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India's Number 1 Education App

CHEMISTRY

BOOKS - KALYANI CHEMISTRY (ENGLISH)

BIOMOLECULES

Intext Questions

1. In a solution of pH 11, will glycine exist as an anion or cation ?

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2. In a solution of pH 5, will glycine exist as a cation or anion ?

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3. The tertiary structure of many proteins dissolved in water is disrupted by heating above $80^{\circ} C$ but primary structure is unaffected. Explain.

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4. State the difference between α-helix and β-pleated sheet configuration

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5. What type of bonding occurs in (a) α-helix configuration (b) proteins and (c) β-sheet ?

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6. Living organisms are constantly in need of energy which they derive from food. Then why have we to eat only intermittently?

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7. A mixed diet of carbohydrates, fats and proteins is better than any of them separately. Why is it so?

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Exercise Part I Objective Questions Fill In The Blanks

1. A monosaccharide containing an aldehydic group is known as.....

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2. Oligosaccharises are the compounds which give ..... monosaccharide molecules on acidic hydrolysis.

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3. Sucrose is a .....sugar.

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4. Glucose is sometimes called.....sugar.

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5. Glucose contains..... 1° alcoholic group/groups and .... 2° alcoholic

group/groups.

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6. In what way do glucose and fructose differ?

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7. Vitamin C is soluble in.....

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8. Chemical name of vitamin B_{12} is.....

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9. Anaemia is caused by lack of ..... and iron.

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10. Vitamin A deficiency leads to disease known as.....

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11. Fructose is sometimes called ..... sugar.

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12. Structures which differ in configuration around C - 1 atom are called.....

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13. All naturally occurring amino acids possess ..... configuration.

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14. The amino acids which human body cannot synthesise are called ..... amino acid.

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15. The non-protein material present in a conjugated protein is called .....

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16. The purine bases present in nucleic acids are ..... and .....

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17. The pyridimidine bases present in RNA molecule are ..... and .....

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18. DNA sequence that acts as a code for a specific protein or polypeptide is called .....

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19. The sugar present in RNA is .. .. While the sugar present in DNA is .....

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20. Vitamins A, D, E, K are ..... soluble while vitamines of B-group (B-complex) and vitamin C are ..... soluble.

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21. Both DNA and RNA are polymers of basic repeating unit, called a .....

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22. Haemoglobin present in blood acts as .....

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23. The process by which a single DNA molecule produces two identical copies of itself during cell division is called .....

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24. Isoelectric point of glycine is .....

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25. An ATP molecule consists of a purine base ....., a pentose sugar and ..... interlinked phosphate units.

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26. Proteins are made up of ..... Units held together by .....

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27. ..... And ..... Are functional isomers.

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Exercise Part I Objective Questions The Correct Alternative From The Choices Given

1. Carbohydrates are compounds of

A. C,N,O

B. C, H,N

C. C,H,O

D. N, O, H

Answer: C

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2. A sugar solution with sugar molecules and water molecules

A. mutarotation

B. flocculation

C. inversion

D. optical rotation.

Answer: A

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3. The disaccharide present in milk is

A. Maltose

B. Ketose

C. Sucrose

D. Lactose

Answer: D

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4. Aldohexose in the following is

A. cellulose

B. glucose

C. fructose

D. lactose

Answer: B

5. Cellulose is

A. simple sugar

B. glycogen

C. carbohydrate

D. protein

Answer: C

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6. Lactose is a disaccharide of

A. glucose and fructose

B. glucose and glucose

C. glucose and galactose

D. glucose and maltose.

Answer: C

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7. Proteins when heated with conc. HNO_3 give a yellow colour. This is

A. oxidising test

B. xanthoprotein test

C. Hoppe's test

D. acid base test

Answer: B

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8. The incorrect statement about ribose is

A. It is a polyhydroxy compound

B. It is an aldehyde sugar

C. It has six carbon atoms

D. It exhibits optical activity

Answer: C

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9. In DNA, the complimentary bases are

A. uracil and adenine : cytosine and guanine

B. adenine and thymine: guanine and cytosine

C. adenine and thymine: guanine and uracil

D. adenine and guanine : thymine and cytosine.

Answer: B

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10. The acid showing salt-like character in aqueous solution is

A. acetic acid

B. benzoic acid

C. formic acid

D. c-Aminoacetic acid.

Answer: D

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11. Carbohydrate which is an essential constituent of plants cells is

A. Starch

B. Cellulose

C. Sucrose

D. Vitamins

Answer: B

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12. Amino acids are the building blocks of

A. Carbohydrates

B. Vitamins

C. Fats

D. Proteins

Answer: D

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13. The sweetest sugar is

A. Sucrose

B. Glucose

C. Fructose

D. Maltose

Answer: C

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14. Enzymes in the living systems

A. provide energy

B. provide immunity

C. transport oxygen

D. catalyse biological reactions.

Answer: D

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15. Which of the following is not correct about DNA?

A. It occurs in the cytoplasm of the cell.

B. The sugar present is 2-deoxy D(-) ribose.

C. It has a double strand a-helix.

D. It has property of replication.

Answer: A

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16. Glucose gives silver mirror test with Tollen's reagent. It shows the presence of

A. acidic group

B. alcoholic group

C. ketonic group

D. aldehyde group

Answer: D

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17. Iodine test is shown by

A. polypeptides

B. glycogen

C. starch

D. glucose

Answer: C

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18. α-D(+)-glucose and β-D(+) glucose are

A. anomers

B. enantiomers

C. geometrical isomers

D. epimers

Answer: A

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19. DNA contains the sugar

A. Deoxyribose

B. Ribose

C. D-fructose

D. D-glucose

Answer: A

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20. In polysaccharides, the linkage connecting monosaccharide units is called

A. glycoside linkage

B. nucleoside linkage

C. glycogen linkage

D. peptide linkage.

Answer: A

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21. Which of the following cannot distinguish between glucose and fructose ?

A. Tollen's reagent

B. Fehling solution

C. Benedict's solution

D. All of these.

Answer: D

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22. Select the vitamin whose deficiency causes night blindness

A. Vitamin K

B. Vitamin E

C. Vitamin A

D. Vitamin B_6

Answer: C

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23. Insulin is a

A. sugar

B. lipid

C. vitamin

D. hormone

Answer: D

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24. Thiamine is a

A. vitamin

B. purine

C. carbohydrate

D. pyrimidine

Answer: A

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25. Vitamin D is also known as

A. ascorbic acid

B. sunshine vitamin

C. reproductive vitamin

D. growth vitamin

Answer: B

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26. The best source of vitamin A is

A. wheat

B. carrots

C. oranges

D. beans

Answer: B

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27. The hormone which helps in the conversion of glucose into glycogen is

A. Insulin

B. Glucogen

C. Adrenaline

D. None of these.

Answer: A

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28. Glycogen is a branched chain polymer of α-D-glucose units in which chain is formed by C-1 - C-4 glycosidic linkage whereas branching linakge. Structure of glycogen is similar to _____ .

A. Amylose

B. Amylopectin

C. Cellulose

D. Glucose

Answer: B

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29. Which of the following polymers is stored in the liver of animals ?

A. Amylose

B. Cellulose

C. Amylopectin

D. Glycogen

Answer: D

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

A. 2 molecules of glucose

B. 2 molecules of glucose + 1 molecule of fructose

C. 1 molecule of glucose + 1 molecule of fructose

D. 2 molecules of fructose

Answer: C

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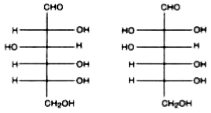
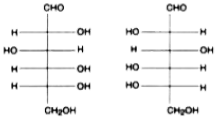
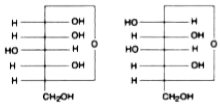
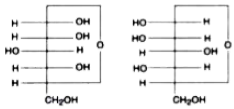
31. Which of the following pairs represents anomers ?

A. 

B. 

C. 

D. 

Answer: C

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

A. Peptide bonds

B. van der Waals' forces

C. Hydrogen bonds

D. Dipole-dipole interactions

Answer: C

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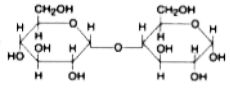
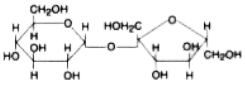
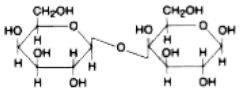
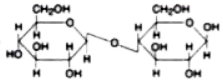
33. In disaccharides , if the reducing groups of monosaccharides i.e. aldehydic or ketonic groups are bonded, these are non-reducing sugars. Which of the following disaccharide is a non-reducing sugar ?

A. 

B. 

C. 

D. 

Answer: B

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34. 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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35. 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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36. Nucleic acids are the polymers of _____ .

A. Nucleosides

B. Nucleotides

C. Bases

D. Sugars

Answer: B

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37. 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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38. 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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39. DNA and RNA contain four bases each. Which of the following bases in not present in RNA?

A. Adenine

B. Uracil

C. Thymine

D. Cytosine

Answer: C

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

A. Vitamin B_1

B. Vtamin B_2

C. Vitamin B_6

D. Vitamin B_{12}

Answer: D

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41. Which one of the following bases is not present in DNA ?

A. Adenine

B. Thymine

C. Cytosine

D. Uracil

Answer: D

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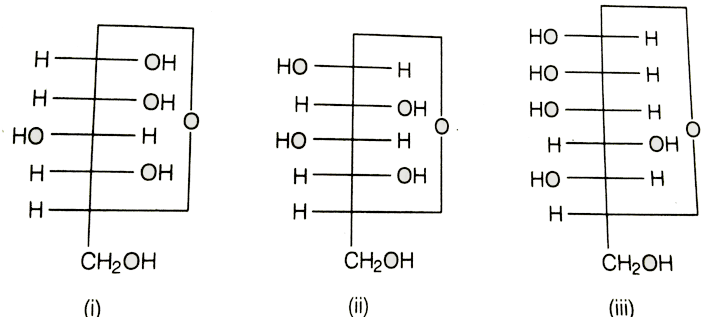
42. These cyclic structures of monosaccharides are given below which of these are anomers.



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

A. Glucose forms pentaacetate

B. Glucose reacts with hydroxylamine to form an oxime

C. Pentaacetate of glucose does not react with hydroxylamine

D. Glucose is oxidised by nitric acid to gluconic acid.

Answer: C

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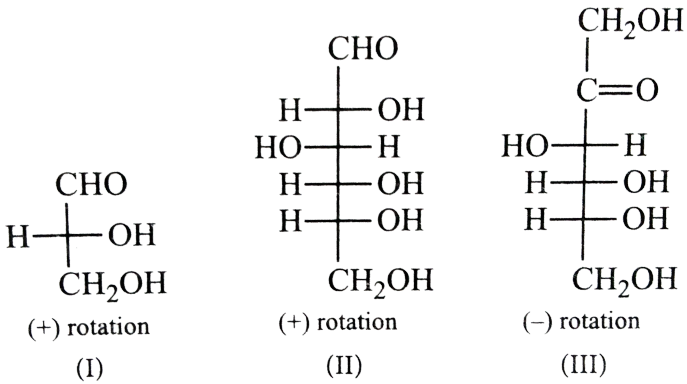
44. Optical rotations of some compounds along with their structures are given. Which of them have D-configuration?



A. I,II,III

B. II,III

C. I,II

D. III

Answer: A

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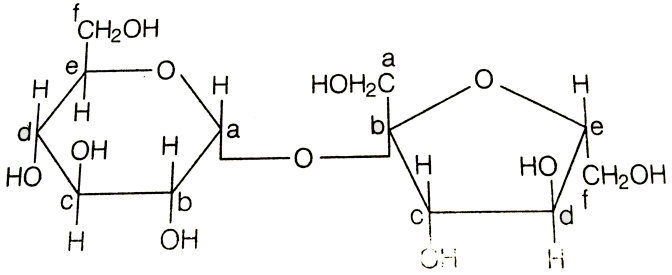
45. Structure of disaccharide formed by glucose and fructose is given below. Identify anomeric carbon atoms in monosaccharide units.



(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

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. of carbon of glucose and of carbon of fructose.

Answer: C

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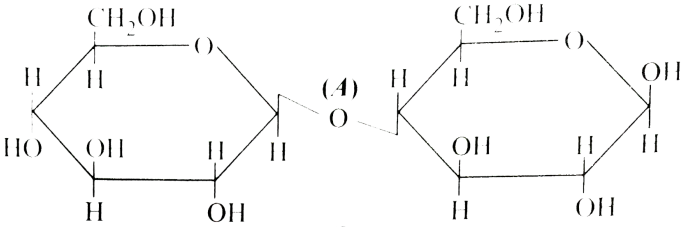
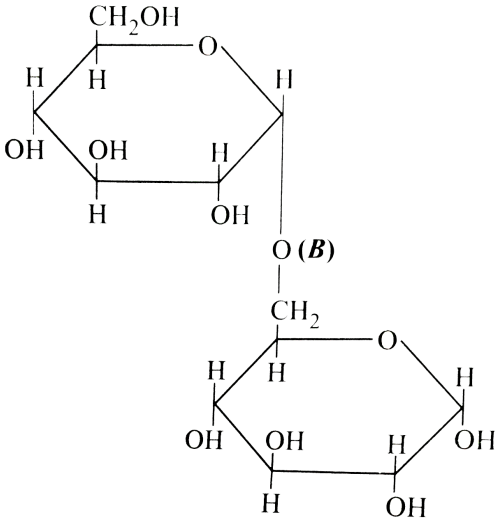
46. Three structures are given below in which two glucose units are linked. Which of these linkages between glucose units are between C-

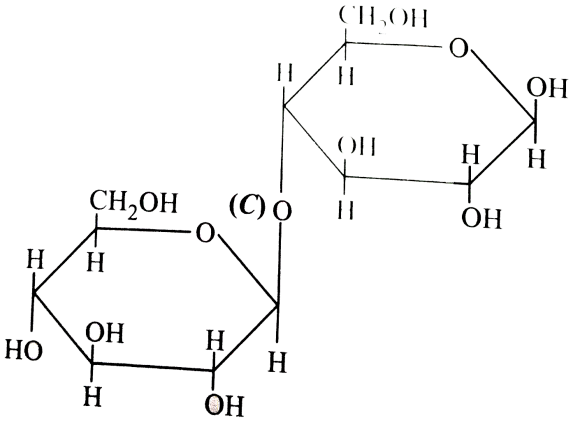
1 and C-4 and which linkages are between C-1 and C-6 ?


CH2OH
O
H
H
HO
OH
H
H
H
OH
(A)
O
CH2OH
O
H
H
OH
OH
H
H
H
OH

(I)


CH2OH
O
H
H
H
OH
OH
H
H
OH
O (B)
CH2
O
H
H
H
OH
OH
H
OH
H
OH

(II)


CH2OH
(C) O
O
H
H
HO
OH
H
H
H
OH
CH2OH
O
H
H
OH
H
H
OH

(III)

A. (A) is between C_1 and C_4 (B) and (C) are between C_1 and C_6

B. (A) and (B) are between C_1 and C_4 ,(C) is between C_1 and C_6

C. (A) and (C) are between C_1 and C_4 ,(B) is between C_1 and C_6

D. (A) and (C) are between C_1 and C_6, (B) is between C_1 and C_4

Answer: C

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47. Sucrose is a

A. monosaccharide

B. Disaccharide

C. polysaccharide

D. mixture of glucose and fructose

Answer: B

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48. The pair of sugars which give the same product with excess phenylhydrazine are:

A. starch and cellulose

B. cellulose and sucrose

C. sucrose and glucose

D. glucose and fructose

Answer: D

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49. Glucose on treatment with NH_2OH undergoes

A. condensation

B. reduction

C. hydrolysis

D. oxidation

Answer: A

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Exercise Part I Objective Questions

1. The deficiency of vitamin D causes :

A. Rickets

B. Gout

C. Scurvey

D. Night blindness

Answer: A

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Exercise Part I Correct The Following Statements By Changing The Underline Part Of The Sentence Do Not Change The Whole Sentence

1. Correct the following statements by changing the underlined part of the sentence (Do not change the whole sentence).

Fructose is <u>an aldose</u>.

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2. Correct the following statements by changing the underlined part of the sentence (Do not change the whole sentence).

α- D - glucose and β - D - glucose which differ in the orientation of hydroxyl groups C-1 are called $\underline{\text{epimers}}$,

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3. Correct the following statements by changing the underlined part of the sentence

(Do not change the whole sentence).

Fructose is called grape sugar and is the sweetest sugar.

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4. Correct the following statements by changing the underlined part of the sentence (Do not change the whole sentence).

The phenomenon of change in rotation of plane polarized light by an optically active

compound with time to an equilibrium value is called specific rotation.

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5. Correct the following statements by changing the underlined part of the sentence (Do not change the whole sentence).

Isoelectric point of glycine is 7

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6. Correct the following statements by changing the underlined part of the sentence (Do not change the whole sentence).

Sugar present in RNA is $\underline{\text{2-droxyribose}}$

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7. Correct the following statements by changing the underlined part of the sentence (Do not change the whole sentence).

Deficiency of enzyme tyrosinase causes the disease phenylketone urea.

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8. Correct the following statements by changing the underlined part of the sentence (Do not change the whole sentence).

Deficiency of vitamin A causes scurvey.

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9. Correct the following statements by changing the underlined part of the sentence (Do not change the whole sentence).

Hydrolysis of sugar is called saponification.

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10. Correct the following statements by changing the underlined part of the sentence (Do not change the whole sentence).

Disaccharide present in milk is maltose

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Exercise Part I Match Of The Following

1. Match the following

(*i*) Sucrose	(*a*) DNA
(*ii*) Protein	(*b*) Purine base
(*iii*) Adenine	(*c*) Pyrimidine base
(*iv*) Thymine	(*d*) Amide linkage
(*v*) Ribose	(*e*) Glycoside linkage
(*vi*) Purine	(*f*) RNA
(*vii*) Disaccharide	(*g*) Tollens' reagent
(*viii*) Ammonical silver nitrate	(*f*) Sucrose

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Exercise Part Ii Descriptive Questions Very Short Answer Questions

1. Classify the following into monosaccharides and disaccharides :

(i) Ribose

(ii) 2-deoxyribose

(iii) maltose

(iv) galactose

(v) fructose

(vi) lactose.

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2. What do you mean by a disaccharide?

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3. Give two examples of polysaccharides.

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4. What are the monomer units of starch and cellulose.

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5. Name the monosaccharide units present in sucrose and lactose.

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6. Name the polysaccharide which represents the polymeric structure of β-D glucose units.

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7. What is a glycoside linkage ?

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8. Write the name of a reagent that can be used to differentiate between glucose and fructose.

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9. Write the name of two compounds which are not carbohydrates but have the formula

$C_x(H_2O)$

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10. Write the name of two compounds which are carbohydrates but have the formula $C_x(H_2O)_y$.

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11. Which of the following cannot be hydrolysed further: glucose, fructose, sucrose,

ribose ?

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12. What is the basic difference between starch and cellulose?

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13. How many atoms constitute the pyranose ring of glucose?

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14. All monosaccharides exhibit optical activity. Explain.

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15. What are the products of the fermentation of glucose ?

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16. What is the action of bromine water on (i) glucose (ii) fructose?


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17. Why is glucose given to athletes under exhaustion ?


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18. What are the functional groups that can be present in monosaccharides?

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19. What happens when sucrose is boiled with dil. HCI.

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20. Why do monosaccharides form cyclic structures?

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21. Name a carbohydrate which on hydrolysis gives glucose and fructose.

Watch Video Solution

22. What are reducing and non-reducing sugars ?

Watch Video Solution

23. In what form and in which part is excess glucose stored?

Watch Video Solution

24. What are anomers ?

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25. Name two carbohydrates which act as biofuels.

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26. What are the constituents of starch?

Watch Video Solution

27. Why are carbohydrates generally optically active?

Watch Video Solution

28. Mention two main functions of carbohydrates in plants.

Watch Video Solution

29. What is the main structural feature characterising reducing sugars?

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30. What is meant by oligosaccharides and polysaccharides?

Watch Video Solution

31. What are the differences between homopolysaccharides and heteropolysaccharides? Give one example of each.

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32. Name the molecule which provides energy for all the activities in a cell.

Watch Video Solution

33. Write down the structure of sugar present in DNA.

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34. What is mutarotation ?

Watch Video Solution

35. What are zwitterions ?

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36. Sketch the zwitterion form of glycine (aminoacetic acid).

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37. What is a peptide bond?

Watch Video Solution

38. What is the importance of amino acids to us?

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39. Differentiate between fibrous proteins and globular proteins. What is meant by the denaturation of a protein ?

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40. Give one example of a denaured protein.

Watch Video Solution

41. What is a prosthetic group ?

Watch Video Solution

42. What is an amino acid ? What does it form on polymerization?

Watch Video Solution

43. What are essential amino acids ? Name any one of them? What happens when amino acid is polymerized?

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44. Glycine exists as $H_3N^+CH_2COO^-$ while anthra-nilic acid, $p-NH_2-C_6H_4COOH$ does not exist as dipolar ion.

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45. What is a polypeptide? Give one example.

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46. Name the linkage formed whenc-amino acids join to form a protein.

Watch Video Solution

47. Name the bonding inc-helix structure of protein.

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48. How many naturally occuring amino acids are found in proteins? What do you mean by essential and non-essential amino acids?

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49. What is the difference between calcination and roasting?

Watch Video Solution

50. Differentiate between simple protiens and conjugated protiens.

Watch Video Solution

51. What is denatured protein ?

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52. Define coenzymes? Give one example.

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53. What is hypervitaminoses and avitaminoses?

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54. Name the purines present in DNA.

Watch Video Solution

55. How is oxygen replenshed in our atmosphere?

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56. B-complex is an often prescribed vitamin. What is complex about it and what is its

usefulness?

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57. What type of linkage holds together the monomers of D.N.A.?

Watch Video Solution

58. Except for vitamin B_{12}, all other vitamins of group B_{12} should be supplied regularly in diet. Why?

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59. What D.N.A.or R.N.A. stand for?

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60. Give the structural formula of a nucleotide.

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61. List some important applications of enzymes.

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62. What is the difference between ribose and deoxyribose.

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63. Name the four bases present in RNA molecule.

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64. Name a carbohydrate which does not correspond to general formula $\left(C_x(H_2O)_y\right.$.

Watch Video Solution

65. What is meant by primary and secondary structure of proteins.

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66. Give reasons for the following:

(i) Proteins such as insulin used as drugs cannot be taken by mouth but must be injected.

(ii) Fresh tomatoes are a better source of vitamin C than those stored for some time.

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67. Name the vitamin which is vital for the clotting of blood?

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68. Name two facts in support of zwitterion structure ofa-amino acids.

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69. Name the vitamins whose deficiency causes (i) Night blindness (ii) Poor coagulation of blood (ii) Rickets (iv) Skin diseases.

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70. What do the following abbreviations stand for :

(i) AMP (ii) ADP (iii) ATP

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71. How many molecules of ATP are produced per molecule of glucose in glycolysis ?

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72. Name thea-amino acid which is optically inactive.

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73. What are the functions of nucleic acids ? What are the structures of sugar molecules present in DNA and RNA.

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74. What is the nature of forces holding two long DNA molecules - together?

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

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76. Is a diet consisting mainly of rice an adequate diet? Why or why not.

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77. Differentiate between anomers and epimers.

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78. Deficiency of which vitamin causes the disease pernicious anaemia ?

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79. Of the two bases named below, which one is present in RNA and which one is present in DNA ? (i) Thymine (ii) Uracil

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80. Give an example of a disaccharide that contains fructose unit in the furanose form.

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81. What type of bonding helps in stabilising the a-helix structure of proteins?

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82. What are the products of hydrolysis of sucrose ?

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83. What are the products of hydrolysis of lactose ?

Watch Video Solution

84. Write the name of the linkage joinining two amino acids.

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85. Which of the components of starch is water soluble ?

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Exercise Part Ii Descriptive Questions Short Answer Questions

1. What are carbohydrates ? Give their two functions.

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2. What is cellulose ? Give one difference between amylopectin and amylose.

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3. Draw the structures of α-D-glucose and β-D-glucose

Watch Video Solution

4. What is glucosidic linkage ? Draw the structure of maltose showing glucosidic linkage.

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5. Write four main products obtained from cellulose.

Watch Video Solution

6. What is mutarotation ?

Watch Video Solution

7. What are fibrous proteins? Explain the various steps involved in the synthesis of proteins.

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8. What is peptide linkage ? Explain the secondary structure of proteins.

Watch Video Solution

9. In its ring structure, D-glucose has no aldehyde group, it still gives an aldehyde test with Fehling solution ? Explain.

Watch Video Solution

10. What are globular proteins? Give their functions.

Watch Video Solution

11. Classify the following proteins into fibrous and globular proteins. insulin, fibroin, myosin, collagen

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12. What is the difference between starch and glycogen ?

Watch Video Solution

13. Give one difference between starch and gum

Watch Video Solution

14. What type of bonding is involved in the a-helix of proteins?

Watch Video Solution

15. Differentiate between globular and fibrous proteins.

Watch Video Solution

16. What type of bonding occurs in (a) α-helix configuration (b) proteins and (c) β-sheet ?

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17. Describe the three forces that stabilize protein structure.

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18. Draw open chain structure of aldopentose and aldohexose. How many asymmetric carbons are present in each ?

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19. Explain mutarotation. Give its mechanism in case of D-glucose.

Watch Video Solution

20. Define and classify vitamins. Give at least two examples of each type.

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21. Enumerate the structural differences between DNA and RNA. Write down the structure of a nucleoside, which is present only in RNA.

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22. What are complementary bases ? Draw structure to show hydrogen bonding between adenine and thymine and between guanine and cytosine.

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23. What is the melting temperature (T_m) of DNA ? A DNA molecule with more number of GC base pairs than AT base pairs, has higher T_m than the one with lesser number of GC base pairs than AT base pairs. Explain why?

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24. When RNA is hydrolysed there is no relationship among the quantities of four bases obtained unlike DNA. What does this fact indicate about the structure of RNA?

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25. Explain the process of DNA replication.

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26. [A]: The genetic code is degenerate.

[R]: Because the most amino acids have more than one codon.

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27. What are polysaccharides ? Name two such substances of immense use to us and state their usefulness.

Watch Video Solution

28. What are enzymes ? In what respects do they differ from conventional catalysts ?

Watch Video Solution

29. What are carbohydrates ? How do they act as a source of energy?

Watch Video Solution

30. What are proteins ? Write their two uses.

Watch Video Solution

31. What are essential amino acids ? Name two essential amino acids

Watch Video Solution

32. The two main differences between RNA and DNA are

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33. Name the anomers of glucose. How do they differ and what is the chief consequence of this difference ?

Watch Video Solution

34. How are proteins related to amino acids ? Mention a difference between a fibrous and a globular protein.

Watch Video Solution

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

Watch Video Solution

36. What role do enzymes have in the functioning of our bodies?

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37. What do you mean by a nucleotide ? Write two functions of DNA.

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38. Name the chemical components which constitute nucleotides. Write any two functions of nucleotides in a cell.

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39. Name the diseases caused due to the deficiency of vitamins A, E, B_{12} and H.

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40. Denaturation and renaturation of proteins

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41. What changes occur in the nature of egg proteins on boiling?

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42. State two main differences between globular and fibrous proteins.

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43. Answer the following queries about proteins :

(i) How are proteins related to amino acids ?

(ii) How are oligopeptides different from

polypeptides?

(iii) When is a protein said to be denatured ?

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

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45. Name two fat soluble vitamins, their sources and the diseases caused due to their deficiency.

Watch Video Solution

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

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47. Name the two components of starch. How do they differ from each other structurally ?

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48. Define the following terms:

(i) Coenzymes

(ii) Nucleotides

(iii) List four main functions of carbohydrates in organisms.

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49. Write the chemical equations for the reactions of glucose with

(i) acetic anhydride

(ii) NH_2OH. Also draw Fischer projections of a D-glucose and L-glucose.

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50. Give the plausible explanation for the following:

(i) Glucose doesn't give 2,4-DNP test.

(ii) The two strands in DNA are not identical but are complementary

(iii) Starch and cellulose both contain glucose unit as monomer. yet they are structurally different.

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51. Despite having an aldehydic group

Draw the Haworth structure of a-D-(+) gluco-pyranose

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52. Despite having an aldehydic group

What is the significance of D and (+) here?

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53. What are the three main classes of organic compounds that account for the molecular complexity of cells.

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

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55. The tertiary structure of many proteins dissolved in water is disrupted by heating above $80^{\circ}C$ but primary structure is unaffected. Explain.

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56. In human system, starch acts as a nutrient but cellulose does not. Explain. Why?

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57. Discuss 'Enzymes lower the activation energy'.

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58. Amylose and cellulose are both straight chain polysaccharides containing only D-glucose units. What is the structural difference between the two?

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59. What is the role of vitamin C in our daily life?

Watch Video Solution

60. What are the constituents of starch?

Watch Video Solution

61. Write two differences between polypeptides and proteins.

Watch Video Solution

62. State two important differences between catalysts and enzymes.

Watch Video Solution

63. Write two differences between essential and non-essential amino acids.

Watch Video Solution

64. What are vitamins ? Which vitamin deficiency causes night blindness and scurvy?

Watch Video Solution

65. Describe what you understand by primary structure and secondary structure of proteins.

Watch Video Solution

66. How will you distinguish between urea and glycine ?

Watch Video Solution

67. How will you distinguish between acetamide and glycine?

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Exercise Part Ii Descriptive Questions Long Answer Questions

1. What are carbohydrates ? How do monosaccharides, disaccharides and polysaccharides differ from each other? Also write two functions of carbohydrates.

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2. Give the chemistry of sliver mirror test and Fehling solution test for glucose.

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3. Write down the structures and names of the products obtained when D-glucose is treated with

(i) acetic anhydride

(ii) hydrocyanic acid

(iii) bromine

(iv) conc. HNO_3 and

(v) HI.

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4. The melting points of amino acids are higher than the corresponding halo-acids because

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5. Give reasons for the following

Amino acids are amphoteric in behaviour.

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6. Give reasons for the following

On electrolysis in acidic solution, amino acids migrate towards cathode while in alkaline solution these migrate towards anode.

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7. Give reasons for the following

The mono-amino carboxylic acids have two pK_a values.

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8. If three amino acids viz., glycine, alanine and phenylalanine react together, how many possible tripeptides can be formed? Write down the structures and names of each one. Also write their names using three and one letter abbreviations for each amino acid.

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9. What type of linkage are responsible for the formation of:

(i) Primary structure of proteins

(ii) Cross-linking of polypeptide chains

(iii) a-helix formation

(iv) β-sheet structure ?

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10. What type of forces stabilize a protein structure ?

Watch Video Solution

11. Discuss 'Enzymes lower the activation energy'.

Watch Video Solution

12. Name two facts in support of zwitterion structure ofa-amino acids.

Watch Video Solution

13. What is the basic difference between starch and cellulose?

Watch Video Solution

14. What are proteins? Name the products obtained during their hydrolysis. What is the effect of heat on these ? Give their importance.

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15. Write the repeating unit in polypeptides. Write the structure of glycylglycine and mark the peptide linkage in it.

Watch Video Solution

16. What are enzymes ?

Watch Video Solution

17. Write the names of enzymes whose deficiency causes albinism and phenyl- ketone urea.

Watch Video Solution

18. Differentiate between :

(a) DNA and RNA

(b) Ribose and deoxyribose

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19. What are vitamins ? List at least four vitamins. Describe their function and their affects because of their deficiency in the body.

Watch Video Solution

20. Which forces are responsible for the stability of α -helix ? Why is it named as 3.6_{13} helix ?

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21. What are the products obtained on complete hydrolysis of DNA ? Write down the structure of pyrimidine and purine bases present in DNA.

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22. Alkaline $KMnO_4$ oxidises lactic acid to give:

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23. Draw the furanose ring structure of α -D-fructose

Watch Video Solution

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

Watch Video Solution

25. Differentiate between reducing and non-reducing sugars.

Watch Video Solution

26. Write the chemical reactions of glucose with

(i) NH_2OH (ii) $(CH_3CO)_2O$. Also draw Fischer projections of D-glucose and L-glucose.

Watch Video Solution

27. Name the food sources and the deficiency diseases caused due to lack of any two of vitamins A, C, E and K.

Watch Video Solution

28. State the composition and functional diffrences between DNA and RNA. Describe the mechanism of replication of DNA.

Watch Video Solution

29. Mention two differences between amylopectin and cellulose.

Watch Video Solution

30. Define the following terms:

(i) Coenzymes

(ii) Nucleotides

(iii) List four main functions of carbohydrates in organisms.

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31. Name different types of RNA found in the cell. State one function of each.

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Isc Examination Qustions Part I Descriptive Questions

1. An example of fibrous protein is :

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2. What class of compounds are got by the complete hydrolysis of simple proteins?

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3. How will you convert glucose to gluconic acid ? Write the relevant equation.

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4. What are peptides?

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5. How will you convert glucose to osazone?

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6. Compare the components that constitute DNA and RNA.

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7. Give one test to distinguish glucose and fructose.

Watch Video Solution

8. How will you show the amphoteric nature of glycine? Mention the pH value for its isoelectric point.

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9. Write the relavent equations to convert fructose to osazone.

Watch Video Solution

10. Give one test to distinguish between starch and cellulose

Watch Video Solution

11. How will you convert chloroacetic acid to glycine?

Watch Video Solution

12. How will you distinguish between glucose and sucrose ? Give one good chemical test.

Watch Video Solution

13. How will you convert glucose to saccharic acid ?

Watch Video Solution

14. Give one example of a fibrous protein.

Watch Video Solution

15. Deficiency of what vitamins will cause the following diseases:

(i) Night blindness

(ii) Scurvy?

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16. (i) What type of isomers are glucose and fructose ?

(ii) Name the functional group common to both glucose and fructose.

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17. The deficiency of which vitamin will cause the following diseases:

(i) Scurvy

(ii) haemorages.

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18. (i) What do you observe when glucose is treated with bromine water?

(ii) What is isoelectric point ?

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

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20. Name the nitrogen base residues present in DNA ?

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21. What do you observe when glucose solution is heated with Tollens' reagent?

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