweetener) is given below:



Name the amino acids obtained from hydrolysis of aspartame



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15. Explain why the k_a and k_b values of α -amino acids are very low.



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16. Distinguish between anomer and epimer with suitable examples?



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17. An optically active amino acid (A) having molecular formula $C_5H_{11}NO_2$ can exist in three forms depending upon the pH of the medium. Write the structure of (A) in aqueous medium. What are such ions called? In which medium the cationic and the anionic forms of the amino acid (A) exist and towards which electrode they migrate in an electric field?

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18. A tetrapeptide on partial hydrolysis produces three dipeptides such as Ser-Thr, Thr-Hyp and Pro-Ser. Identify the tetrapeptide. Write its structure.



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19. Write the structure of serine at $\text{pH} = 1$ & $\text{pH} = 11$



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20. Vitamin B complex is a combination of several other vitamin. Name the constituent vitamins



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21. Draw the Fischer projection formula of the enantiomer of $\alpha - D - (+) -$ glucopyranose and write its name.



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Higher Order Thinking Skill Hots Questions Name
The Following

1. Acidic group in DNA



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2. A vitamin which is neither fat-soluble or water-soluble



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3. Disease caused due to deficiency of tyrosinase



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4. An amino acid with no chiral carbon atom.



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5. A vitamin which prevents hair loss.



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6. The nucleic acid base with two possible binding sites in DNA.



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Entrance Question Bank

1. In aqueous solution, glucose remains as-

- A. only in open chain form
- B. only in pyranose form
- C. only in furanose form
- D. in all three forms in equilibrium

Answer: D



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2. Which one is not a constituent of nucleic acid

A. uracil

B. guanidine

C. phosphoric acid

D. ribose sugar

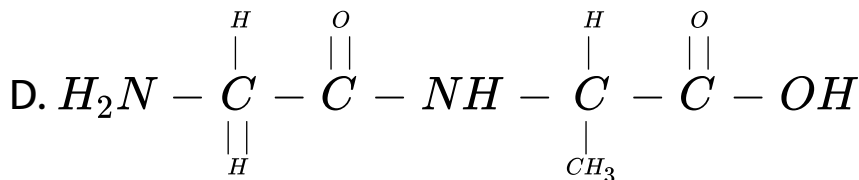
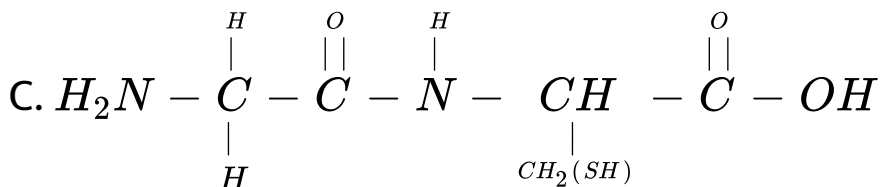
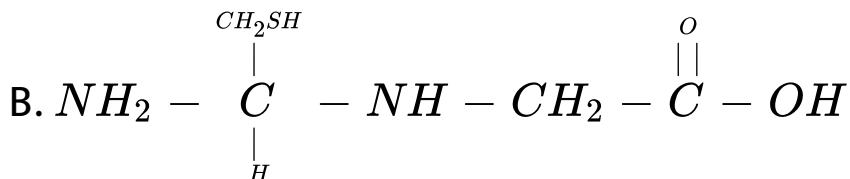
Answer: B



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3. The correct structure of the dipeptide gly-ala is-

A. 



Answer: C



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4. Ribose and 2-deoxyribose can be differentiated by-

A. Fehling's reagent

B. Tollen's reagent

C. Barfoed's reagent

D. osazone formation

Answer: D



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5. The number of amino acids and number of peptide bonds in a linear tetrapeptide (made of different amino acids) are respectively-

A. 4 and 4

B. 5 and 5

C. 5 and 4

D. 4 and 3

Answer: D



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6. In DNA, the consecutive deoxynucleotides are connected via-

A. phosphodiester linkage

B. phosphomonoester linkage

C. phosphotriester linkage

D. amide linkage

Answer: A



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7. Among the following statement about the molecules X and Y, the one (s) which is (are) correct is (are) -



A. X and Y are diastereoisomers

B. X and Y are enantiomers

C. X and Y are aldohexoses

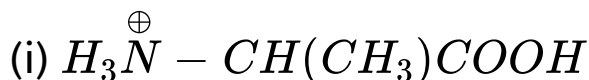
D. X is a D-sugar and Y is a L-sugar

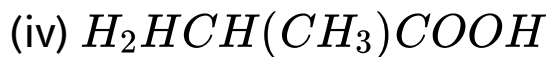
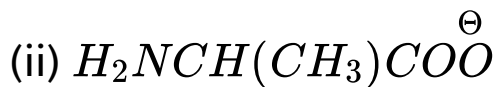
Answer: B::C::D



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





A. (i), (ii)

B. (i), (iii)

C. (ii), (iii)

D. (iii), (iv)

Answer: A



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9. ADP and ATP differ in the number of-

A. phosphate units

B. ribose units

C. adenine base

D. nitrogen atom

Answer: A



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10. The presence or absence of hydroxy group on which C-atom of sugar differentiates RNA and DNA

A. 2nd

B. 3rd

C. 4th

D. 1st

Answer: A



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11. Which one of the following statement is correct-

A. all amino acids are optically active

B. all amino acids except glycine are optically active

C. all amino acids except glutamic acid are optically active

D. all amino acids except lysine are optically active

Answer: B



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12. Which one of the following substances can be identified by the Molisch's test-

A. sugars

B. amines

C. ketones

D. nitro compounds

Answer: A



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13. In photosynthesis, the synthesis of each glucose molecule is related to-

- A. 8 molecules of ATP
- B. 6 molecules of ATP
- C. 18 molecules of ATP
- D. 10 molecules of ATP

Answer: C



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14. Which one of the following base is not present in DNA-

A. thymine

B. quinoline

C. adenine

D. cytosine

Answer: B



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15. Which of the vitamins given below is water soluble-

A. vitamin C

B. vitamin D

C. vitamin E

D. vitamin K

Answer: A



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16. Thiol group is present in-

A. cytosine

B. cystine

C. cysteine

D. methionine

Answer: C



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17. Which of the following compounds will behave as a reducing sugar in an aqueous KOH solution-

A. 

B. 

C. 

D. 

Answer: C



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18. The predominant form of histamine present in human blood is (pK_a , Histidine = 6.0) -

A. 

B. 

C. 

D. 

Answer: D



View Text Solution

19. Glucose on prolonged heating with HI gives-

- A. n-hexane
- B. 1-hexene
- C. hexanoic acid
- D. 6-iodohexanal

Answer: A



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20. Which one of the following sets of monosaccharides form sucrose-

A. $\beta - D -$ glucopyranose and $\alpha - D -$ fructofuranose

B. $\beta - D$ -glucopyranose and $\beta - D -$ fructofuranose

C. $\alpha - D -$ glucopyranose and $\alpha - D$ -fructofuranose

D. $\alpha - D -$ glucopyranose and $\beta - D -$ fructofuranose

Answer: D



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21. Which of the following hormones is produced under the condition of stress which stimulates glycogenolysis in the liver of human beings-

A. thyroxin

B. insulin

C. adrenaline

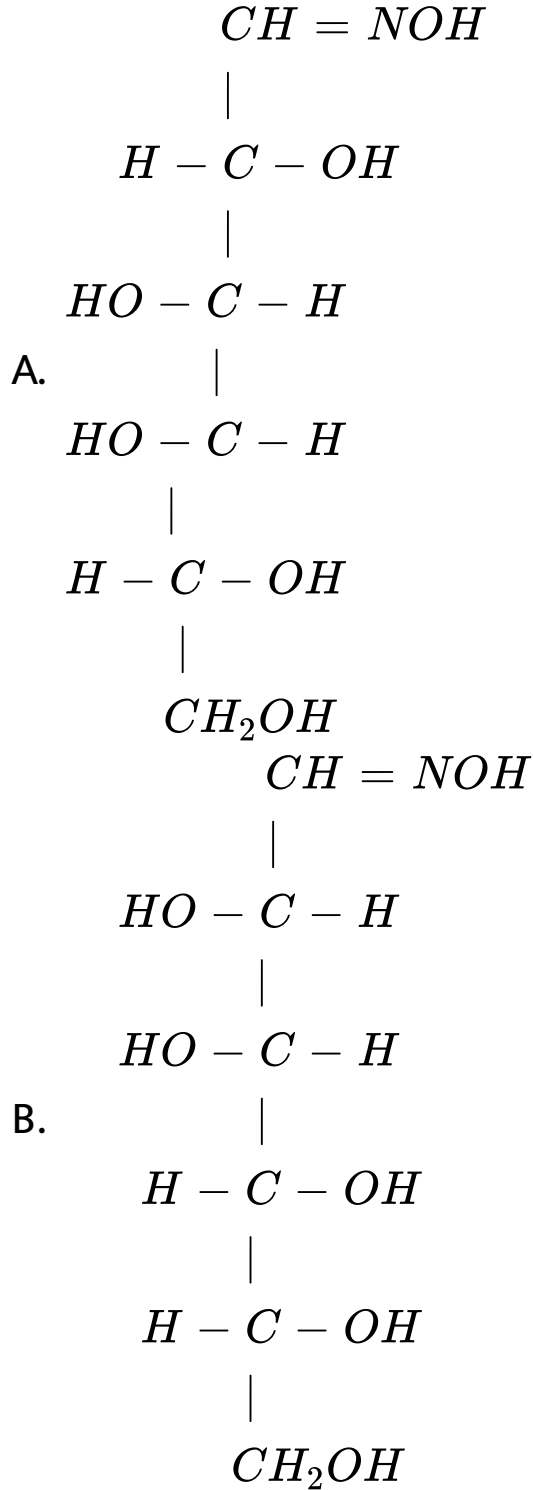
D. estradiol

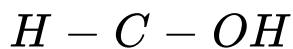
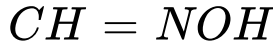
Answer: C



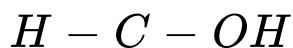
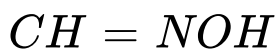
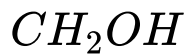
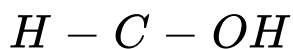
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22. $D - (+) -$ glucose reacts with hydroxylamine and yields an oxime. The structure of the oxime would be-

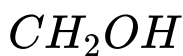
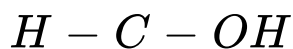
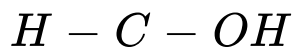




C.



D.



Answer: D



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23. In a protein molecule various amino acids are linked together by-

- A. dative bonds
- B. α -glycosidic bond
- C. β – glycosidic bond
- D. peptide bond

Answer: D



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24. Which one given below is a non-reducing sugar-

A. sucrose

B. maltose

C. lactose

D. glucose

Answer: A



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25. The correct statement regarding RNA and DNA, respectively is-

A. the sugar component in RNA is 2-deoxyribose and the sugar component in DNA is arabinose

B. the sugar component in RNA is arabinose and the sugar component in DNA is 2-deoxyribose

C. the sugar component in RNA is ribose and the sugar component in DNA is 2-

deoxyribose

D. the sugar component in RNA is arabinose
and the sugar component in DNA is ribose

Answer: C



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26. The central dogma of molecular genetics states that the genetic information flows from-

A. DNA \rightarrow RNA \rightarrow carbohydrates

B. Amino acids \rightarrow proteins \rightarrow DNA

C. DNA \rightarrow carbohydrates \rightarrow proteins

D. DNA \rightarrow RNA \rightarrow proteins

Answer: D



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27. The correct corresponding order of names of four aldoses with configurations given below respectively, is-



A. D-erythrose, D-threose, L-erythrose, L-threose

B. L-erythrose, L-threose, L-erythrose, D-threose

C. D-threose, D-erythrose, L-threose, L-erythrose

D. L-erythrose, L-threose, D-erythrose, D-threose

Answer: A



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28. 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 human body

Answer: C



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29. The difference between amylose and amylopectin is-

A. amylopectin has $1 \rightarrow 4\alpha$ -linkage and

$1 - 6\alpha$ -linkage

B. amylose has $1 \rightarrow 4\alpha$ -linkage and $1 - 6\beta$ -

linkage

C. amylopectin has $1 \rightarrow 4\alpha$ -linkage and
 $1 \rightarrow 6\beta$ -linkage

D. amylose is made up of glucose and
galactose

Answer: A



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30. Find the hydrolysis product of maltose-

A. $\alpha - D -$ glucose + $\alpha - D -$ glucose

B. $\alpha - D - \text{glucose} + \alpha - D - \text{fructose}$

C. $\alpha - D - \text{glucose} + \alpha - D - \text{galactose}$

D. $\alpha - D - \text{fructose} + \alpha - D - \text{galactose}$

Answer: A



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31. Find the hydrolysis product when a phosphodiester bond of nucleotide breaks-

A. $3 - OH\text{-deoxyribose} - 5 - PO_4^{3-}$

B. $5\text{-OH -dexoyribose} - 3 - PO_4^{3-}$

C. 2-OH- dexoyribose-2- PO_4^{3-}

D. 4-OH-dexoyribose-2- PO_4^{3-}

Answer: A



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32. Which of the following is a non-reducing sugar-

A. sucrose

B. maltose

C. lactose

D. mannose

Answer: A



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33. Maltose is made of the units-

A. $\alpha - D -$ glucos and $\beta - D -$ glucose

B. $\alpha - D -$ glucos and $\beta - D -$ fructose

C. $\alpha - D -$ glucos and $\beta - D -$ glucose

D. $\alpha - D -$ glucos and $\beta - D -$ galactose

Answer: C



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34. Lysine is least soluble in water in the pH range-

A. 3 to 4

B. 5 to 6

C. 6 to 7

D. 8 to 9

Answer: D



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35. Thymine is-

A. 5-methyluracil

B. 4-methyluracil

C. 3-methyluracil

D. 1-methyluracil

Answer: A



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36. Tocopherol' is the chemical name of-

A. vitamin K

B. vitamin E

C. vitamin H

D. vitamin D

Answer: B



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37. Glucose \xrightarrow{HCN} (X) $\xrightarrow{\text{hydrolysis}}$ (Y) $\xrightarrow[\Delta]{HI}$ (A) A is-

A. heptanoic acid

B. 2-iodohexane


C. heptane

D. heptanol

Answer: A



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38.  Arrange X,Y and Z in order of increasing acidic strengths-

A. $X > Z > Y$

B. $Z < X > Y$

C. $X > Y > Z$

D. $Z > X > Y$

Answer: A



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39. Which of the following statements is incorrect-

A. amylopectin is insoluble in water

B. fructose is reducing sugar

C. cellulose is the polymer of D-glucose

D. D-ribose sugar is present in DNA

Answer: D



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40. Which of the following sets of amino acids contains only essential amino acids-

A. histidine, glutamic acid and cysteine

B. arginine, lysine and histidine

C. tyrosine, asparagine and proline

D. valine, glutamine and isoleucine

Answer: B



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Solved Ncert Exemplar Problems

1. Glycogen is a branched chain polymer of $\alpha - D -$ 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

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 (can sugar) is a diaccharide. One molecule of sucrose on hydrolysis gives _____

A. 2 molecules of glucose

B. 2 molecules of glucose + 1 molecule of fructose

C. 1 molecule 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 structure 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 statement 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 is 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 structures of monosaccharides are given below. Which of these are anomers-



- 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. 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



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



18. 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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19. 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

Answer: B::D



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20. Proteins can be classified into two types on the basis of their molecular shape, i.e., fibrous

proteins and globular proteins. Examples of globular proteins are-

A. insulin

B. keratin

C. albumin

D. myosin

Answer: A::C



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21. Which of the following carbohydrates are branched polymer of glucose-

A. amylose

B. amylopectin

C. cellulose

D. glycogen

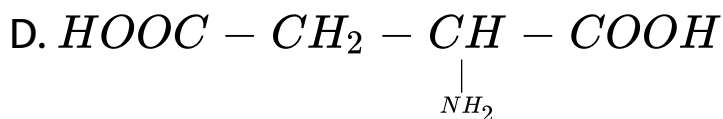
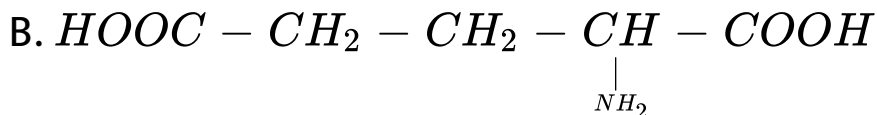
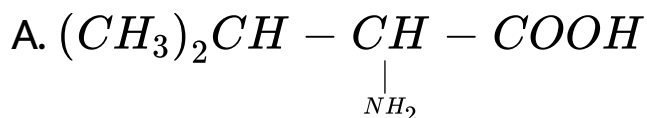
Answer: B::D



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22. 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-



Answer: B::D



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23. Lysine, $H_2N - (CH_2)_2 - \underset{\substack{| \\ NH_2}}{CH} - COOH$ is

- A. α -amino acid
- B. basic amino acid
- C. amino acid synthesised in body
- D. β -amino acid

Answer: A::B



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24. Which of the following monosaccharides are present as five membered cyclic structure (furanose structure) -

A. ribose

B. glucose

C. fructose

D. galactose

Answer: A::C



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25. In fibrous proteins, polypeptide chains are held together by_____



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26. Which of the following are purine bases-

A. guanine

B. adenine

C. thymine

D. uracil

Answer: A::B



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27. Which of the following terms are correct about enzyme

A. proteins

B. dinucleotides

C. nucleic acids

D. biocatalysts

Answer: A::D



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



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29. How do you explain the presence of all the six carbon atoms in glucose in a straight chain?



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30. In nucleoside a base is attached at 1' position of sugar moiety. Nucleotide is formed by linking of phosphoric acid unit to the sugar unit of nucleoside. At which position of sugar unit is the phosphoric acid linked in a nucleoside to give a nucleotide?



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31. Name the linkage connecting monosaccharide units in polysaccharides.



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32. Under what conditions glucose is converted to gluconic and saccharic acid?



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33. Monosaccharides contain carbonyl group hence are classified, as aldose or ketose. The number of carbon atoms present in the monosaccharide molecule are also considered for classification. In which class of monosaccharide will you place fructose?



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34. The letters 'D' or 'L' before the name of a stereoisomer of a compound indicate the correlation of configuration of that particular stereoisomer. This refers to their relation with one of the isomers of glyceraldehyde. Predict whether the following compound has 'D' or 'L' configuration.

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35. Aldopentoses named as ribose and 2-deoxyribose are found in nucleic acids. What is their relative configuration?



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36. Which sugar is called invert sugar? Why is it called so?



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37. Amino acids can be classified as $\alpha -$, $\beta -$, $\gamma -$, $\delta -$ and so on depending upon the relative position of amino group with respect to carboxyl group. Which type of amino acids form polypeptide chain in proteins?



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38. $\alpha -$ Helix is a secondary structure of proteins formed by twisting of polypeptide chain into right handed screw like structures. Which type of

interactions are responsible for making the α -helix structure stable?



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39. Some enzymes are named after the reaction, where they are used. What name is given to the class of enzymes which catalyse the oxidation of one substrate with simultaneous reduction of another substrate.



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40. During curdling of milk, what happens to sugar present in it?



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41. How do you explain the presence of five – OH groups in glucose molecule?



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42. Why does compound (A) given below not form an oxime?



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



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44. Sucrose is dextrorotatory but mixture obtained after hydrolysis is laevorotatory. Explain



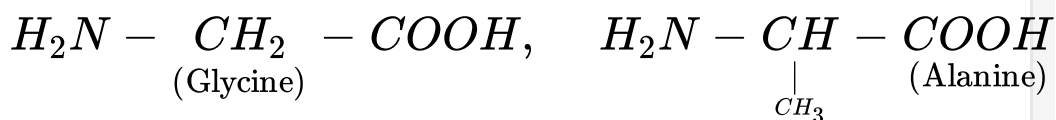
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45. Amino acids behave like salts rather than simple amines or carboxylic acids. Explain



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46. Structures of glycine and alanine are given below. Show the peptide linkage in glycylalanine



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47. Protein found in a biological system with a unique three-dimensional structure and biological activity is called a native protein. When a protein in its native form, is subjected to a physical change like change in temperature or a chemical change like, change in pH, denaturation of protein takes place. Explain the cause.



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48. Activation energy for the acid catalysed hydrolysis of sucrose is $6.22\text{kJ} - \text{mol}^{-1}$, while

the activation energy is only $2.15\text{kJ} - \text{mol}^{-1}$ when hydrolysis is catalysed by the enzyme sucrase. Explain.



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49. How do you explain the presence of an aldehydic group in a glucose molecule?



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50. Which moieties of nucleosides are involved in the formation of phosphodiester linkages present

in dinucleotides? What does the word diester in the name of linkage indicate? Which acid is involved in the formation of this linkage?



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51. What are glycosidic linkages? In which type of biomolecules are they present?



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52. Which monosaccharide units are present in starch, cellulose and glycogen and which linkages

link these units?



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53. How do enzymes help a substrate to be attacked by the reagent effectively?



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54. Describe the term D- and L- configuration used for amino acids with examples.



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55. How will you distinguish 1° and 2° hydroxyl groups present in glucose? Explain with reactions



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56. Coagulation of egg white on boiling is an example of denaturaton of protein. Explain it in terms of structural changes.



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57. In the following questions a statement of Assertion (A) followed by a statement of Reason (R) is give. Choose the correct answer out of the following choices.

Assertion (A): $D(+)$ – glucose is dextrorotatory in nature

Reason (R): 'D' represents its dextrorotatory nature.

A. (A) and (R) both are correct statement and

(R) is correct explanation for (A)

- B. (A) and (R) both are correct statements but (R) is not correct explanation for (A)
- C. (A) is correct statement but (R) is wrong statement.
- D. (A) and (R) both are incorrect statements

Answer: C



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58. In the following questions a statement of Assertion (A) followed by a statement of Reason

(R) is give. Choose the correct answer out of the following choices.

Assertion (A): Vitamin D can be stored in our body.

Reason (R): Vitamin D is fat soluble vitamin.

A. (A) and (R) both are correct statement and

(R) is correct explanation for (A)

B. (A) and (R) both are correct statements but

(R) is not correct explanation for (A)

C. (A) is correct statement but (R) is wrong statement.

D. (A) and (R) both are incorrect statements

Answer: A



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59. In the following questions a statement of Assertion (A) followed by a statement of Reason (R) is give. Choose the correct answer out of the following choices.

Assertion (A): β -glycosidic linkage is present in maltose.



Reason (R): Maltose is composed of two glucose units in which C – 1 of one glucose unit is linked to C-4 of another glucose unit

A. (A) and (R) both are correct statement and (R) is correct explanation for (A)

B. (A) and (R) both are correct statements but (R) is not correct explanation for (A)

C. (A) is correct statement but (R) is wrong statement.

D. (A) and (R) both are incorrect statements

Answer: D



60. In the following questions a statement of Assertion (A) followed by a statement of Reason (R) is give. Choose the correct answer out of the following choices.

Assertion (A): All naturally occurring α -amino acids except glycine are optically active

Reason (R): Most naturally occuring amino acids have L-configuration.

A. (A) and (R) both are correct statement and

(R) is correct explanation for (A)

- B. (A) and (R) both are correct statements but (R) is not correct explanation for (A)
- C. (A) is correct statement but (R) is wrong statement.
- D. (A) is wrong statement but (R) is correct statement

Answer: D



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61. In the following questions a statement of Assertion (A) followed by a statement of Reason (R) is give. Choose the correct answer out of the following choices.

Assertion (A): Deoxyribose, $C_5H_{10}O_4$ is not a carbohydrate.

Reason (R): Carbohydrates are hydrates of carbon so compounds which follow $C_x(H_2O)_y$ formula are carbohydrates.

A. (A) and (R) both are correct statement and

(R) is correct explanation for (A)

- B. (A) and (R) both are correct statements but (R) is not correct explanation for (A)
- C. (A) is correct statement but (R) is wrong statement.
- D. (A) and (R) both are incorrect statements

Answer: D



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62. In the following questions a statement of Assertion (A) followed by a statement of Reason (R)

is give. Choose the correct answer out of the following choices.

Assertion (A):

- A. (A) and (R) both are correct statement and (R) is correct explanation for (A)
- B. (A) and (R) both are correct statements but (R) is not correct explanation for (A)
- C. (A) is correct statement but (R) is wrong statement.
- D. (A) and (R) both are incorrect statements

Answer: B



63. In the following questions a statement of Assertion (A) followed by a statement of Reason (R) is give. Choose the correct answer out of the following choices.

Assertion (A):

A. (A) and (R) both are correct statement and

(R) is correct explanation for (A)

B. (A) and (R) both are correct statements but

(R) is not correct explanation for (A)

C. (A) is correct statement but (R) is wrong statement.

D. (A) and (R) both are incorrect statements

Answer: A



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64. Enumerate the reactions of D-glucose which cannot be explained by its open chain structure.



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65. On the basis of which evidences D-glucose was assigned the following structure ?



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66. Carbohydrates are essential for life in both plants and animals. Name the carbohydrates used as storage molecules in plants and animals, also name the carbohydrate present in wood or fibre of cotton cloth



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67. Explain the terms primary and secondary structure of proteins. What is the difference between α -helix and β -pleated sheet structure of proteins?



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68. Write the structures of fragments produced on complete hydrolysis of DNA. How are they linked in DNA molecule? Draw a diagram to show pairing of nucleotide bases in double helix of DNA.



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Mcq Hotspot

1. Name of the protein which is responsible for gout is

- A. ribose unit
- B. nitrogenous base
- C. phosphate
- D. none of the above

Answer: D



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2. Which one of the following is a globular protein-

A. collagen

B. myoglobin

C. myosin

D. fibroin

Answer: B



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3. The end product of protein metabolism is-

- A. peptide
- B. peptone
- C. proton
- D. α -amino acid

Answer: D



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4. Complete hydrolysis of cellulose yields-

A. D-fructose

B. D-ribose

C. D-glucose

D. L-glucose

Answer: C



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5. Which one of the following is non-reducing sugar-

A. glucose

B. fructose

C. lactose

D. sucrose

Answer: D



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6. Which compound does not exhibit mutarotation-

A. sucrose

B. D-glucose

C. L-lactose

D. none

Answer: A



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7. Participating group in disulphide bond of protein is-

A. thioether

B. thioester

C. thiol

D. thiolactone

Answer: C



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8. The sequence in a nucleotide of nucleic acid is-

- A. phosphate-base
- B. sugar-base-phosphate
- C. base-sugar-phosphat
- D. base-phosphate-sugar

Answer: B



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9. Which chemical compounds acts as an emulsifier-

A. phosphoric acid

B. fatty acid

C. bile acids

D. mineral acids

Answer: C



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10. The sequence in which amino acids are arranged in a protein molecule refers to its-

- A. primary structure
- B. secondary structure
- C. tertiary structure
- D. quaternary structure

Answer: A



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11. Stability is imparted to the protein helix by-

A. dipeptide bond

B. hydrogen bond

C. ether bond

D. peptide bond

Answer: B



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12. The monomeric unit of starch is-

- A. glucose
- B. fructose
- C. glucose and fructose
- D. mannose

Answer: A



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13. Which of the following responds to Molisch's reagent-

- A. all carbohydrates

B. sucrose

C. fructose

D. glucose

Answer: A



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14. Carboxylic acid and amino groups of an amino acid are ionised at $pK_{a_1} = 2.34$ and $pK_{a_2} = 9.60$. The pH at which the amino acid will attain its isoelectric point is-

A. 5.97

B. 2.34

C. 9.60

D. 6.97

Answer: A



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15. The percentage of $\alpha - D$ -glucose and $\beta - D$ - glucose in D-glucose is

A. 0.5

B. 64% and 36%

C. 36% and 64%

D. 33% each along with open chain structure

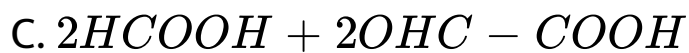
Answer: C



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16. Glucaric acid $[HOOC(CHOH)_4COOH]$ on the reaction with HIO_4 produces-





Answer: C



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17. Which amino acid does not contain any chiral carbon-

A. histidine

B. glycine

C. α - alanine

D. threonine

Answer: B



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18. Which responds to Benedict's reagent but not to ninhydrin-

A. protein

B. monosaccharide

C. lipid

D. amino acid

Answer: B



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19. Hydrolytic reaction of sucrose is called-

A. inhibition

B. inversion

C. saponification

D. hydration

Answer: B



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20. Which structural characteristic distinguishes proline from other amino acids-

- A. optical inactivity
- B. presence of aromatic group
- C. presence of two hydroxylic group
- D. it is secondary amine group

Answer: D



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21. A compound ($C_6H_{12}O_6$) on reaction with phenyl-hydrazine gives a yellow ppt. and with Na produces a mixture of sorbitol and mannitol. The compound is-

A. fructose

B. glucose

C. mannose

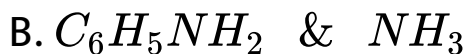
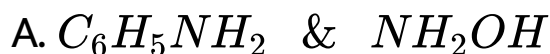
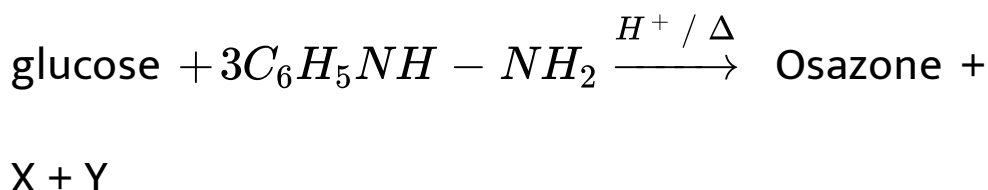
D. sucrose

Answer: A



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22. Compounds X and Y obtained in the following reaction are-



Answer: 3



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23. Which of the following hexoses form the same osazones on reaction with phenylhydrazine-

- A. D-glucose, D-galactose and D-talose
- B. D-fructose, D-mannose and D-galactose
- C. D-glucose, D-mannose and D-galactose
- D. D-glucose, D-mannose and D-fructose

Answer: D



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24. The least solubility of amino acids in water is at-

A. $pH = 7$

B. $pH > 7$

C. $pH < 7$

D. pI

Answer: D



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25. Protein \xrightarrow{P} Polypeptide \xrightarrow{Q} Amino acid. P

and Q are-

A. invertase and zymase

B. amylase and maltase

C. diastase and lipase

D. pepsin and trypsin

Answer: B



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26. The positions at which base and phosphate groups are linked in DNA and RNA are-

A. C'_5 and C'_2

B. C'_2 and C'_5

C. C'_1 and C'_5

D. C'_5 and C'_1

Answer: C



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27. Which one of the given is $C - 2$ epimer of D-glucose-

A. D-galactose

B. L-glucose

C. D-mannose

D. D-fructose

Answer: C



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28. Which one of the following is a zwitterion-

- A. urea
- B. glycine hydrochloride
- C. ammonium acetate
- D. L-alanine

Answer: D



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29. The hydrolytic product of sucrose is-

A. galactose

B. glucose

C. fructose

D. ribose

Answer: B::C



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30. Which compound shows mutarotation-

A. glucose

B. fructose

C. sucrose

D. starch

Answer: A::B



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31. Which amino acid is chiral-

A. alanine

B. glycine

C. phenylalanine

D. glutamine

Answer: A::C



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32. Which compound possesses a transitional element-

A. vitamin B_{12}

B. chlorophyll

C. haemoglobin

D. DNA

Answer: A::C



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33. Globular protein is absent in-

A. blood

B. keratin

C. egg

D. muscles

Answer: B::D



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34. Which of the given statements is true-

A. amino acid contains amino group & carboxylic group

B. amino acids are the structural components of peptide and protein

C. amino acids exist as zwitterions

D. amino acids are negatively charged in alkaline medium

Answer: A::B::C::D



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Exercise

1. Why are naturally occurring glucose and fructose called dextrose and laevulose respectively?



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2. Explain the role of osazone structure in identifying monosaccharides.



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3. Name the enantiomer of α -D-(+)-glucose.



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4. Which amino acid is not optically active?



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5. What idea can be obtained about the structure of monosaccharides from mutarotation?



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6. Which two compounds combine to produce invert sugar?



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7. Name the disaccharide present in milk.



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8. How many molecules of phenylhydrazine react with glucose to present osazone?



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9. Name the closed ring structure in glucose.



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10. Name a sulphur-containing amino acid.



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11. Name the monomers of DNA and RNA.



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12. Name the hydrolytic product of cellulose.



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13. Differentiate between amylose and amylopectin.



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14. Why human beings cannot digest cellulose?



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15. Which class of organic compounds does enzyme belong to?



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16. State an important characteristic of enzyme as catalyst.



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17. Which vitamin deficiency causes pernicious anaemia?



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18. Which enzyme decoagulates clotted blood?



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19. How many α -amino acid molecules are found in one insulin molecule?



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20. State the role of insulin in human body.



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21. Which enzyme converts glucose into ethanol?



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22. Show the structures of sugars present in DNA and RNA.



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23. Define coenzyme. Give example.



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24. Which vitamin deficiency causes beriberi and joint pains?



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25. Polysaccharides mix in boiling water to form _____.



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26. An increase in temperature _____ the mutarotation rate.



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27. The simplest amino acid is _____.



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28. Sucrose hydrolysis is called _____.



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29. The heterocyclic bases present in nucleic acids are called _____.



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30. Polyhydroxy ketones are known as ____.



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31. Amylopectin is a branched polymer of ____.



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32. Phospholipids are mixed glycerides of ____
and ____.



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33. Thyroxine is a ____ hormone.



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34. Scurvy disease occurs due to deficiency of ____.



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35. The chemical name of vitamin B_{12} is ____.



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36. Lecithin is a _____.



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37. The acidic property of glycine pertains to _____.



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38. The power-house of animal cell is called _____.



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39. Why does glucose show mutarotation?



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40. Justify the formation of zwitterion of α -amino acid.



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41. What do you mean by N-terminal and C-terminal amino acid?



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42. Give two structural and functional differences between DNA and RNA.



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43. Distinguish between nucleoside and nucleotide with examples.



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44. Define nucleic acid. State its role in replication.



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45. State the essential biological activities of protein.



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46. Define hormone. State biological role of insulin and testosterone.



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47. Define glycosidic bond. Explain it with the help of an example.



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48. Discuss about the double stranded structure of DNA.



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49. Define disaccharides. Draw the structures of two disaccharides.



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50. State the major differences between fibrous & globular proteins.



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51. What do you mean by inversion of sucrose and invert sugar?



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52. Discuss about the water-soluble and water-insoluble components of starch.



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53. Explain why hormone is called chemical messenger.



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Additional Questions

1. Glucose is oxidised by bromine water



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2. Glucose is reduced by red P/HI



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3. Glucose is made to react with HNO_3



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4. Glucose is treated with hydroxylamine



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5. Glucose is reacted with excess of phenylhydrazine



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6. Glucose is reduced by sodium-amalgam



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7. Reducing and non-reducing sugars



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8. Formation of zwitterion in amino acids



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9. Isoelectric point



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10. what are Nucleoside and nucleotide?



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11. Transform into

Aldopentose \rightarrow Aldohexose



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12. Aldohexose \rightarrow Aldopentose



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Practic Set 14

1. Hydrolytic reaction of sucrose is called-

A. inhibition

B. inversion

C. saponification

D. hydration

Answer:



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Practic Set 15

1. Which amino acid does not contain any chiral carbon-

A. valine

B. glycine

C. threonine

D. alanine

Answer:



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Practic Set 16

1. The percentage of $\alpha - D -$ glucose and $\beta - D -$ glucose is-

A. 50% and 50%

B. 64% and 36%

C. 36% and 64%

D. 60% and 40%

Answer:



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Practic Set 17

1. The least solubility of amino acids in water is at-

A. $pH = 7$

B. $pH > 7$

C. $pH < 7$

D. pI

Answer:



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Practic Set 18

1. Which of the following vitamins is soluble in water-

A. vitamin C

B. vitamin D

C. vitamin E

D. vitamin K

Answer:



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Practic Set 19

1. What is the effect of denaturation on the structure of proteins?



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Practic Set 20

1. What are the different types of RNA found in the cell?



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Practic Set 21

1. How does globular protein differ from fibrous protein?



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Practic Set 22

1. What happen when bromine water is added in D-glucose?



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Practic Set 24

1. Which transition metal is present in vitamin B_{12} ?



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Practic Set 25

1. What do you mean by DNA fingerprint?



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Practic Set 26

1. How many hydrogen bonds are formed between adenine and thymine?



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Practic Set 27

1. What is mutarotation?



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Practic Set 28

1. The two strands in DNA are not identical but are complementary. Explain?



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Practic Set 29

1. Write down the structure of tripeptide Gly-Ala-Val.



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