



CHEMISTRY

BOOKS - A N EXCEL PUBLICATION

BIOMOLECULES

Question Bank

1. Glucose and 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 pentaacetate of D-glucose ?



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4. The melting points and solubility in water of amino acids are higher than those 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 suggested about the structure of RNA ?



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





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10. Carbohydrates are classified into three major classes : monosaccharide, oligosaccharide and polysaccharides. What are polysaccharide ?



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11. Carbohydrates are classified into three major classes : monosaccharide,

oligosaccharide and polysaccharides. Give two examples of polysaccharide.



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12. Carbohydrates are classified into three major classes : monosaccharide, oligosaccharide and polysaccharides. What is inverted sugar ?



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13. Glucose is a monosaccharide which can be oxidised, reduced and acetylated. What happen when a glucose is treated with Br_2 water



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14. Glucose is a monosaccharide which can be oxidised, reduced and acetylated. What happen when a glucose is treated with $HI/redP$.





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15. Glucose is a monosaccharide which can be oxidised, reduced and acetylated. What happen when a glucose is treated with acetic anhydride



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16. Name of some carbohydrates, their properties and structural patterns are given

below. Match them properly

Glucose

Sucrose

Lactose

Amylopectin

Disaccharide

Reducing

Insoluble in water

Non-reducing

Trisaccharide

Monosaccharide

1, 4 - link

Galactoxide

1, 6 - linkage

Fructoxide

Anomers present

2 glucose units linked



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17. Proteins have polypeptide bonds. What are polypeptides ?



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18. Proteins are the polymers of α - amino acids. The structure and shape of proteins can be discussed at four different levels - namely primary, secondary, tertiary and quaternary

Give an account of structure and shape of proteins considering the above levels.



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19. Carbohydrates are classified into monosaccharide, oligosaccharides and

polysaccharides. What is the basic of such classification ?



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20. Carbohydrates are classified into monosaccharides, oligosaccharides and polysaccharides. Give an example of an oligosaccharide?



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21. Vitamin C is a vitamin found in fruits and vegetables. It cannot be stored in our body.

Why ?



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22. Proteins are important polymers of biological system. What is denaturation of proteins ?



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23. Proteins are important polymers of biological system. Give two example of denaturation.



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24. Amino acids can be classified into essential and non-essential amino acids. What is the basis of such classification ?



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25. Amino acids can be classified into essential and non-essential amino acids. Write one example each for essential amino acid.



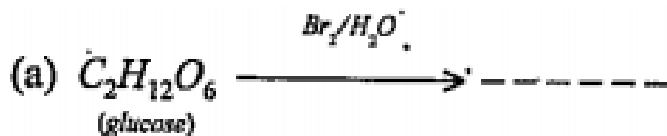
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26. Write any two differences between DNA and RNA.



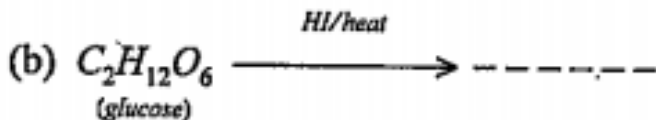
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27. Name the products obtained in the following reaction



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28. Name the products obtained in the following reaction



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29. Carbohydrates are classified into three major classes : monosaccharide, oligosaccharide and polysaccharides. What is inverted sugar ?



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30. Carbohydrates are classified into three major classes : monosaccharide,

oligosaccharide and polysaccharides. Give two examples of polysaccharide.



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31. Biomolecules are formed by certain specific linkages between simple monomeric units. Write the names of linkages and monomeric units in the starch class of biomolecules.



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32. Biomolecules are formed by certain specific linkages between simple monomeric units. Write the names of linkages and monomeric units in the protein class of biomolecules.



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33. Biomolecules are formed by certain specific linkages between simple monomeric units. Write the name of linkages and monomeric units in the Nucleic acid class of biomolecules.





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34. Name a fat soluble vitamin, Suggest a diseases caused by its deficiency.



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35. What do you mean by the secondary structure of proteins?



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36. What do you mean by the Nucleosides ?



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37. Carbohydrates are classified into monosaccharides, oligosaccharides and polysaccharides. Give an example of an oligosaccharide?



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38. Write any one method for preparation of glucose.



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39. What is peptide linkage ?



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40. Match the following structures of protein in column I with their characteristic features in

column II

Column I

- (i) Primary structure
- (ii) Secondary structure
- (iii) Tertiary structure
- (iv) Quaternary structure

Column II

- (a) Spatial arrangement of polypeptide sub units
- (b) Structure of amino acids
- (c) Folding of peptide chains
- (d) Sequence of amino acids
- (e) Fibrous or globular nature



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41. What is denaturation ?



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42. Cane sugar, Glucose and Starch are Carbohydrates. Represent the structure of

glucose.



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43. Write a method to prepare Glucose from starch. Write the chemical equation of the reaction.



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44. Suggest any two uses of carbohydrates.



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45. What is denaturation ?



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46. Match the following

Match the following:

Vitamin A

Starch

Aldohexose

Enzyme

Glucose

Zymase

Night blindness

Amylose

Fructose



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47. Which of the following is a polysaccharide

? Maltose, Sucrose, Fructose, Cellulose

A. Maltose

B. Sucrose

C. Fructose

D. Cellulose

Answer: D



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48. Explain the amphoteric behavior of amino acid.



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49. $\alpha - D - (+)$ glucose and $\beta - D - (+)$ glucose are:- Metameres, Anomers, Geometrical isomers, Functional group isomers

A. Metameres

B. Anomers

C. Geometrical isomers

D. Functional group isomers

Answer: B



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50. What is denaturation of proteins ?



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51. Differentiate between nucleoside and nucleotide:



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52. Glucose has a cyclic hemiacetal ring structure known as pyranose structure. Give two observations or properties of glucose that can be explained only by the ring structure.



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53. Glucose has a cyclic hemiacetal ring structure known as pyranose structure. What are anomers ?



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54. Disaccharides give two molecules of the same or different monosaccharide on hydrolysis. Give the name of a disaccharide that gives only one type of monosaccharide on hydrolysis.



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55. Disaccharides give two molecules of the same or different monosaccharide on hydrolysis. What do you understand by the term glycosidic linkage ?



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56. Disaccharides give two molecules of the same or different monosaccharide on

hydrolysis. Why is sucrose a non-reducing sugar ?



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57. Disaccharides give two molecules of the same or different monosaccharide on hydrolysis. Why is the hydrolysis of sucrose known as inversion of sugar ?



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58. Proteins are made up of α - amino acids. They are actually polypeptides having high molecular mass. Name an optically inactive α - amino acid found in proteins.



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59. Proteins are made up of α - amino acids. They are actually polypeptides having high molecular mass. Give one example each for neutral, acidic and basic α - amino acids.





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60. Proteins are made up of α - amino acids. They are actually polypeptides having high molecular mass. How do amino acids exist as zwitterion ?



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61. Vitamins are organic compounds required in the diet in small amounts to perform

specific biological functions Which vitamin is synthesised in the body ?



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62. Vitamin C is a vitamin found in fruits and vegetables. It cannot be stored in our body. Why ?



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63. Vitamins are organic compounds required in the diet in small amounts to perform specific biological functions. The deficiency of which vitamins increases the time for blood clotting ?



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64. Vitamins are organic compounds required in the diet in small amounts to perform

specific biological functions. Which diseases is caused by the deficiency of vitamin B_{12} ?



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65. D-glucose is obtained in two different forms, α -D- glucose and β -D- glucose, depending on how we crystallise it. What are α and β forms of glucose known as ?



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66. D-glucose is obtained in two different forms, α -D- glucose and β -D- glucose, depending on how we crystallise it. How do these forms differ in their configuration ?



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67. D-glucose is obtained in two different forms, α -D- glucose and β -D- glucose, depending on how we crystallise it. Represent the structure of $\alpha - D$ glucose.





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68. All naturally occurring sugars are found to have the D-configuration. How do you assign D or L configuration for a monosaccharide ? Illustrate with a specific example.



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69. All naturally occurring sugars are found to have the D-configuration. Give a reaction to

prove that glucose contain five hydroxyl groups.



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70. All naturally occurring sugars are found to have the D-configuration. How does glucose react with hydroxylamine ? Give equation.



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71. Proteins are essential for growth in animals. What are the common types of secondary structures of proteins ?



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72. Proteins are essential for growth in animals. Which class of proteins are enzymes ?



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73. Proteins are essential for growth in animals. Differentiate between globular and fibrous proteins.



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