CHEMISTRY

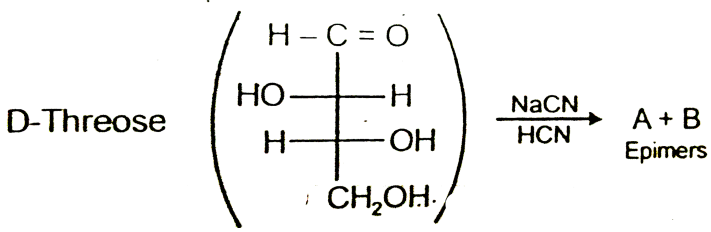
JEE MAIN AND ADVANCED

BIOMOLECULES

Illustration

1. (1) What product would be formed when D-Glucose is treated with HIO_4 ?

(2) D-Threose



Why epimers formed are in unequal amounts?

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Example

1. Which of the following disaccharide is not a reducing sugar?

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2. Which amino acid is optically inactive?

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3. Compounds of biological systems which actuate chemical reactions are

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4. Beri-beri is caused due to :

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5. DNA has deoxyribose, a base and the third component is

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6. Which is not a reducing sugar?

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7. Which amino acid is optically inactive?

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8. Name the molecules which catalyses, biological reactions.

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9. Beri-beri is caused due to :

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10. The third component present along with deoxyribose and a base in DNA is _____.

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Try Yourself

1. What is maximum number of monosaccharide unit present in oligosaccharides?

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2. Glucose exists in how many forms in equilibrium?

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3. Reducing sugar is

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4. Which is the most stable anomer of glucose?

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5. Give the name of two conjugated protiens.

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

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7. Give the name of two acidic amino acids.

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8. The enzyme present in saliva is

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9. The disease albinism is caused by the deficiency of

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10. Which enzyme converts urea into CO_2 and NH_3?

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11. Name the enzyme that catalyses maltose into glucose.

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12. Vitamin containing cobalt is

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13. The vitamins which is neither soluble in water nor in fat is

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14. Which one is water soluble vitamin ?

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15. What is obtained by hydrolysis of nucleic acid?

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16. The sugar present in DNA is :

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17. Who gave the double strand helix structure of DNA?

A. Watson and Crick

B. Robert Hooke

C. J.J. Thomson

D. Rutherford

Answer: A

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Competition Level Section A

1. Which of the following is a reducing sugar?

A. Glycogen

B. Maltose

C. Sucrose

D. Starch

Answer: B

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2. Glucose reacts with HNO_3 to form

A. Gluconic

B. Saccharic

C. Sulphuric

D. Glyconic

Answer: B

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3. Carbohydrate is a condensation polymer of

A. Amino acid

B. Nucleotides

C. Styrene

D. Simple sugars

Answer: D

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4. Glucose when reduced with HI and red phosphorus gives

A. n-pentane

B. n-butane

C. n-hexane

D. n-heptane

Answer: C

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5. Which of the following carbohydrates cannot be directly utilised by the human body as a source of energy?

A. Starch

B. Cellulose

C. Glycogen

D. All of these

Answer: B

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6. Which of the following is an essential amino acid?

A. Asparagine

B. Glutamine

C. Histidine

D. Alanine

Answer: C

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7. Which of the following amino acid is optically inactive?

A. Lysine

B. Glutamine

C. Serine

D. Glycine

Answer: D

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8. Rice is deficient in which of following essential amino acids?

A. Lysine

B. Leucine

C. Glycine

D. Alanine

Answer: A

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9. Deficiency of which of the vitamin in causes rickets?

A. Vitamin-D

B. Vitamin-C

C. Vitamin-B_{12}

D. Vitamin-E

Answer: A

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10. The vitamin which is water soluble ?

A. Vitamin-C

B. Vitamin-D

C. Vitamin-A

D. Vitamin-K

Answer: A

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11. Glycosidic linkage is present in

A. Proteins

B. Lipids

C. Carbohydrates

D. Nucleic acids

Answer: C

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

A. Cellulose

B. Sucrose

C. Maltose

D. Glycogen

Answer: D

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

A. Anomers

B. Epimers

C. Enantiomers

D. All of these

Answer: A

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14. Which of the following is basic amino acid?

A. Lysine

B. Valine

C. Aspartic acid

D. Glycine

Answer: A

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15. Which of the following disaccharide consists only of glucose unit?

A. Sucrose

B. Maltose

C. Lactose

D. All of these

Answer: B

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16. Which one of the following is invert sugar ?

A. Lactose

B. Maltose

C. Sucrose

D. All of these

Answer: C

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17. Which of the following component in starch is water insoluble?

A. Amylose

B. Glycogen

C. Amylopectin

D. Cellulose

Answer: C

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18. Which of the following can be called 'animal starch'

A. Cellulose

B. Amylose

C. Glycogen

D. Maltose

Answer: C

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19. Antibodies are:

A. Carbohydrates

B. Proteins

C. Lipids

D. Enzymes

Answer: B

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20. Teritiary structures of proteins is given by

A. α-helix

B. Folding of secondary structure

C. β-pleated sheets

D. All of these

Answer: B

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21. The helical structure of protein is stabilised by:

A. Peptide bonds

B. Hydrogen bonds

C. Dipeptide bonds

D. van der Waals' forces

Answer: B

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22. Albumin is a type of

A. Fibrous protein

B. Globular protein

C. Lipid

D. Carbohydrate

Answer: B

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23. On acetylation with acetic anhydride, glucose gives

A. Diacetate

B. Hexa-acetate

C. Pentacetate

D. Tetra-acetate

Answer: C

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24. Co is present in which of the following vilamin?

A. Vitamin-A

B. Vitamin-C

C. Vitamin-B_{12}

D. Vitamin-D

Answer: C

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25. In DNA, the complementary bases are:

A. Uracil & Adenine : Cytosine & Guanine

B. Thymine & Adenine : Guanine & Cytosine

C. Adenine & Thymine : Guanine & Uracil

D. Adenine & Guanine : Thymine & Cytosine

Answer: B

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26. Choose the correct statement about isoelectric point

A. If pH $>$ isoelectric point amino acid will move towards cathode

B. At this point amino acid is present in the form of Zwitter ion

C. If pH $<$ isoelectric point, amino acid will move towards anode

D. Al this point amino acids are basic in nature

Answer: B

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27. Amino acids are known to be bullding blocks of

A. Proteins

B. Nucleic acids

C. Carbohydrates

D. Vitamins

Answer: A

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28. Nucleotides are formed of

A. A phosphoric acid group

B. A nitrogenous base

C. A pentose sugar

D. All of these

Answer: D

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29. DNA-directed synthesis of proteins occurs through

A. Transcription

B. Translation

C. Transformation

D. Both (1) & (2)

Answer: D

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30. The relationship between the nucleotide triplets and the amino acid is called.

A. Gene

B. Nucleoside

C. Genetic code

D. Gene pool

Answer: C

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31. Correct order of calorific value is

A. Carbohydrates $>$ Fats $>$ Proteins

B. Fats $>$ Carbohydrates $>$ Proteins

C. Proteins $>$ Carbohydrates $>$ Fats

D. Fats $>$ Proteins $>$ Carbohydrates

Answer: B

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32. The best solvent to remove butter stain from cloth is :

A. $CHCl_3$

B. C_2H_5OH

C. $C_2H_5OC_2H_5$

D. H_2O

Answer: C

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33. The commonest disaccharide has the molecular formula?

A. $C_{12}H_{22}O_{11}$

B. $C_{10}H_{20}O_{10}$

C. $C_{10}H_{18}O_9$

D. $C_{10}H_{32}O_{11}$

Answer: A

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34. Mutarotation is not seen in

A. Sucrose

B. D-Glucose

C. L-Glucose

D. Fructose

Answer: A

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35. Mutarotation in aqueous solution is shown by

A. Glycogen

B. Sucrose

C. Cellulose

D. Maltose

Answer: D

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

A. Acetic acid

B. α-aminoethanoic acid

C. Benzoic acid

D. Formic acid

Answer: B

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37. Branched chain structure is shown by

A. Amylopectin

B. Cellulose

C. Amylose

D. Nylon

Answer: A

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38. The number of amino acids required to form a tripeptide bond are

A. Seven

B. Two

C. Six

D. Four

Answer: D

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39. Glucose does not give

A. Schiff's test

B. Hydrogensulphite addition product with $NaHSO_3$

C. 2,4 DNP test

D. All of these

Answer: D

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

A. Anomers

B. Enantiomers

C. Epimers

D. Metamers

Answer: A

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41. Glucose reacts with HCN to give

A. Saccharic acid

B. Cyanohydrin

C. n-hexane

D. Gluconic

Answer: B

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42. Cellulose is soluble in

A. Water

B. Organic solvents

C. Ammonical cupric hydroxide solution

D. All of these

Answer: C

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43. Glucose does not react with

A. NH_2OH

B. $C_6H_5NHNH_2$

C. $NaHSO_3$

D. HCN

Answer: C

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44. Keratin in skin , hair, nails and wool is a

A. Fibrous protein

B. α-helix type

C. Glubular protein

D. None of these

Answer: A

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45. Which structure of proteins involve in denaturation?

A. Primary structure

B. Secondary structure

C. Tertiary structure

D. Quaternary structure

Answer: D

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46. On hydrolysis of cane sugar, we can obtain

A. Fructose + Glucose

B. Fructose + Fructose

C. Glucose + Glucose

D. Glucose + Lactose

Answer: A

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47. Which is correct statement?

A. Starch is a polymer of α-glucose

B. Amylose is a component of cellulose

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

D. In cyclic structure of pyranose, there are five carbons and one oxygen atom

Answer: A

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48. Enzymes in the living systems

A. Provide energy

B. Provide immunity

C. Transport oxygen

D. Catalyze biological reactions

Answer: D

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49. In the double helix structure of DNA, the base pairs are

A. part of the backbone structure

B. inside the helix

C. outside the helix

D. Bonded with covalent bond

Answer: B

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50. Which of the following is not an α-amino acid?

A. Glycina

B. Alanine

C. Histidine

D. Benzidine

Answer: D

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Objective Type Question Objective Type Questions One Option Is Correct

1. $X + NH_3 \xrightarrow{50^\circ C} Y \xrightarrow{H^+ / H_2O} H_2N - CH_2COOH$

Compound X is

A. Chloroacetic acid

B. Bromoacetic acid

C. outside the helix

D. Acetic acid

Answer: C

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2. The helical structure of protein is stabilised by:

A. Peptide bond

B. Dipeptide bond

C. van der Waal 's forces

D. Hydrogen bond

Answer: D

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3. When protein is subjected to denaturation

A. It is hydrolysed to constituent amino acids

B. Electric field has no influence on its migration

C. Constituent amino acids are separated

D. It uncoils from an ordered and specific conformation into a more random conformation and precipitates from solution

Answer: D

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4. Fructose reduces Tollens reagent due to

A. Presence of ketonic group

B. Presence of NH_4OH is Tollen's reagent

C. Rearrangement of fructose into a -mixture of glucose, fructose and mannose

D. Both (2) & (3)

Answer: D

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5. D-glucose reacts with phenylhydrazine to make osazone. How many molecules of phenylhydrazine are used for this reaction per molecule of D-glucose?

A. One

B. two

C. three

D. four

Answer: C

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Section B Objective Type Questions One Option Is Correct

1. In alkalin solution D-glucose, D-mannose and D-fructose are in equilibrium. This reaction is known as

A. Fries rearrangement

B. Lobry de Bruyn-van Enkelstein rearrangement

C. Hofmann rearrangement

D. Kolbe's reaction

Answer: B

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2. During mutarotation of β-D-glucose in aqueous solution angle of optical rotation

A. Remains constant value of + 111°

B. remains constant value of + 19.2°

C. changes from an angle of 112° to a constant value of $+52.5^\circ$

D. changes from an angle of 19.2° to a constant value of $+52.5^{\circ}$

Answer: D

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3. Which of the folfowing is correct about cellulose?

A. It is an imporant food material

B. It has only α -glucosidic linkage between two D-glucose unit

C. It has only β-glucosidic linkage between two D-glucose unit

D. It is sweet in taste

Answer: C

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4. Which of the following is incorrect about isoelectric point of amino acid?

A. At this point amino acid is present in the form of zwitter ion

B. At this point amino acid is electrically neutral

C. If pH- $>$ isoelectric point amino acid will move toward anode

D. If pH- $>$ isoelectric point amino acid will move toward cathode

Answer: D

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5. If a native protein is subjected to physical or chemical treatment which may disrupt, its higher structure without affecting prirnary structure then this process is called

A. Inversion of protein

B. Denaturation of protein

C. Renaturation of protein

D. Fermentation

Answer: B

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6. Ring structure of glucose is due to formation of hemiacetal and ring formation between

A. C_1 and C_5

B. C_1 and C_4

C. C_1 and C_3

D. C_2 and C_4

Answer: A

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7. Acid hydrolysis of sucrose causes

A. Estrification

B. Saponifaction

C. Inversion

D. Rosenmund reduction

Answer: C

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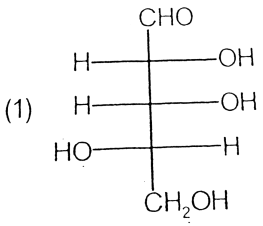
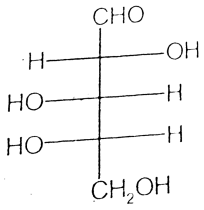
8. Which of the following gives an optically inactive aldaric acid on oxidatin with dilute nitric acid ?

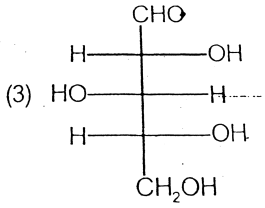


A.

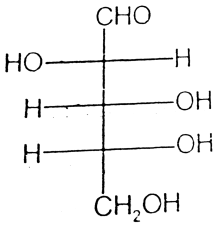
B.



C.



D.



Answer: C

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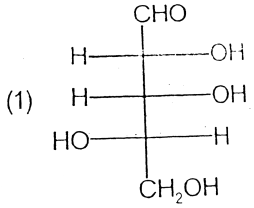
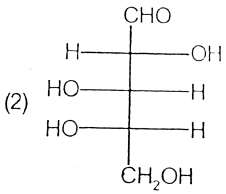
9. $(+)-$ Arabinose is $(2R, 3S, 4S)-$ aldopentose. Which of the following is $(+)$ arabinose ?

A.



B.



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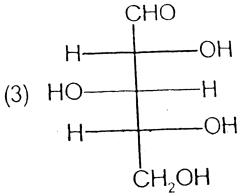
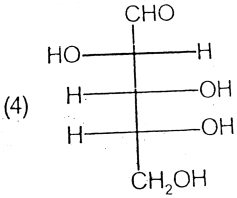


D.



Answer: B

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10. A tripeptide is composed equally of L-valine, L-tyrosine and L-alanine (one molecule of each). How many isomeric tripeptides of this kind may exist?

A. 3

B. 4

C. 6

D. 8

Answer: C

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11. Peptides are formed by the joining of amino acids through amide linkage. Which of the following statement is not true

in this respect?

A. Amide group are more resistent to hydrolysis than one similar ester groups

B. $p - \pi$ resonance stabilizes the amides bond

C. Stable conformation of peptides are restricted to those having planer amide groups

D. Amide groups do not participate in hydrogen bonding interaction

Answer: D

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Section C Objective Type Questions More Than One Option Is Correct

1. Which of the following compounds contain amide linkage?

A. Nylon-6

B. Acetamide

C. Proteins

D. Cellulose

Answer: A::B::C

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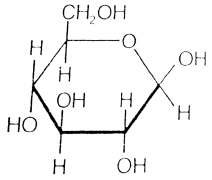
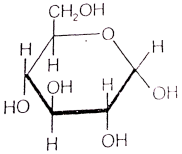
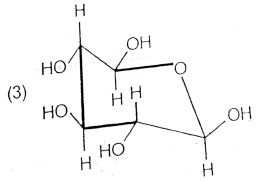
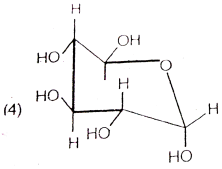
2. What would be the correct structure of $\beta - D -$ Glucose?

A. (1) 

B. (2) 

C. (3) 

D. (4) 

Answer: A::C

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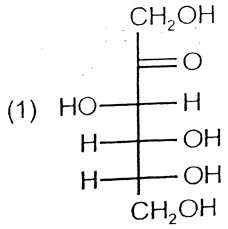
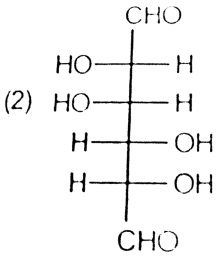
3. When D-Glucose reacts with three moles of phenylhydrazine it forms glucosazone. Which of the

following carbohydrates will give some osazone as that of D-Glucose?

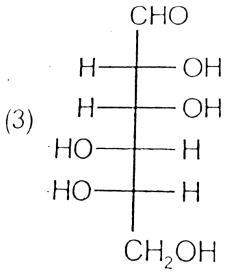
A.



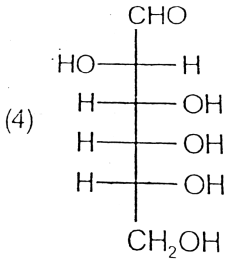
B.



C.



D.



Answer: A::B

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4. On hydrolysis which of the following carbohydrates give only glucose?

A. Lactose

B. Cellobiose

C. Maltose

D. Sucrose

Answer: B::C

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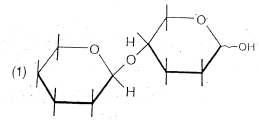
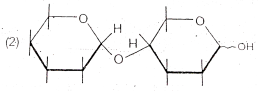
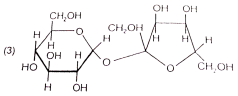
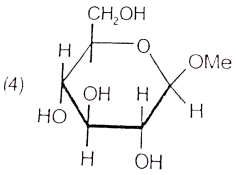
5. Which of the following sugars will form osazones?

A. 

B. 

C. 

D. 

Answer: A::B

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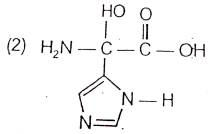
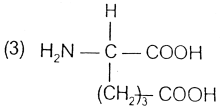
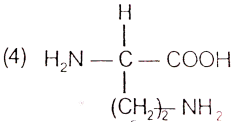
6. Which of the following amino acids will have +2 net charge at pH = 1?

A. $H_2N - \underset{\underset{H}{|}}{\overset{\overset{CH_3}{|}}{C}} - \overset{\overset{O}{||}}{C} - OH$

B. 

C. 

D. 

Answer: B::D

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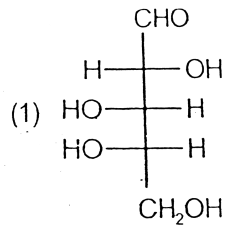
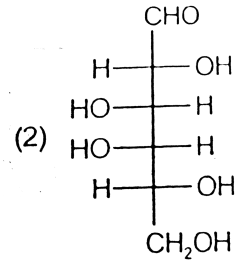
7. Which of the following aldoses will give achiral product with $NaBH_4$?

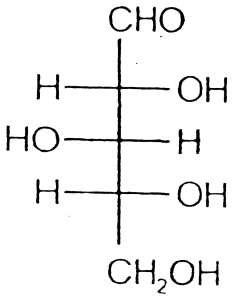
A.



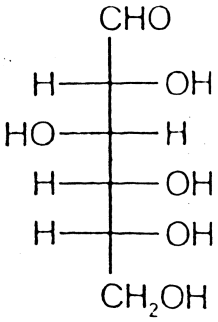
B.



C.



D.



Answer: B::C

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8. Denaturation of protein can be brought about by

A. Changing concentration

B. Changing pH

C. Changing Temperature

D. Changing amino acid sequence

Answer: B::C

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9. Choose Correct statements about proteins

A. Primary structure of proteins refer to amino acid sequence

B. Interaction between three polypeptide chains give rise to tertiary structure of proteins

C. Association between four polypeptide chains give quaternary structure of proteins

D. Folding of polypeptide chain due to interaction between carbonyl group and $-\overset{|}{N}-H$ group of peptide linkage give rise to secondry structure

Answer: A::D

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10. Which of the following is/are stabilizing interaction in protein folding?

A. Hydrogen bond formation

B. Peptide bonds

C. Disulphide bonds

D. Hydrophobic interaction

Answer: A::C::D

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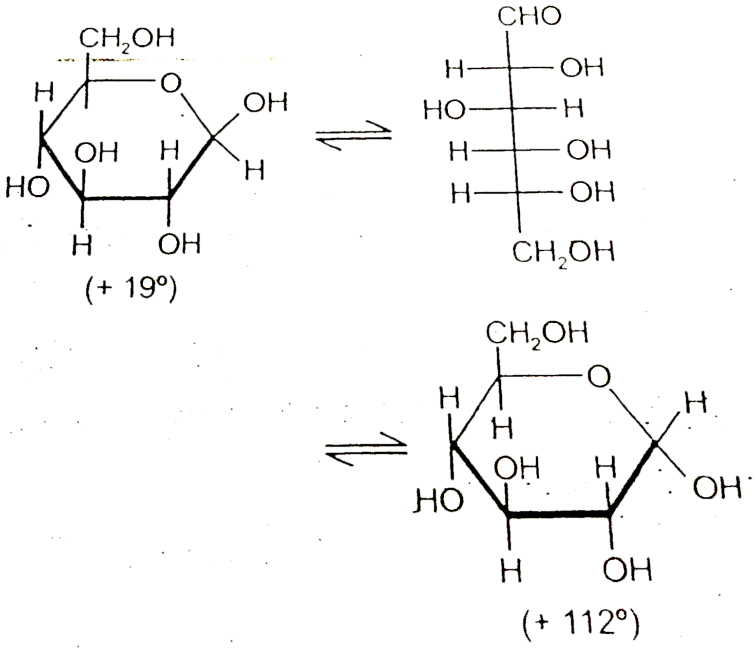
Section D Comprehension Questions

1. When either form of D-Glucose is dissolved In water, the solution gradually changes its optical rotation and finally attains a constant optical rotation of $+52^{\circ}$.



Which form of D-Glucose is more stable?

A. αD-Glucose

B. βD-Glucose

C. Open chain

D. All forms are equally stable

Answer: B

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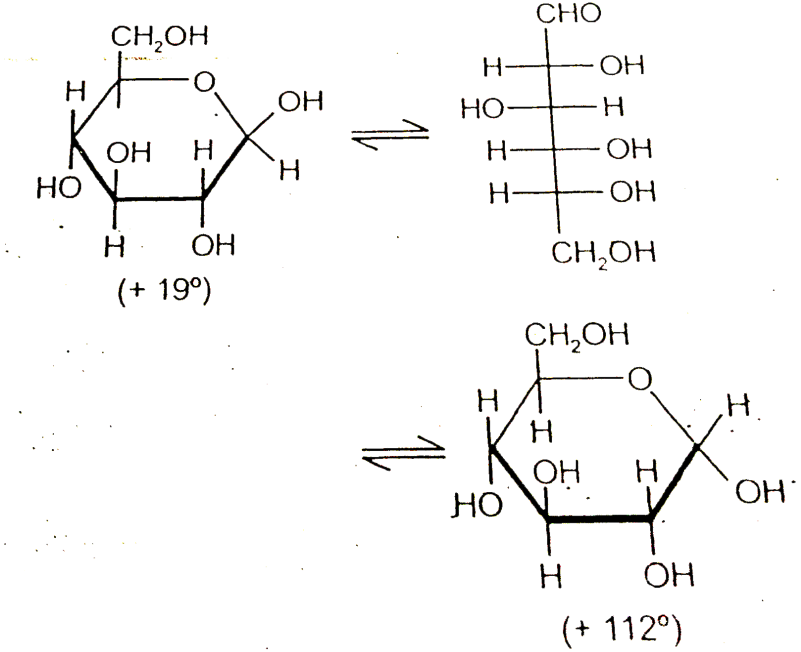
2. When either form of D-Glucose is dissolved In water, the solution gradually changes its optical rotation and finally attains a constant optical rotation of $+52^{\circ}$.



What is the percentage of open chain D-Glucose in solution?

A. 0.36

B. 0.64

C. 0.005

D. 0.333

Answer: C

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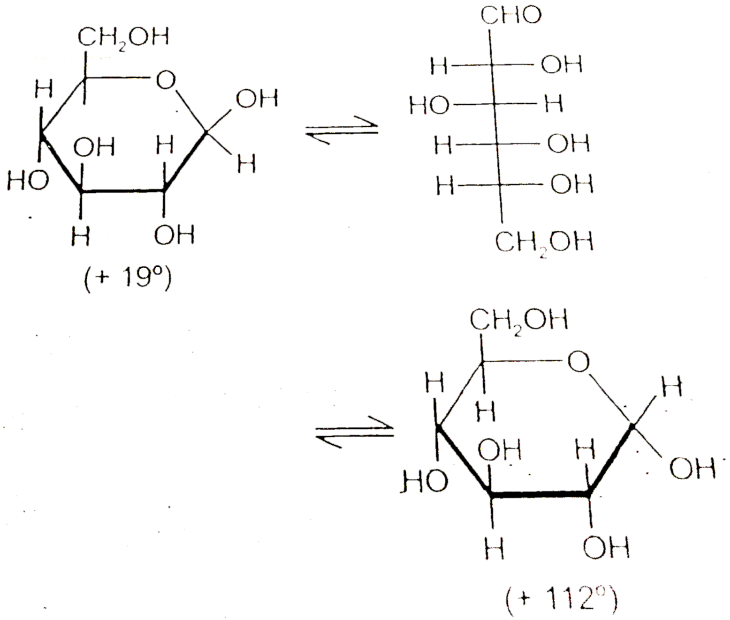
3. When either form of D-Glucose is dissolved In water, the solution gradually changes its optical rotation and finally attains a constant optical rotation of $+52^{\circ}$.



Which of the following statements, is true?

A. Because of the presence of alcoholic group in D-Glucose it exhibits mutarotation

B. Because of the presence of $>$ C = O group in Glucose it exhibits mutarotation

C. All sugars exhibit mutarotation

D. Because of free hemiacetal linkage in cyclic form, D-Glucose exhibit mutarotation

Answer: D

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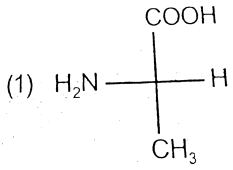
4. Carboxylic acids containing an amino group $(-NH_2)$ as a substituent are called amino acids. When this amino group substitution is at α position with respect to carboxylic group, the aminoacid is called α-amino acid. The aminoacids with two carboxylic acids are called acidic amino acids

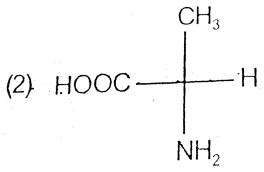
whereas aminoacids with two amino group are called basic amino acids Amino acids show amphoteric character. Ali chiral natural amino acids exist in L-form. :

Each of the following represent natural alanine (an amino acid) except

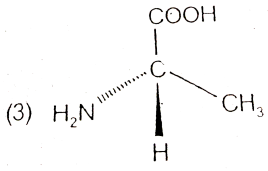
A.



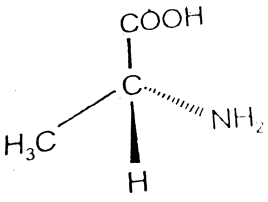
B.



C.



D.



Answer: D

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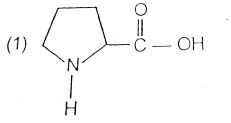
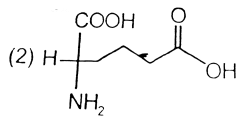
5. Carboxylic acids containing an amino group $(-NH_2)$ as a substituent are called amino acids. When this amino group substitution is at α position with respect to carboxylic group, the aminoacid is called α-amino acid. The aminoacids with two carboxylic acids are called acidic amino acids whereas aminoacids with two amino group are called basic amino acids Amino acids show amphoteric character. Ali chiral natural amino acids exist in L-form. :

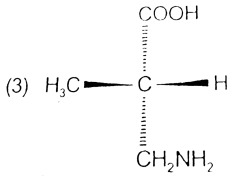
Which of the following is not an α-amino acid?

A. 

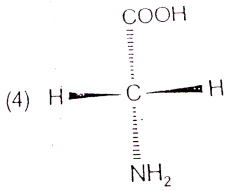
B.



C.



D.



Answer: C

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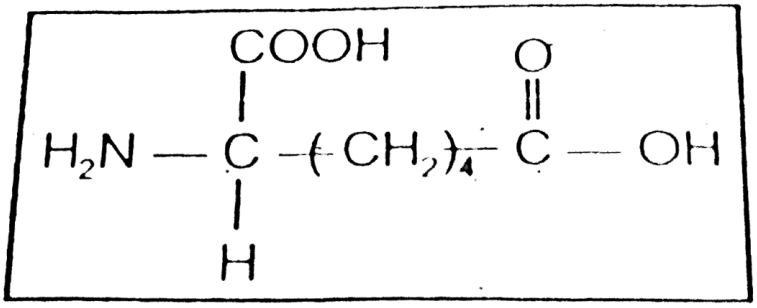
6. Carboxylic acids containing an amino group $(-NH_2)$ as a substituent are called amino acids. When this amino group substitution is at α position with respect to carboxylic group, the aminoacid is called α-amino acid. The aminoacids

with two carboxylic acids are called acidic amino acids whereas aminoacids with two amino group are called basic amino acids Amino acids show amphoteric character. Ali chiral natural amino acids exist in L-form. :

What would be the net charge on the given amino acid at pH=14?



A. $+1$

B. $+2$

C. -1

D. -2

Answer: D

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7. Aldehydes ahd ketones are converted to acetals by treatment with an alcohol and a trace of acid catalyst. These conditions also convert aldoses and ketoses to the acetals, call glycosides. In glycosides, an aglycone is the group bonded to the anomeric carbon atom.

Example : Methanol is the aglycone in a methyl glycoside.

In ethyl α-D glucopyranoside, aglycone part is

A. CH_3CH_2-

B. CH_3-

C. CH_3CH_2O-

D. CH_3OH

Answer: C

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Section E Assertion Reason Type Questions

1. STATEMENT-1 : Primary structure of proteins is determined by amino acid sequence.

and

STATEMENT-2 Intramolecular hydrogen bonding between carbonyl group and $-\overset{|}{N}-H$ group is responsible for the folding of polypeptide chain.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a corrèct explanation for Statement-1

C. Statement-1 is True, Statement-2 is False

D. Statement-1 is False, Statement-2 is True

Answer: B

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2. STATEMENT-1 : Glucose and fructose can be differentiated by Fehling's solution.

and

STATEMENT-2 Glucose is an aldose while fructose is a ketose (having keto functional group).

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-2

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a corrèct explanation for Statement-2

C. Statement-1 is True, Statement-2 is False

D. Statement-1 is False, Statement-2 is True

Answer: D

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3. STATEMENT-1: D-Glucose and D-Mannose are C-2 epimers and

STATEMENT-2 : They only have different configuration at carbon number-2.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-3

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a corrèct explanation for Statement-3

C. Statement-1 is True, Statement-2 is False

D. Statement-1 is False, Statement-2 is True

Answer: A

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4. Statement I: All enzymes are protiens but all proteins are not enzymes.

Statement II: Enzymes are biocatalysts and have stable configuration having an active site.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-4

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a corrèct explanation for Statement-4

C. Statement-1 is True, Statement-2 is False

D. Statement-1 is False, Statement-2 is True

Answer: B

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5. STATEMENT-1:Cellulose is a polymer of glucose.

and

STATEMENT-2 : Reducing sugars undergo mutarotation.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-5

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a corrèct explanation for Statement-5

C. Statement-1 is True, Statement-2 is False

D. Statement-1 is False, Statement-2 is True

Answer: B

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Section E Matrix Match Type Questions

1. Match the following

Column-I	Column-II
(A) Glucose	(p) Undergoes hydrolysis
(B) Fructose	(q) React with Fehling solution
(C) Sucrose	(r) React with Tollen's reagent
(D) Maltose	(s) Glycosidic linkage

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2. Match column-I with column-II

Column-I	Column-II
(A) Maltose	(p) Polymer of D-Glucose
(B) Cellulose	(q) Non-reducing sugar
(C) Amylose	(r) Disaccharide
(D) Invertose	(s) Reducing sugar

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3. Match the following

Column I	Column II
(A) Sucrose	(p) Diasaccharide
(B) Cellobiose	(q) Reducing sugar
(C) Maltose	(r) α-Glycosidic linkage
(D) Fructose	(s) β-Glycosidic linkage
	(t) Shows mutarotation

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4. Match column-I with column-II

Column-I	Column-II
(A) Glucose	(p) React with Tollen's reagent
(B) Fructose	(q) React with Fehling reagent
(C) Sucrose	(r) React with phenyl hydrazine to form osazone
(D) Maltose	(s) It is a disachharide
	(t) It is a furanose sugar

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5. Match column-I with column-II

Column-I (Pair of molecules)	Column-II (Characteristic)
(A) Glucose-Fructose	(p) Anomer
(B) Fructose-Mannose	(q) Diastereomer
(C) Glucose-Mannose	(r) Functional isomer
(D) α-D-Glycopyronose β-D-Glucopyronose	(s) Lobry-De-Bryun Van-Ekenstein rearrangeme
	(t) Both are reducing sugars

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6. Match column-I with column-II

Column-I	Column-II
(A) Glycine	(p) Optically inactive
(B) Alanine	(q) Optically active
(C) Lysine	(r) Bear two —COOH
(D) Glutamic acid	(s) Bear two $—NH_2$
	(t) Cationic in highly acidic medium

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Section G Integer Answer Type Questions

1. What is the total number of acidic amino acids found in human proteins?

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2. Net charge available on a basic amino acid at pH=1 would be ___ .

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3. How many different tripeptides can be obtained from alanine, glycine and phenylalanine, each tripeptide containing all the three amino acids?

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4. The number of chiral carbon in one molecule of α-D glucose is _____ .

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Section H Multiple True False Type Questions

1. STATEMENT-1 : Glycine is an achiral amino acid.

STATEMENT-2 : pH of alanine is less than 7

STATEMENT-3: Almost all proteins are polypeptides

A. TTT

B. FFF

C. TFT

D. FTF

Answer: A

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2. STATEMENT-1 : Sucrose is a reducing sugar

STATEMENT-2 : Sucrose has two glycosidic linkages.

STATEMENT-3: Sucrose shows mutarolation.

A. TTF

B. TFT

C. FTF

D. FTT

Answer: C

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3. STATEMENT-1 : α-D-glucoso shows mutarotation.

STATEMENT-2 : Sucrose on hydrolysis produces β-D-glucose.

STATEMENT-3: Mannose is an aldohexose

A. TFT

B. FTF

C. TTT

D. FFF

Answer: A

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4. STATEMENT-1: Essential amino acids are produced by body

STATEMENT-2 : Non-essential amino acids are not produced by body.

STATEMENT-3 : All carbohydrates must have chiral carbon

A. TTT

B. FFT

C. FFF

D. TTF

Answer: C

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5. STATEMENT-1: Biologically active form of protein is quaternary structure.

STATEMENT-2 : β-sheets are secondary structure of protein

STATEMENT-3 : Basic sequence of amino acids is defined by primary structure of protein.

A. TTT

B. FFF

C. FTT

D. FFT

Answer: A

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Section I Subjective Type Questions

1. Convert D-erythrose to next higher aldose.

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2. Glucose, Mannose and fructose.give identical osazones. Explain

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3. α-glucose is oxidized by HIO_4 more rapidly than its β-anomer at the 1-2 bond.

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4. How much of the α-anomer and β-anomers are present in an equilibrium mixture with a specific rotation of $+52.6^{\circ}$?

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5. Compound (A) $C_5H_{10}O_5$ give a tetra-acetate with Ac_2O and oxidation of (A) with $Br_2 - H_2O$ gives an acid, $C_5H_{10}O_6$ Reduction of (A) wilh HI and red phosphorous gives 2-methyl butane. What is the structure of (A)?

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6. Number of possible stereoisomers of glucose and fructose.

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Section J Aakash Challengers Question

1. In a paper electrophoresis amino acids and peptides can be separated by their differential migration in an electric field. To the center of a strip of paper, wet with buffer at pH=6 is applied a mixture of the following three peptides in a single small spot: Gly-Ala, Gly-Asp and Gly-Arg. A positively charged electrode (anode) is attached to the left side of the paper and a negatively charged electrode (cathode) to the rightside. A voltage is applied across the ends of the paper for a time, after which the peptides have separated into three spots. One near the location of the original spot whtch peptide is in each spot? Explain.

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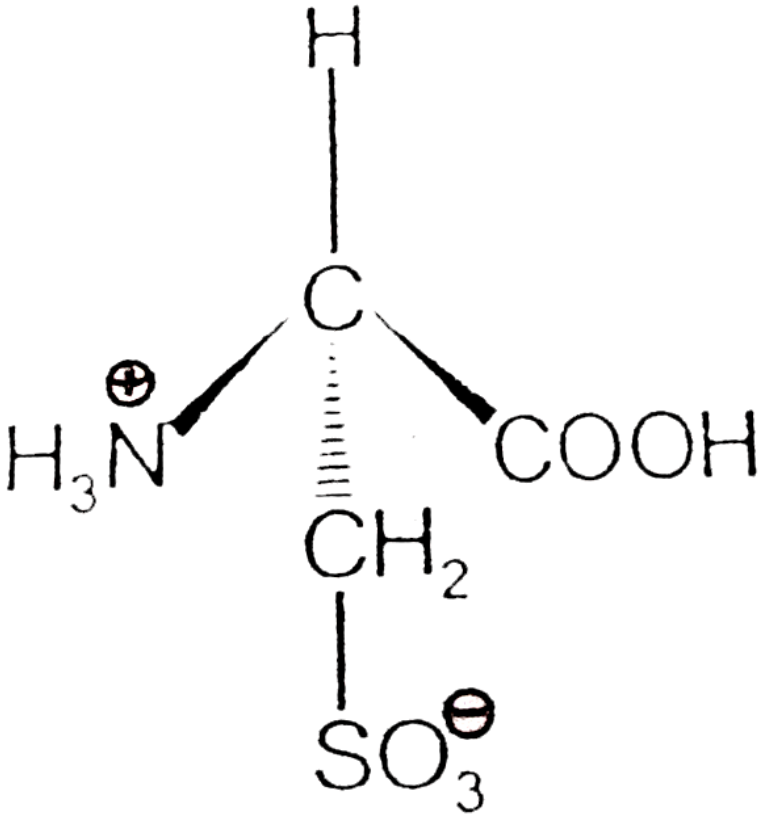
2. Which of the following statements would correctly describe the isoelectric point of cysteic acid an oxidation product of cysteine?



Cysteic acid

A. Lower than that of aspartic acid

B. About the same as that of aspartic acid

C. About the same as that of Cysteine

D. Higher than that of lysine

Answer: A

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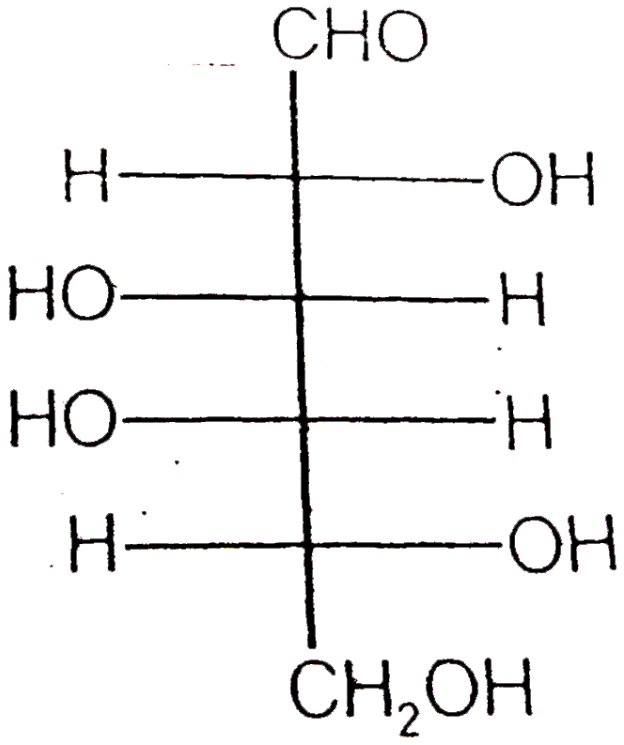
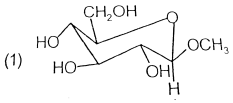
3. Which of the structures 1 through 4 is methyl α-D-galactopyranoside?



(D-galactose)

A.



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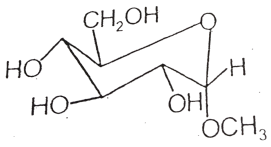

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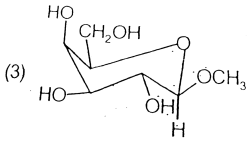
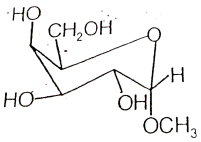


(4) 

D.

Answer: B

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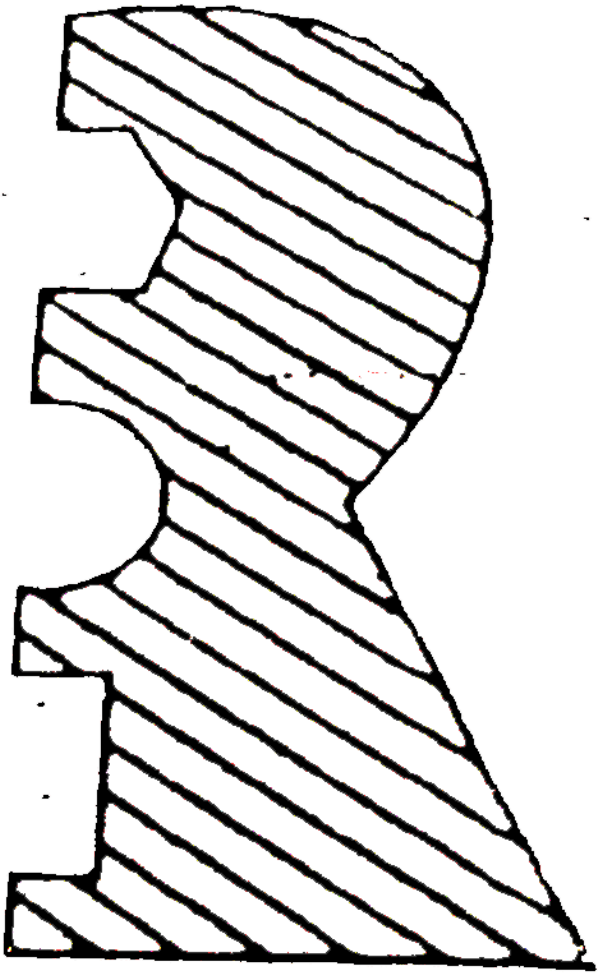
4. The active site of a biomolecule R is shown below



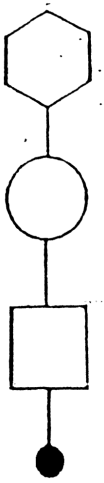
A biomolecule R

The biomolecule R binds to a tripeptide because its binding site is complementry to that of tripeptide. The shape of the tripeptide would be

Note : Complimentarity in the figure is shown by shape

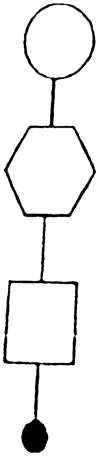
A.

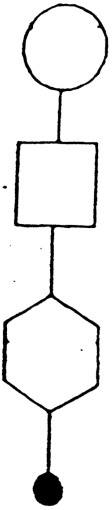
(1)

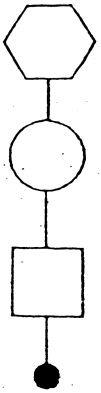


B.

(2)



C. (3) 

D. (4) 

Answer: D

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5. A mixture of three amino acids X-(pH = 3.2), Y-(pH = 5.7, and Z-(pH = 9.7) under electrophoresis at pH = 7.7, in which direction will each componeat of the mixture move?

A. X to anode, Y and Z to cathode

B. X to anode Y stationary, Z to cathode

C. X to cathode, Y stationary, Z to anode

D. X and Y to anode, Z to cathode

Answer: C

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Try Yourself

1. What is maximum number of monosaccharide unit present in oligosaccharides?

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2. In solution glucose exist in how many isomeric forms?

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3. Reducing sugars are

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4. Which is the most stable anomer of glucose?

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5. Give the name of two conjugated protiens.

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6. Essential amino acid is

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7. Give the name of two acidic amino acids.

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8. The enzyme present in saliva is

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9. Albinism is due to hereditary deficiency of enzyme

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10. Which enzyme converts urea into CO_2 and NH_3?

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11. Name the enzyme that catalyses maltose into glucose.

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12. Vitamin containing cobalt is

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13. The vitamins which is neither soluble in water nor in fat is

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14. Write the names of two water soluble vitamins.

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15. What is obtained by hydrolysis of nucleic acid?

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16. What type of sugar molecule is present in DNA ?

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17. Who gave the double strand helix structure of DNA?

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Exercise

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

A. Glucose

B. Sucrose

C. Maltose

D. Lactose

Answer: B

Watch Video Solution

2. Which of the following is the monomer of cellulose?

A. β-D-glucose

B. Amylose

C. Amylopectin

D. Glycogen

Answer: A

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3. Equimolar mixture of α-D(+)-glucose has specific $\left([\alpha]_D\right)$ is

A. -92.4°

B. $+112.5^\circ$

C. $+52.5^\circ$

D. -19.2°

Answer: C

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4. The number of chiral carbon in one molecule of α-D glucose is _____ .

A. 4

B. 6

C. 5

D. 3

Answer: C

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5. Presence of carbonyl group in glucose can be shown by its reaction with

A. NH_2OH

B. HCN

C. Tollen's reagent

D. All of these

Answer: D

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6. The main structural feature of proteins is:

A. Peptide linkage

B. Glycoside linkage

C. Ether linkage

D. All of these

Answer: A

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7. Which of the following α-amino acids is not optically active?

A. Alanine

B. Glycine

C. Phenylalanine

D. All are optically active

Answer: B

Watch Video Solution

8. The name of the dipeptide

A. Glycyl glycine

B. Glycyl Alaine

C. Glycine alanine

D. Alanyl glycine

Answer: D

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9. Peptides on hydrolysis give

A. Ammonia

B. Amines

C. Amino acids

D. Hydroxy acids

Answer: C

Watch Video Solution

10. Which of the following is a test for proteins?

A. Molisch's test

B. Beilstein test

C. Bluret test

D. Benedict's test

Answer: C

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11. Insulin is secreted by

A. Pancreas

B. Stomach

C. Thyroid

D. Adrenal medulla

Answer: A

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12. The enzyme that converts starch into maltose is called

A. Zymase

B. Maltase

C. Invertase

D. Amylase

Answer: C

Watch Video Solution

13. Conversion of urea to CO_2 and ammonia is done by

A. Pepsin

B. Urease

C. Lactase

D. Nuclease

Answer: B

Watch Video Solution

14. The enzyme pepsin hydrolyses

A. Fats to fatty acids

B. Proteins to α-amino acids

C. Starch to glucose

D. Glucose to ethyl alcohol

Answer: B

Watch Video Solution

15. Which of the following enzymes hydrolyses triglycerides to fatty acids and glycerol?

A. Amylase

B. Maitase

C. Lipase

D. Pepsin

Answer: C

Watch Video Solution

16. The chemical name of vitamin B_1 is

A. Ascorbic acid

B. Carotenoids

C. Thiamine

D. Pyridoxine

Answer: C

Watch Video Solution

17. Which of the following is fat soluble vitamin ?

A. A

B. B_6

C. B_{12}

D. B_1

Answer: A

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18. Milk contains vitamins :

A. A, D and E

B. A, B_{12} and D

C. C, D and K

D. B_1, B_6 and D

Answer: A

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19. The deficiency of vitamin K causes

A. Haemorrhage

B. Lengthening time of blood clotting

C. Inflammation of tung

D. Both (1) & (2)

Answer: D

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20. Which of the following if taken excessively can accumulate in body and cause toxicity?

A. Vitamin C

B. Vitamin D

C. Vitamin B_2

D. Vitamin K

Answer: B

Watch Video Solution

21. Which of the following is protozoal disease?

A. Mumps

B. Measeis

C. Syphilis

D. Malaria

Answer: D

Watch Video Solution

22. Pyrimidines of RNA are represented by :

A. Adenine and guanine

B. Thymine and uracil

C. Uracil and cytosine

D. Thymine and cytosine

Answer: C

Watch Video Solution

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

A. Thymine

B. Uracil

C. Adenine

D. Guanine

Answer: B

Watch Video Solution

24. The relationship between the nucleotide triplets and the amino acid is called.

A. Transcription

B. Duplication

C. Genetic code

D. Gene

Answer: C

Watch Video Solution

Exercise Assignment Section A Objective Type Questions

1. Which of the following is a reducing sugar?

A. Glycogen

B. Maltose

C. Sucrose

D. Starch

Answer: B

Watch Video Solution

2. Glucose reacts with HNO_3 to form

A. Gluconic acid

B. Saccharic acid

C. Sulphuric acid

D. Glyconic acid .

Answer: B

Watch Video Solution

3. Carbohydrate is a condensation polymer of

A. Amino acid

B. Nucleotides

C. Styrene

D. Simple sugars

Answer: D

Watch Video Solution

4. Glucose when reduced with HI and red phosphorus gives

A. n-pentane

B. n-butane

C. n-hexane

D. n-heptane

Answer: C

Watch Video Solution

5. Which of the following carbohydrates cannot be directly utilised by the human body as a source of energy?

A. Starch

B. Cellulose

C. Glycogen

D. All of these

Answer: B

Watch Video Solution

6. Which of the following is an essential amino acid?

A. Asparagine

B. Glutamine

C. Histidine

D. Alanine

Answer: C

Watch Video Solution

7. Which of the following amino acid is optically inactive?

A. Lysine

B. Glutamine

C. Serine

D. Glycine

Answer: D

Watch Video Solution

8. Rice is deficient in which of following essential amino acids?

A. Lysine

B. Leucine

C. Glycine

D. Alanine

Answer: A

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9. Deficiency of which of the vitamin in causes rickets?

A. Vitamin-D

B. Vitamin-C

C. Vitamin-B_{12}

D. Vitamin-E

Answer: A

Watch Video Solution

10. Water soluble vitamins are

A. Vitamin-C

B. Vitamin-D

C. Vitamin-A

D. Vitamin-K

Answer: A

Watch Video Solution

11. Glycosidic linkage is present in

A. Proteins

B. Lipids

C. Carbohydrates

D. Nucleic acids

Answer: C

Watch Video Solution

12. In which form carbohydrate is stored inside the human body?

A. Cellulose

B. Sucrose

C. Maltose

D. Glycogen

Answer: D

Watch Video Solution

13. $\alpha - D(+) -$ glucose and $\beta - D(+) -$ glucose are:

A. Anomers

B. Epimers

C. Enantiomers

D. All of these

Answer: A

Watch Video Solution

14. Which of the following is basic amino acid?

A. Lysine

B. Valine

C. Aspartic acid

D. Glycine

Answer: A

Watch Video Solution

15. Which of the following disaccharide consists only of glucose unit?

A. Sucrose

B. Maltose

C. Lactose

D. All of these

Answer: B

Watch Video Solution

16. Which of the following disaccharide in acidic medium is called invert sugar?

A. Lactose

B. Maltose.

C. Sucrose

D. All of these

Answer: C

Watch Video Solution

17. Which of the following component in starch is water insoluble?

A. Amylose

B. Glycogen

C. Amylopectin

D. Cellulose

Answer: C

Watch Video Solution

18. Which of the following carbohydrate is known as animal starch?

A. Cellulose

B. Amylose

C. Glycogen

D. Maltose

Answer: C

Watch Video Solution

Watch Video Solution

19. Antibodies are

A. Carbohydrates

B. Proteins

C. Lipids

D. Enzymes

Answer: B

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20. Tertiary structures of proteins is given as

A. α-helix

B. Fibrous

C. β-pleated

D. All of these

Answer: B

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21. Helical structure of protein is stabilised by

A. Peptide bonds

B. Hydrogen bonds

C. Dipeptide bonds

D. van der Waals forces

Answer: B

Watch Video Solution

22. Albumin is a type of

A. Fibrous protein

B. Globular protein

C. Lipid

D. Carbohydrate

Answer: B

Watch Video Solution

23. Glucose reacts with acetic anhydride to form

A. Diacetate

B. Hexa-acetate

C. Pentaacetate

D. Tetra-acetate

Answer: C

Watch Video Solution

24. Co is present in which of the following vilamin?

A. Vitamin-A

B. Vitamin-C

C. Vitarnin-B_{12}

D. Vitamin-D

Answer: C

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25. In DNA the complementary bases are

A. Uracil & Adenine : Cytbsine & Guanine

B. Thymine & Adenine : Guanine & Cytosine

C. Adenine & Thymine : Guanine & Uracil

D. Adenine & Guanine : Thymine & Cytosine

Answer: B

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26. Choose the correct statement about isoelectric point

A. If pH gt isoelectric point amino acid will move towards cathode

B. At this point amino acid is present in the form of Zwitter ion

C. If pH lt isoelectric point, amino acid will move towards anode

D. At this point amino acids are-basic in nature

Answer: B

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27. Amino acids are known to be bullding blocks of

A. Proteins

B. Nucleic acids

C. Carbohydrates

D. Vitamins

Answer: A

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28. Nucleotides is

A. A phosphoric acid group

B. A nitrogenous base

C. A pentose sugar

D. All of these

Answer: D

Watch Video Solution

29. DNA-directed synthesis of proteins occurs through

A. Transcription

B. Translation

C. Transformation

D. Both (1) & (2)

Answer: D

Watch Video Solution

30. The relation between nucleotide triplets and the amino acids is called as

A. Gene

B. Nucleoside

C. Genetic code

D. Gene pool

Answer: C

View Text Solution

31. Correct order of calorific value is

A. Carbohydrates gt Fats gt Proteins

B. Fats gt Carbohydrates gt Proteins

C. Proteins gt Carbohydrates gt Fats

D. Fats gt Proteins gt Carbohydrates

Answer: D

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32. The best solvent to remove butter stain from cloth is :

A. $CHCI_3$

B. C_2H_5OH

C. $C_2H_5OC_2H_5$

D. H_2O

Answer: C

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33. The commonest disaccharide has the molecular formula?

A. $C_{12}H_{22}O_{11}$

B. $C_{10}H_{20}O_{10}$

C. $C_{10}H_{16}O_9$

D. $C_{10}H_{32}O_{11}$

Answer: A

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34. Mutarotation is not seen in

A. Sucrose

B. D-Glucose

C. L-Glucose

D. All of these

Answer: A

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35. Mutarotation in aqueous solution is shown by

A. Glycogen

B. Sucrose

C. Cellulose

D. Maltose

Answer: D

Watch Video Solution

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

A. Acetic acid

B. α-amino ethanoic acid

C. Benzoic acid

D. Formic acid

Answer: B

Watch Video Solution

37. Branched chain structure is shown by

A. Amylopectin

B. Cellulose

C. Amylose

D. Nylon

Answer: A

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38. The number of amino acids required to form a tripeptide bond are

A. Seven

B. Two

C. Six

D. Four

Answer: D

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39. Glucose does not give

A. Schiff's test

B. Hydrogensulphite addition product with $NaHSO_3$

C. 2, 4 DNP test

D. All of these

Answer: D

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

A. Anomers

B. Enantiomers

C. Epimers

D. Metamers

Answer: A

Watch Video Solution

41. Glucose reacts with HCN to give

A. Saccharic acid

B. Cyanohydrin

C. n-hexane

D. Gluconic

Answer: B

Watch Video Solution

42. Cellulose is soluble in

A. Water

B. Organic solvents

C. Ammonical cupric hydroxide solution

D. All of these

Answer: C

Watch Video Solution

43. Glucose does not react with

A. NH_2OH

B. $C_6H_NHNH_2$

C. $NaHSO_3$

D. HCN

Answer: C

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44. Keratin in skin , hair, nails and wool is a

A. Fibrous protein

B. Carbohydrate

C. Glubular protein

D. None of these

Answer: A

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45. Which types of proteins undergo denaturation?

A. α-helix type

B. Globular

C. β- pleated types

D. Fibrous

Answer: B

View Text Solution

46. Cane sugar on hydrolysis gives

A. Fructose + Glucose

B. Fructose + Fructose

C. Glucose + Glucose

D. Glucose + Lactose

Answer: A

Watch Video Solution

47. Which is the correct statement?

A. Starch is polymer of α-glucose

B. Amylose is a component of cellulose

C. Proteins are composed of only one type of aminoacids

D. In cyclic structure of furanose, there are five carbons and one oxygen atom

Answer: A

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48. Enzymes in the living systems

A. Provide energy

B. Provide immunity

C. Transport oxygen

D. Catalyze biological reactions

Answer: D

Watch Video Solution

49. In the double helix structure of DNA, the base pairs are

A. Part of the backbone structure

B. Inside the helix

C. Outside the helix

D. Bonded with covalent bond

Answer: B

Watch Video Solution

50. Which of the following is not an α-amino acid?

A. Glycine

B. Alanine

C. Histidine

D. Benzidine

Answer: D

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Exercise Assignment Section B Objective Type Questions

1. The reagent which may be used to distinguish between cane sugar and glucose solution is

A. Molisch's reagent

B. Iodine solution

C. Baeyer's reagent

D. Fehling's solution

Answer: D

View Text Solution

2. Which pair is an example of anomers?

A. α-D-glucose and β-D-glucose

B. Glucose and mannose

C. Glucose and fructose

D. Fructose and sugar

Answer: A

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3. $\underset{\text{starch}}{2(C_6H_{10}O_5)_n} + H_2O \xrightarrow{\text{Distance}} nA \xrightarrow{H_2O} 2nB$

A and B in given sequence of reactions, respectively is

A. Maltose, D-Glucose

B. Lactose, D-Glucose

C. Sucrose, D-Glucose

D. Maltose, fructose

Answer: A

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4. Write structure of the product when glucose is oxidised with conc. Nitric acid.

A. $HOOC(CHOH)_4COOH$

B. $HOCH_2(CHOH)_4COOH$

C. $H_3\mathbb{C}H_2CH_2CH_2CH_2CH_3$

D. $HOCH_2(CHOH)_4CH = NOH$

Answer: A

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5. The reagent which forms crystalline osazone derivatives when heated with glucose is?

A. Fehling solution

B. Phenylhydrazine

C. Benedicts solution

D. Hydroxylamine

Answer: B

Watch Video Solution

6. Vitamin A is called:

A. Ascorbic acid

B. Retinol

C. Calciferol

D. Tocopherol

Answer: B

Watch Video Solution

7. Lactic acid on oxidation by alkaline potassium permanganate gives

A. Tartaric acid.

B. Cinnamic acid

C. Propionic acid

D. Pyruvic acid

Answer: D

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8. Select the correct statement

A. For exergonic reactions ΔG gt 0

B. ATP undergoes a three step hydrolysis

C. Conversion of ATP to ADP is highly endergonic reaction

D. Dark reactions do not proceed even on being coupled with hydrolysis of ATP

Answer: B

View Text Solution

9. Glucose on oxidation with Tollen's reagent cone. HNO_3 produces respectively

A. Gluconic acid and saccharic acid

B. Glucaric acid and saccharic acid

C. Saccharic acid and glucaric acid

D. Gluconic acid and no reaction

Answer: A

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10. A polypeptide on complete hydrolysis gives three amino acids. How many sequences are possible for A polypeptide on complete hydrolysis gives three amino acids. How many sequences are possible for that polypeptide?

A. 1

B. 3

C. 6

D. 9

Answer: C

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11. Which of the following is not a pyrimidine base?

A. Thymine

B. Cytosine

C. Uracil

D. Guanine

Answer: D

Watch Video Solution

12. Which of the following are fats soluble vitamins?

1) vit-A

2) vit-D

3) vit-H

4) vit-K

5) vit-C

A. Vitamin A

B. Vitamin K

C. Vitamin E

D. Vitamin H

Answer: D

Watch Video Solution

13. $\underset{(1\text{ mole})}{\text{Amino acid}} \xrightarrow[\Delta]{NaOH+CaO}$ gas evolved $\xrightarrow[\text{Lime water}]{\text{Pass in}}$ $\underset{0.1999kg}{\text{salt}}$

Amino acid having

A. Two NH_2 groups

B. One - COOH group

C. Two - COOH groups

D. Three - COOH groups

Answer: C

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14. Formation of 1° and secondary structure of proteins involves inkages

A. Peptide linkage, H-bond

B. H-Bond, disulphide bond

C. Disulphide bond, peptide linkage

D. H-bond, H-bond

Answer: A

View Text Solution

15. Which of the following ketone reduces Tollen's reagent in basic medium?

A. CH_3COCH_3

B. 

CH_2OH
|
$C = O$

C. |
$(CHOH)_3$
|
CH_2OH

CHO
|

D. $(CHOH)_4$
|
CH_2OH

Answer: C

View Text Solution

16. An optically active compound, having molecular formula $C_6H_{12}O_6$ is found in two isomeric forms. When isomers dissolved in water, they show the following equilibria

$$\underset{\alpha=111^n}{[A]} \Leftrightarrow \underset{52.5^\circ}{\text{equilibrium mixture}} \Leftrightarrow \underset{19.2}{[B]}$$

Such isomers are called

A. Anomers

B. Enantiomers

C. Positional isomers

D. Geometrical isomers

Answer: A

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17. Which of the following tests is not used for testing proteins :

A. Molisch's test

B. Biuret test

C. Ninhydrin test

D. Millon's test

Answer: A

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Exercise Assignment Section C Previous Years Questions

1. Which of the following statements is not correct?

A. Insulin maintains sugar level in the blood of a human body

B. Ovalbumin is a simple food reserve in eggwhite

C. Blood proteins thrombin and fibrinogen are involved in blood clotting

D. Denaturation makes, the proteins more active

Answer: D

View Text Solution

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

A. Amino acids $\rightarrow$ Proteins $\rightarrow$ DNA

B. DNA $\rightarrow$ Carbohydrates $\rightarrow$ Proteins

C. DNA $\rightarrow$ RNA $\rightarrow$ Proteins

D. DNA $\rightarrow$ RNA $\rightarrow$ Carbohydrates

Answer: C

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3. In a protein molecule various amino acids are linked together by :

A. Dative bond

B. α - glycosidic bond

C. β-glycosidic bond

D. Peptide bond

Answer: D

Watch Video Solution

4. Which one given below is a non $-$ reducing sugar ?

A. Sucrose

B. Maltose

C. Lactose

D. Glucose

Answer: A

Watch Video Solution

5. 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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6. Which of the following hormones is produced under the conditions of stress which stimulate glycogenolysis in the liver of human beings ?

A. Thyroxin

B. Insulin

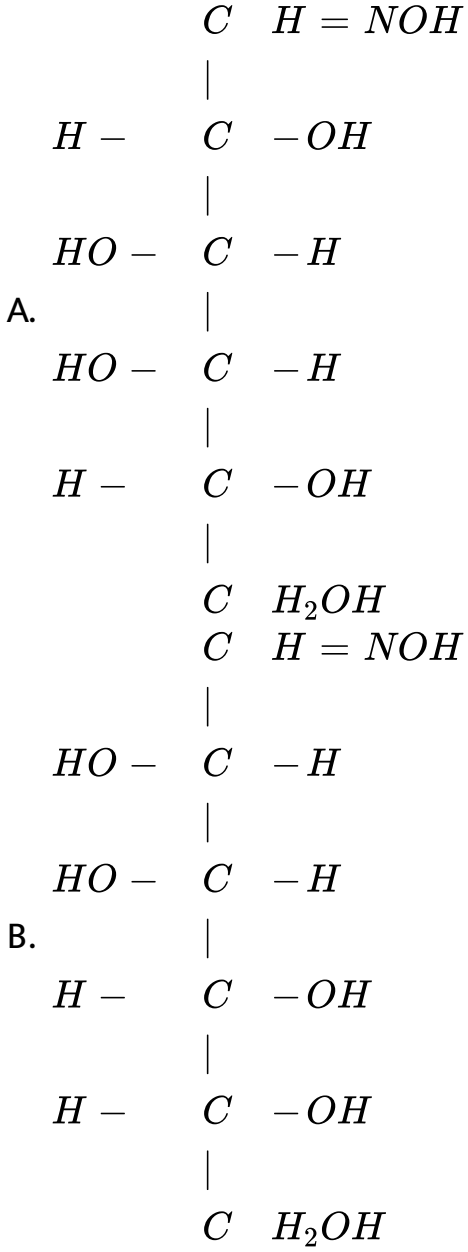
C. Adrenaline.

D. Estradiol

Answer: C

Watch Video Solution

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


C H = NOH
H − C − OH
HO − C − H
A.
HO − C − H
H − C − OH
C H2OH
C H = NOH
HO − C − H
HO − C − H
B.
H − C − OH
H − C − OH
C H2OH

$$
\begin{array}{lll}
 & C & H=NOH \\
 & | & \\
HO- & C & -H \\
 & | & \\
H- & C & -OH \\
 & | & \\
 & C & H_2OH
\end{array}
$$

C.

$$
\begin{array}{lll}
HO- & C & -H \\
 & | & \\
H- & C & -OH \\
 & | & \\
 & C & H_2OH \\
 & C & H=NOH \\
 & | & \\
H- & C & -OH \\
 & | & \\
HO- & C & -H \\
 & | & \\
H- & C & -OH \\
 & | & \\
H- & C & -OH \\
 & | & \\
 & C & H_2OH
\end{array}
$$

D.

Answer: D

Watch Video Solution

8. Deficiency of vitamin B_1 causes the disease

A. Cheilosis

B. Sterility

C. Convulsions

D. Beri-Beri

Answer: D

Watch Video Solution

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

A. β-D-Glucopyranose and α-D-fructofuranose

B. α-D-Glucopyranose and β-D-fructopyranose

C. β-D-Galactopyranose and β-D-Glucopyranose

D. α-D-Glucopyranose and β-D-fructofuranose

Answer: D

Watch Video Solution

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

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

B. On hydrolysis (+) Lactose gives equal amount of D(+) glucose and D(+) galactose

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

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

Answer: D

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11. Which of the statements about "Denaturation" given below are correct ?

(1) Denaturation of proteins causes loss of secondary and tertiary structures of the protein.

(2) Denaturation leads to the conversion of double strand of

DNA into single strand.

(3) Denaturation affects primary structure which gets distorted.

A. (a) &(b)

B. (a), (b)&(c)

C. (b) & (c)

D. (a)&(c)

Answer: A

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12. Which of the following is not a fat soluble vitamin ?

A. Vitamin'E

B. Vitamin A'

C. Vitamin B complex

D. Vitamin D

Answer: C

Watch Video Solution

13. Which one of the following does not exhibit the phenomenon of mutarotation ?

A. (+) Sucrose

B. (+) Lactose

C. (+) Maltose

D. (-) Fructose

Answer: A

Watch Video Solution

14. Fructose reduces Tollens' reagent due to :

A. Asymmetric carbons

B. Primary alcoholic group

C. Secondary alcoholic group

D. Enolisation of fructose followed by conversion to aldehyde by base

Answer: D

Watch Video Solution

15. The segment of DNA which acts as the instrumental manual for the synthesis of the protein is:

A. Ribose

B. Gene.

C. Nucleoside

D. Nucleotide

Answer: B

Watch Video Solution

16. Which of the following hormones contains iodine

A. Testosterone

B. Adrenaline

C. Thyroxine

D. Insulin

Answer: C

Watch Video Solution

17. 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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18. Which of the following is an amine hormone ?

A. Progesterone

B. Thyroxine

C. Oxypurin

D. Insulin

Answer: B

Watch Video Solution

19. Which one of the following vitamins is water-soluble?

A. Vitamin A

B. Vitamin B

C. Vitamin E

D. Vitamin K

Answer: B

Watch Video Solution

20. RNA and DNA are chiral molecules, their chirality is due to

A. D - sugar component

B. L-sugar component

C. Chiral bases

D. Chiral phosphate ester units

Answer: A

Watch Video Solution

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

$$\text{Proteins} \xrightarrow[(A)]{\text{enzyme}} \text{polypeptides} \xrightarrow[(B)]{\text{enzyme}} \text{amino acids}$$

A. Amylase and maltase

B. Diastase and lipase

C. Pepsin and trypsin

D. Invertase and zymase

Answer: C

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22. The human body does not produce:-

A. DNA

B. Vitamins

C. Hormones

D. Enzymes

Answer: B

Watch Video Solution

23. Which one of the following is a peptide hormone ?

A. Glucagon

B. Testosterone

C. Thyroxine

D. Adrenaline

Answer: A

Watch Video Solution

24. Cell membranes are mainly composed of :

A. Carbohydrates

B. Proteins

C. Phospholipids

D. Fats

Answer: C

Watch Video Solution

25. Which functional group participates in the disulphide bond formation in proteins?

A. Thiolactone

B. Thiol

C. Thioether

D. Thioester

Answer: B

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Exercise Assignment Section C Previous Years Questions Questions Asked Prior To Medical Ent Exams 2005

1. Which is not the correct statement about RNA and DNA?

A. DNA is active in virus while RNA never appears in virus

B. DNA exists as dimer while RNA is usually single stranded

C. DNA contains deoxyribose as its sugar and RNA contains ribose

D. RNA contains uracil in place of thymine (found in DNA) as a base

Answer: A

2. What is the nature of glucose-glucose linkage in starch that makes its so susceptible to acid hydrolysis?

A. Starch is hemiacetal

B. Starch is acetal

C. Starch is polymer

D. Starch contains only few molecules of glucose

Answer: B

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3. $\alpha - (D)$ glucose $\Leftrightarrow \beta - (D)$ glucose, equilibrium constant for this s 1.8. The percentage of $\alpha - (D)$ glucose at equilibrium is

A. 35.7

B. 55.6

C. 44.4

D. 64.3

Answer: A

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4. By the action of enzymes, the rate of biochemical reaction

A. Does not change

B. Increases

C. Decreases

D. Either (1) or (3)

Answer: B

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5. Secondary structure of proteins refers to

A. Regular folding patterns of contiguous portions of the polypeptide chain

B. Three-dimensional structure, specially the bond between amino acid residues that are distant from each other in the polypeptide chain

C. Mainly denatured proteins and structures of prosthetic groups

D. Linear sequence of amino acid residues in the polypeptide chain

Answer: A

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6. Total number of ATP molecules produced per glucose molecule in eucaryotic cell is

A. 28

B. 38

C. 12

D. 18

Answer: B

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7. Which of the following statements about enzymes are true?

A. Enzyme catalyse chemical reactions by lowering the activation energy

B. Enzymes are highly specific both in binding chiral substrates and in catalysing their reactions

C. Enzymes lack in nucleophilic groups

D. pepsin is proteolytic enzyme

Answer: B

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8. The $\alpha - D -$ glucose and $\beta - D -$ glucose differ from each other at one of the carbon atom due to difference in

A. Number of OH groups

B. Size of hemiacetal ring

C. Conformation

D. Configuration

Answer: D

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9. Haemoglobin is a/an

A. A vitamin

B. A carbohydrate

C. An enzyme

D. A globular protein

Answer: D

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10. The function of enzymes in the living system is to

A. Catalyse biochemical reactions

B. Provide energy

C. Transport oxygen

D. Provide immunity

Answer: D

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11. The number of ATP molecules produced in the lipid metabolism of a molecules of palmitic acid is

A. 56

B. 36

C. 130

D. 86

Answer: A

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12. Glucose molecule reacts with X number of molecules of phenylhydrazine to yield osazone. The value of X is

A. Two

B. One

C. Four

D. Three

Answer: D

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13. Which of the following is the sweetest sugar?

A. Fructose

B. Glucose

C. Sucrose

D. Maltose

Answer: A

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

A. Epimers

B. Anomer

C. Enantiomers

D. Diastereomers

Answer: B

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15. Which one is responsible for produce energy in bio reaction:

A. Thyroxine

B. Adrenaline

C. Oestrogen

D. Progesterone

Answer: A

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16. Mg is present in

A. Chlorophyll

B. Haemoglobin

C. Vitamin-D

D. Vitamin-B

Answer: A

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17. Which of following give positive Fehling solution test

A. Sucrose

B. Glucose

C. Fats

D. Protein

Answer: B

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18. Which of the following is correct about H-bonding in nucleotide?

A. A - T G - C

B. A - G T - C

C. G - T A - C

D. A - A T - T

Answer: A

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19. $-\overset{\overset{O}{||}}{C}-NH-(\text{peptide bond})$. Which statement is incorrect about peptide bond?

A. C - N bond length in proteins is longer than usual bond length of N - C bond

B. Spectroscopic analysis show planar structure of $-\underset{\underset{O}{||}}{C}-NH-(\text{group})$

C. C - N bond length in proteins is smaller than usual bond length of C - N bond

D. None of these

Answer: A

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20. Enzymes are made up of

A. Edible proteins

B. Proteins with specific structure

C. Nitrogen containing carbohydrates

D. Carbohydrates

Answer: A

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21. Which is not true statement?

A. α-carbon of α-amino acid is asymmetric

B. All amino acids are found in L-form

C. Human body can synthesize all amino acids they need

D. At pH = 7 both amino and carboxylic groups exist, in ionised form

Answer: C

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22. Vitamin B_{12} contains

A. Fe (II)

B. Co (III)

C. Zn (II)

D. Ca (II)

Answer: B

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23. Glycolysis is

A. Oxidation of glucose to glutamate

B. Conversion of pyruvate to citrate

C. Oxidation of glucose to pyruvate

D. Conversion of glucose to haem

Answer: C

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24. Phospholipids are esters of glycerol with

A. Three carboxylic acid residues

B. Two carboxylic acid residues and one phosphate group

C. One carboxylic acid residue and two phosphate groups

D. Three phosphate groups

Answer: B

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25. Chargaff' a rule states that in an organism:

A. Amount of adenine (A) is equal to that of thymine (T) and the amount of guanine (G) is equal to that of

cytosine (C)

B. Amount of adenine (A) is equal to that of guanine (G) and the amount of thymine (T) is equal to that of cytosine (C)

C. Amount of adenine (A) is equal to that of cytosine (C) and the amount of thymine (T) is equal to that of guanine (G)

D. Amounts of all bases are equal

Answer: A

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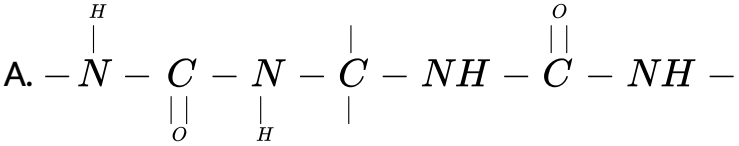
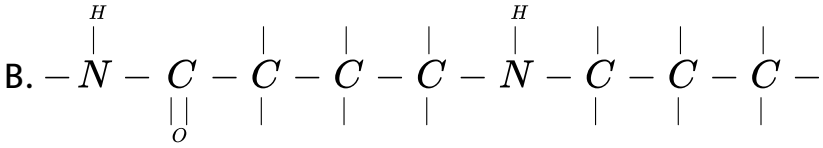
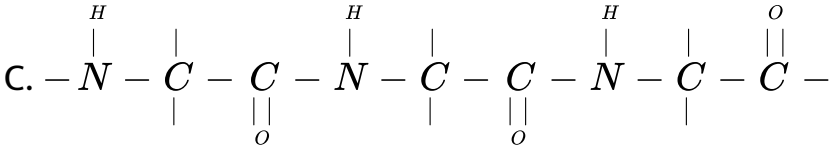
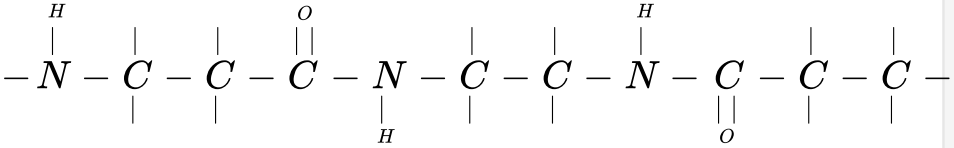
26. Which of the following structures represents the peptide chain?

A. 

B. 

C. 

D.



Answer: C

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27. A sequence of how many nucleotides in messenger RNA makes a condon for an amino acid

A. Three

B. Four

C. One

D. Two

Answer: A

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28. The hormone that helps in the conversion of glucose into glycogen is:

A. Cortisone

B. Bile acids

C. Adrenaline

D. Insulin

Answer: D

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29. The enzyme which hydrolyses triglycerides to fatty acid and glycerol is called:

A. Maltase

B. Lipase

C. Zymase

D. Pepsin

Answer: B

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30. The correct statement in respect of protein haemoglobin is that it

A. Functions as a catalyst for biological reactions

B. Maintains blood sugar-level

C. Acts as an oxygen carrier in the blood

D. Forms antibodies and offers resistance to diseases

Answer: C

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31. The number of chiral centres in D-(+)-glucose is

A. Five

B. Six

C. Three

D. Four

Answer: D

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32. The helical structure of protein is stabilised by:

A. Dipeptide bonds

B. Hydrogen bonds

C. Ether bonds

D. Peptide bonds

Answer: B

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

$$\text{Proteins} \xrightarrow[(A)]{\text{enzyme}} \text{polypeptides} \xrightarrow[(B)]{\text{enzyme}} \text{amino acids}$$

A. Invertase and zymase

B. Amylase and maltase

C. Diastase and lipase

D. Pepsin and trypsin

Answer: D

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Exercise Assignment Section D Assertion Reason Type Questions

1. A : Glucose and Mannose are Anomers.

R : Configuration at 1st carbon differ in Gluco& and Mannose.

A. If both Assertion and Reason are true and the reason is the correct explanation of the assertion, then mark (1).

B. If both Assertion and Reason are true but the reason is not the correct explanation of the assertion, then mark (2).

C. If Assertion is true statement but Reason is false, then mark (3).

D. If both Assertion and Reason are false statements, then mark (4).

Answer: D

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2. A : Glycine is the only amino acid which is optically inactive.

R : Glycine has no chiral carbon.

A. If both Assertion and Reason are true and the reason is the correct explanation of the assertion, then mark (1).

B. If both Assertion and Reason are true but the reason is not the correct explanation of the assertion, then mark (2).

C. If Assertion is true statement but Reason is false, then mark (3).

D. If both Assertion and Reason are false statements, then mark (4).

Answer: A

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3. A : Specific rotation of freshly prepared aqueous solution of α- D (+) glucose and β - D (+) glucose are same.

R : α - D (+) glucose and β - D (+) glucose are epimers.

A. If both Assertion and Reason are true and the reason is the correct explanation of the assertion, then mark (1).

B. If both Assertion and Reason are true but the reason is not the correct explanation of the assertion, then mark (2).

C. If Assertion is true statement but Reason is false, then mark (3).

D. If both Assertion and Reason are false statements, then mark (4).

Answer: C

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4. A : Glucose, Mannose and Fructose form identical osazone.

R : Glucose, Mannose and Fructose have identical configuration at 3rd, 4th and 5th carbon atom

A. If both Assertion and Reason are true and the reason is the correct explanation of the assertion, then mark (1).

B. If both Assertion and Reason are true but the reason is not the correct explanation of the assertion, then mark (2).

C. If Assertion is true statement but Reason is false, then mark (3).

D. If both Assertion and Reason are false statements, then mark (4).

Answer: A

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5. A : D-fructose is levorotatory

R : D-Glucose is dextrorotatory

A. If both Assertion and Reason are true and the reason is the correct explanation of the assertion, then mark (1).

B. If both Assertion and Reason are true but the reason is not the correct explanation of the assertion, then mark (2).

C. If Assertion is true statement but Reason is false, then mark (3).

D. If both Assertion and Reason are false statements, then mark (4).

Answer: B