CHEMISTRY

AAKASH INSTITUTE ENGLISH

BIOMOLECULES

Illustration

1. The rate constant for a first order reaction is $5.0 \times 10^{-4} s^{-1}$.If initial concentration of reactant is 0.080 M, what is the half life of reaction?

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Example

1. which of the following 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. The disease beri-beri is caused due to deficency of which vitamin?

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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 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. 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. Name the enzyme present in saliva.

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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 of the following is a water soluble vitamin?

(a) vitamin A

(b) vitamin B complex

(c) vitamin D

(d) vitamin E

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15. What is obtained by hydrolysis of nucleic acid?

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16. Name the pentose sugar present in DNA.

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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 one 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. (1) Proteins

B. (2) Lipids

C. (3) Carbohydrates

D. (4) 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 components of starch is water soluble ?

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. What is meant by tertiary structure of proteins?

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 vitamin?

A. Vitamin-A

B. Vitamin-C

C. Vitamin-B_{12}

D. Vitamin-D

Answer: C

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25. In DNA, the complimentary 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 the building 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 most common 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. (a) Seven

B. (b) Two

C. (c) Six

D. (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. (a) Anomers

B. (b) Enantiomers

C. (c) Epimers

D. (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 acid

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. Globular 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. (a) Fructose + Glucose

B. (b) Fructose + Fructose

C. (c) Glucose + Glucose

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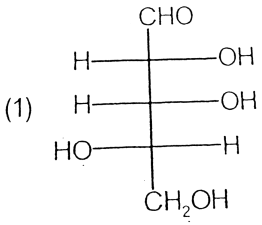
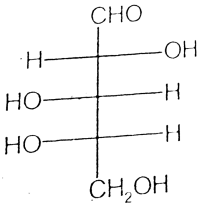
8. Which of the following gives an optically inactive aldaric acid on oxidation with dilute nitric acid ?

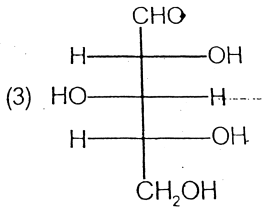
A.

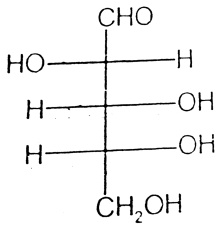


B.



C.



D. 

Answer: C

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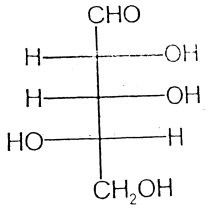
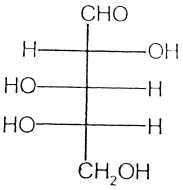
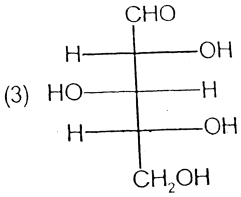
9. $(+)-$ Arabinose is $(2R, 3S, 4S)-$ aldopentose. Which of the following is $(+)$ arabinose ?

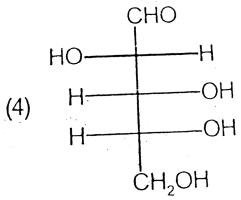
A. (1) 

B. (2) 

C.



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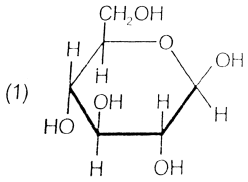
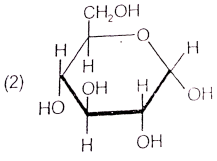
2. What would be the correct structure of $\beta - D -$ Glucose?

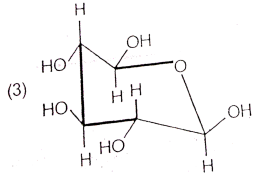
A.



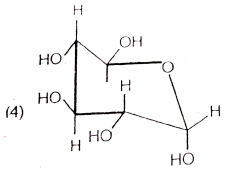
B.



C.



D.



Answer: A::C

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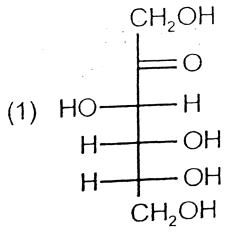
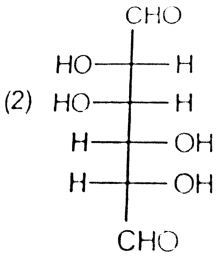
3. When D-Glucose reacts with three moles of phenylhydrazine it forms glucosazone. Which of the following carbohydrates will give some osazone as that of D-Glucose?

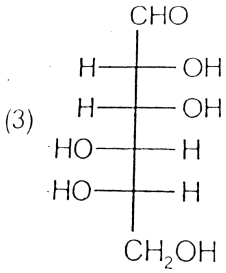
A.



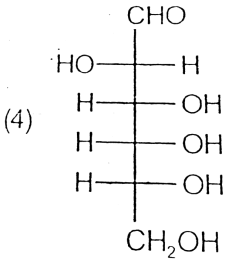
B.



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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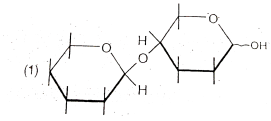
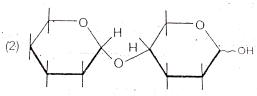
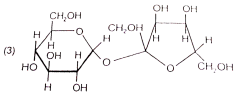
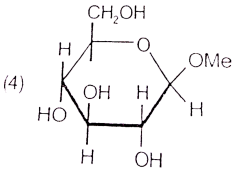
5. Which of the following sugars will form osazones?

A. 

B. 

C. 

D. 

Answer: A::B

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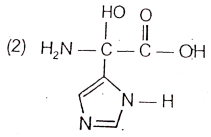
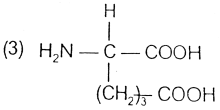
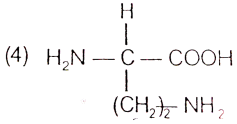
6. Which of the following amino acids will have +2 net charge at pH = 1?

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

B. 

C. 

D. 

Answer: B::D

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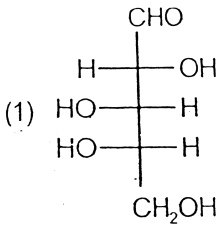
7. Which of the following aldoses will give achiral product with $NaBH_4$?

A. 

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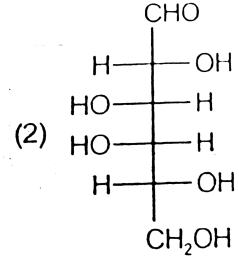

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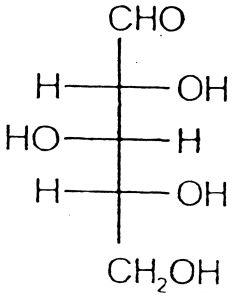

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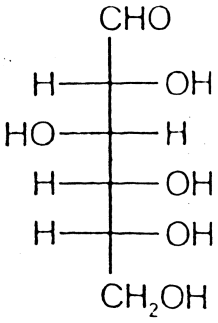

Answer: B::C

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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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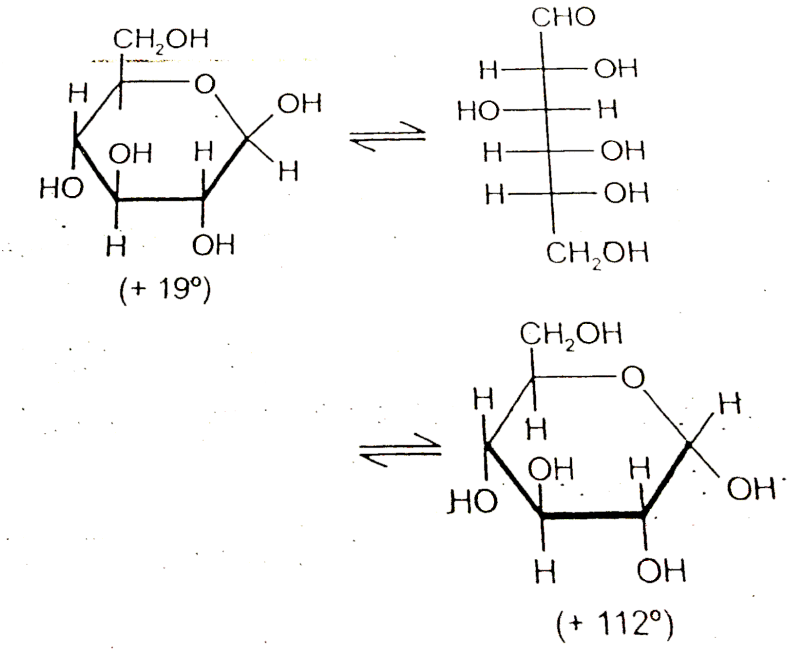
Section D Comprehension Questions

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-GIucose is more stable?

A. αD-Glucose

B. βD-Glucose

C. Open chain

D. All forms are equally stable

Answer: B

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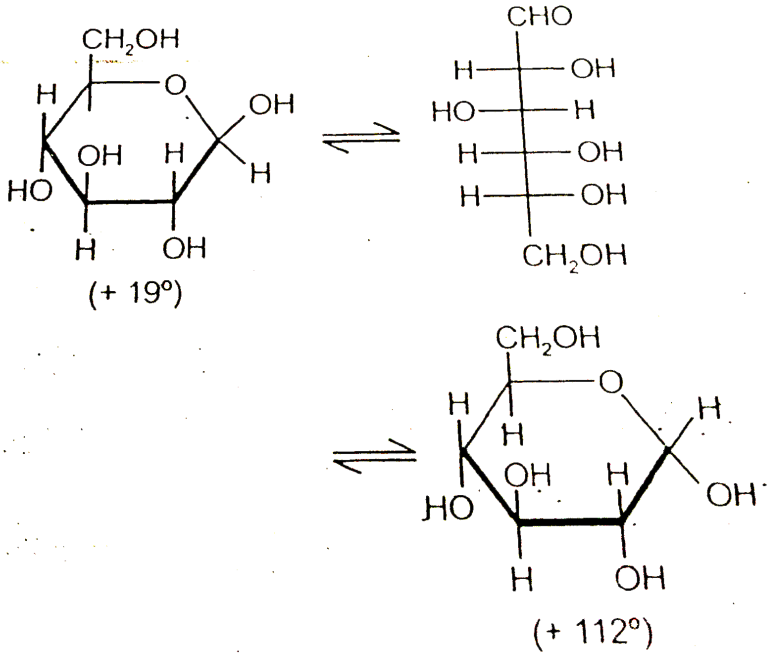
2. When either form of D-Glucose is dissolved In water, the solution gradually changes its optical rotation and finally attains a constant optical rotation of $+52^{\circ}$.



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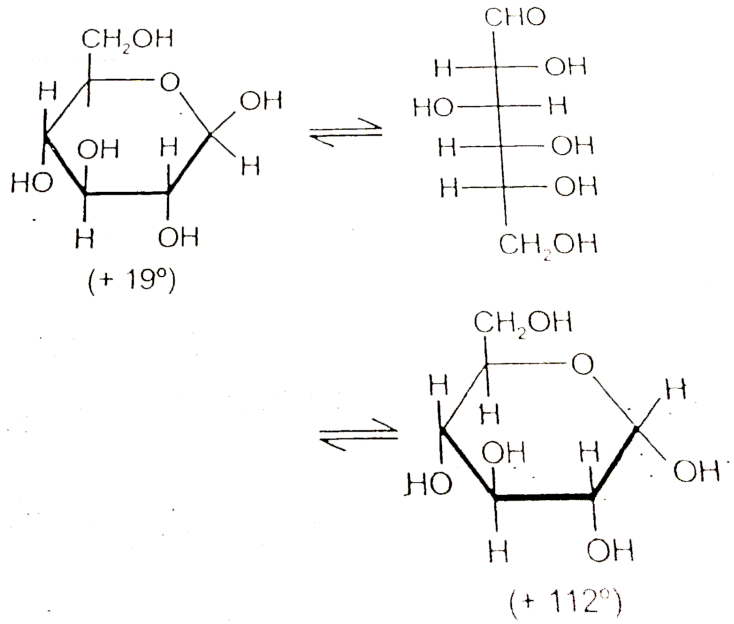
3. When either form of D-Glucose is dissolved In water, the solution gradually changes its optical rotation and finally attains a constant optical rotation of $+52^{\circ}$.



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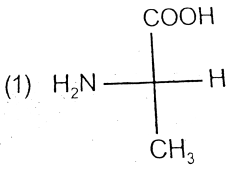
4. Carboxylic acids containing an amino group $(-NH_2)$ as a substituent are called amino acids. When this amino group substitution is at α position with respect to carboxylic group, the aminoacid is called α-amino acid. The aminoacids with two carboxylic acids are called acidic amino acids whereas aminoacids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



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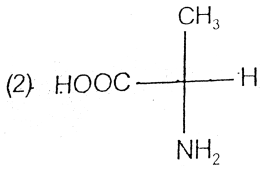

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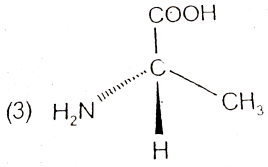
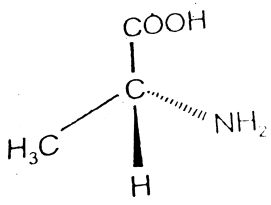


D.



Answer: D

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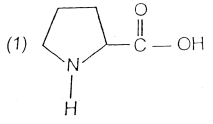
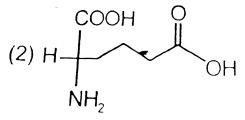
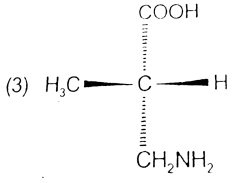
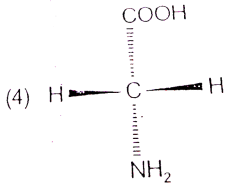
5. Carboxylic acids containing an amino group $(-NH_2)$ as a substituent are called amino acids. When this amino group substitution is at α position with respect to carboxylic group, the aminoacid is called α-amino acid. The aminoacids with two carboxylic acids are called acidic amino acids whereas aminoacids 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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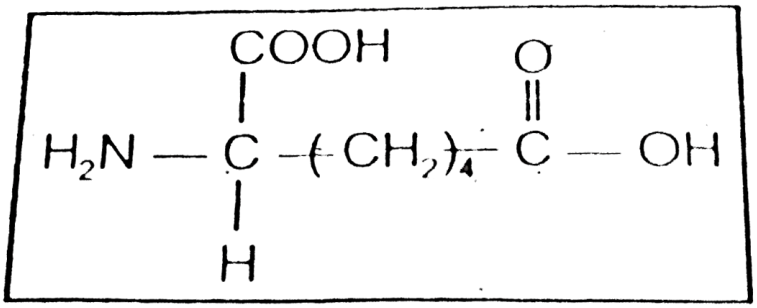
6. Carboxylic acids containing an amino group $(- NH_2)$ as a substituent are called amino acids. When this amino group substitution is at α position with respect to carboxylic group, the aminoacid is called α-amino acid. The aminoacids with two carboxylic acids are called acidic amino acids whereas 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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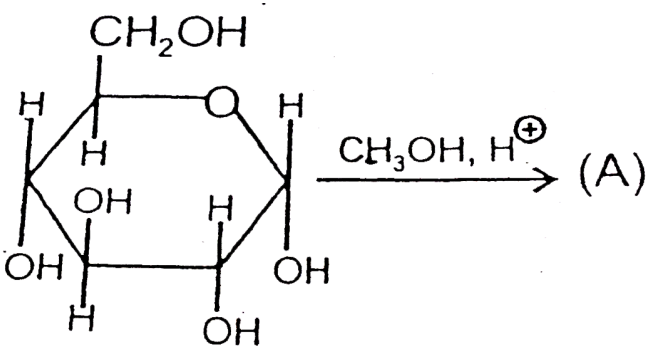
8. Aldehydes and ketones are converted to acetals by treatment with an alcohol and a trace of acid catalyst. These conditions also convert aldoses and ketoses to the acetals, call glycosides. In glycosides, an aglycone is the group bonded to the anomeric carbon atom.

Example : Methanol is the aglycone in a methyl glycoside.



A is

A. Methyl α-D-glucopyranoside, $\alpha -$ glycosidic bond

B. Methyl $\beta - D$-glucopyranoside,β-glycosidic bond

C. Methyl-β-D-glucopyranoside + methyl α-D glucopyranoside

D. No reaction can take place

Answer: C

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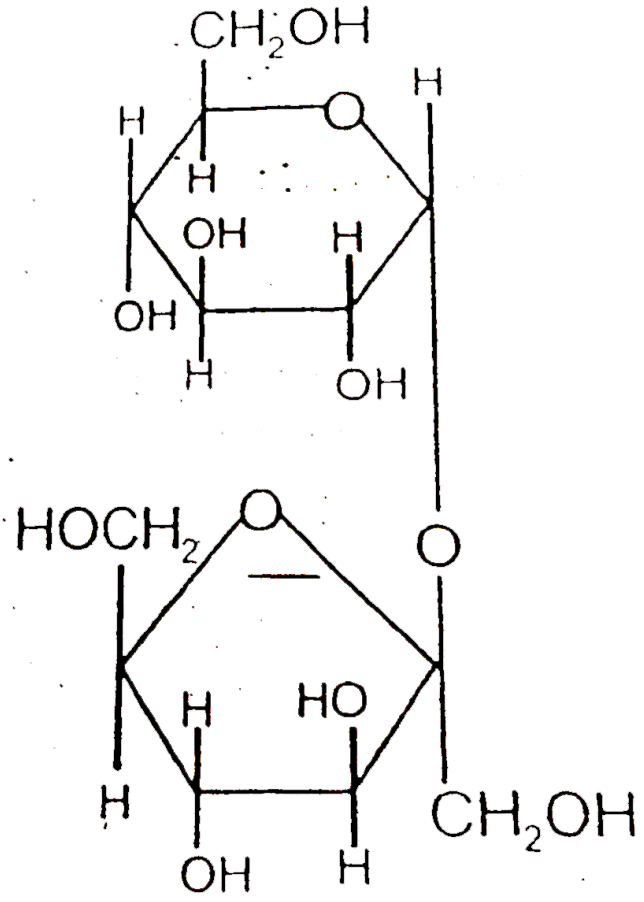
9. Aldehydes ahd ketones are converted to acetals by treatment with an alcohol and a trace of acid catalyst. These conditions also convert aldoses and ketoses to the acetals, call glycosides. In glycosides, an aglycone is the group bonded to the anomeric carbon atom.

Example : Methanol is the aglycone in a methyl glycoside.

In sucrose, two menosaccharides unit liked by



A. Only β-glycosidic linkage is present

B. Only α-glycosidic linkage is present

C. α-glycosidic linkage on glucose and β-glycosidic linkage on fructose

D. β-glycosidic linkage on fructose and α-glycosidic linkage on glucose

Answer: B

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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. The half life of a 1st order reaction is 1min 40 seconds. Calculate its rate constant.

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4. In a first-order reaction A→B, if k is rate constant and initial concentration of the reactant A is 0.5 M then the half-life is:

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5. The half-life period of a first order reaction having rate constant $k = 0.231 \times 10^{-10} s^{-1}$ will be:

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6. In a first-order reaction, the concentration of the reactant is reduced to 12.5% in one hour. Calculate its half-life.

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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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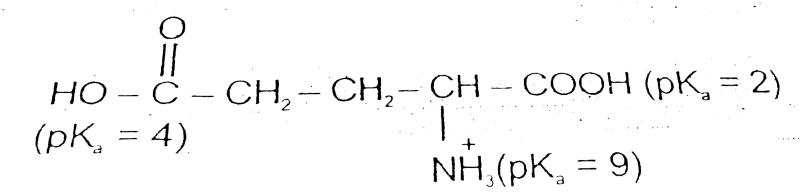
4. The iso-electric point of the given amino acid is,



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5. 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. [A] : Sucrose is a non reducing sugar .

[R] : It has glycosidic bonds .

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. The half-life for the reaction $N_2O_5 \rightarrow 2NO_2 + \frac{1}{2}O_2$ is 2.4 h at STP .

Starting with 10.8 g of N_2O_5 how much oxygen will be obtained after a period of 9.6 h

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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. The rate constant of a first order reaction is $1.54 \times 10^{-3} \sec^{-1}$. Calculate its half life period.

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6. Number of possible stereoisomers of glucose and fructose.

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Section J Aakash Challengers Question

1. For a first-order reaction; A → B, the reaction rate at a reactant concentration of 0.01 M is found to be $3.0 \times 10^{-5} molL^{-1}s^{-1}$. The half-life period of the reaction is:

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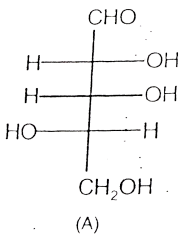
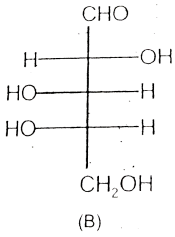
2. Which two of the following compounds are reduced to the chiral alditol by $NaBH_4$?



(A)



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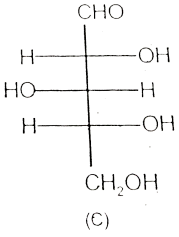
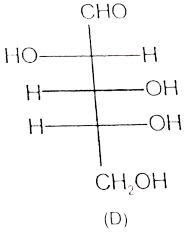


(C)



(D)

?

A. A & B

B. B & C

C. C & D

D. A & C

Answer: B

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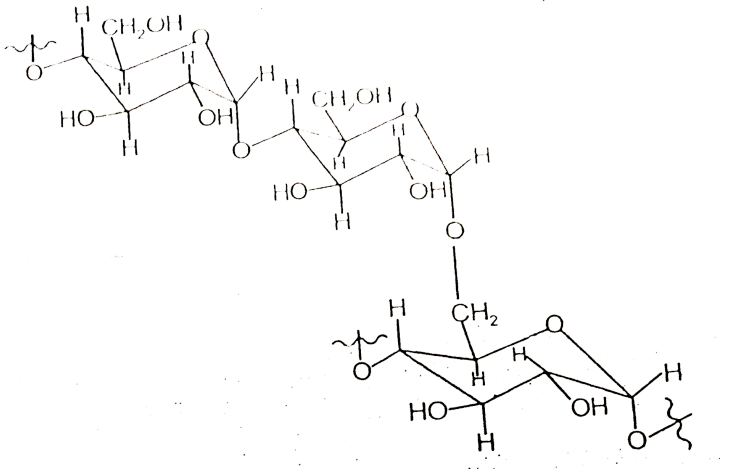
3. Starch consist of amylose and amylopectin structure of amylopectin is given as below



In a structure of amylopectin

A. β-1,4-glycosidic bonds

B. α-1,6-glycosidic bonds

C. α-1,4-glycosidic bonds

D. α-1,4-glycosidic bonds and α-1,6-glycosidic bonds

Answer: D

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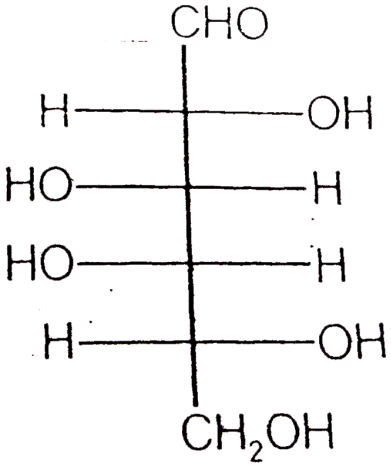
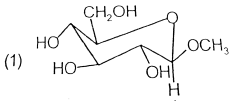
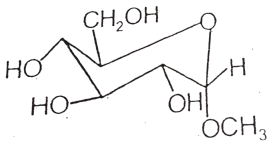
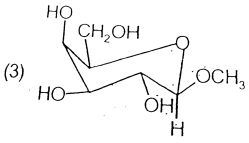
4. Which of the structures 1 through 4 is methyl α-D-galactopyranoside?

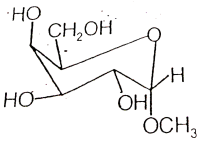


(D-galactose)

A. 

B. 

C. 

(4) 

D.

Answer: B

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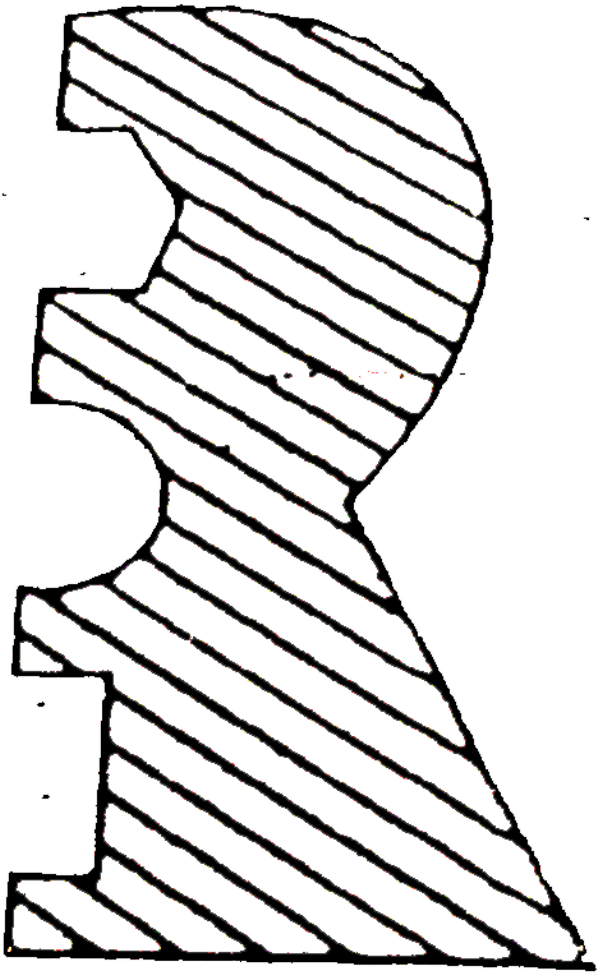
5. The active site of a biomolecule R is shown below



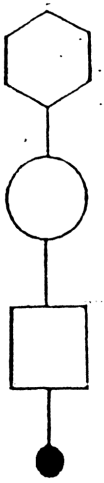
A biomolecule R

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

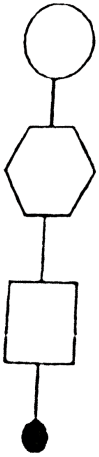
A.

(1)

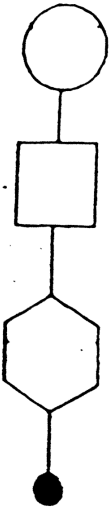


B.

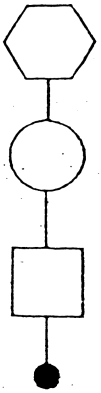
(2)



C. (3)



D. (4)



Answer: D

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6. 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?

Watch Video Solution

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

Watch Video Solution

3. Reducing sugars are

Watch Video Solution

4. Which is the most stable anomer of glucose?

Watch Video Solution

5. Give the name of two conjugated protiens.

Watch Video Solution

6. Essential amino acid is:

Watch Video Solution

7. Give the name of two acidic amino acids.

Watch Video Solution

8. Name the enzyme present in saliva.

Watch Video Solution

9. Albinism is due to deficiency of

Watch Video Solution

10. Which enzyme converts urea into CO_2 and NH_3?

Watch Video Solution

11. Name the enzyme that catalyses maltose into glucose.

Watch Video Solution

12. Which vitamin contains cobalt?

Watch Video Solution

13. If a vitamin is neither soluble in water nor in fat then what is it called?

Watch Video Solution

14. Give an example : A water-soluble vitamin

Watch Video Solution

15. What is obtained by hydrolysis of nucleic acid?

Watch Video Solution

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

Watch Video Solution

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

Watch Video Solution

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

Watch Video Solution

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

Watch Video Solution

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

A. 4

B. 6

C. 5

D. 3

Answer: C

Watch Video Solution

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

Watch Video Solution

6. The main structural feature of proteins is:

A. Peptide linkage

B. Glycoside linkage

C. Ether linkage

D. All of these

Answer: A

Watch Video Solution

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

Watch Video Solution

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. Biuret test

D. Benedict's test

Answer: C

Watch Video Solution

11. Insulin is secreted by :

A. Pancreas

B. Stomach

C. Thyroid

D. Adrenal medulla

Answer: A

Watch Video Solution

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. The enzyme which hydrolyses triglycerides to fatty acids and glycerol is called

(a) pepsin

(b) lipase

(c) maltase

(d) zymase

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 is a fat soluble vitamin?

A. A

B. B_6

C. B_{12}

D. B_1

Answer: A

Watch Video Solution

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

Watch Video Solution

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

Watch Video Solution

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. The pyrimidines of DNA 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 relation between nucleotide triplets and the amino acids is called as

A. Transcription

B. Duplication

C. Genetic code

D. Gene

Answer: C

Watch Video Solution

Exercise Assignment Section A Objective Type Questions

1. Which one 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. On reaction with red P + HI, glucose forms

A. n-pentane

B. n-butane

C. n-hexane

D. n-heptane

Answer: C

Watch Video Solution

5. Which of the following carbohydrate cannot be digested by human body?

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

A. Lysine

B. Leucine

C. Glycine

D. Alanine

Answer: A

Watch Video Solution

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. α-D(+)-glucose and β-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

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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

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 known as

A. Carbohydrates

B. Proteins

C. Lipids

D. Enzymes

Answer: B

Watch Video Solution

20. What is meant by tertiary structure of proteins?

A. α-helix

B. Fibrous

C. β-pleated

D. All of these

Answer: B

Watch Video Solution

21. The helical structure of proteins 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

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23. During acetylation of glucose it needs x moles of acetic anhydride. The value of x would be

A. Diacetate

B. Hexa-acetate

C. Pentaacetate

D. Tetra-acetate

Answer: C

Watch Video Solution

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

A. Vitamin-A

B. Vitamin-C

C. Vitarnin-B_{12}

D. Vitamin-D

Answer: C

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25. In DNA, the complimentary 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 the building 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

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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 for removing 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 most common 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

Watch Video Solution

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. Assertion:The two cyclic hemiacetal forms of glucose , α-form and β-form are called anomers.

Reason: Anomers differ only in the configuration of the hydroxyl group at C-1

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

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

Watch Video Solution

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

Watch Video 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 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

Watch Video 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 the structure of the product obtained when glucose is oxidised with nitric acid .1

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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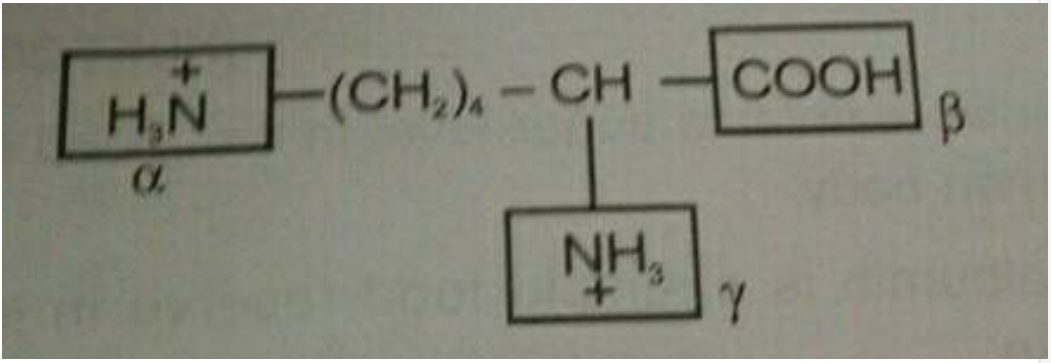
5.



pK_a of the sites α, β and γ are 10.79, 2.18 and 8.95 isoelectric point will be

A. 9.87

B. 5.07

C. 6.5

D. 2.18

Answer: A

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

A. Fehling solution

B. Phenylhydrazine

C. Benedicts solution

D. Hydroxylamine

Answer: B

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7. Vitamin A is called:

A. Ascorbic acid

B. Retinol

C. Calciferol

D. Tocopherol

Answer: B

Watch Video Solution

8. Lactic acid on oxidation by alkaline potassium permanganate gives

A. Tartaric acid.

B. Cinnamic acid

C. Propionic acid

D. Pyruvic acid

Answer: D

Watch Video Solution

9. 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

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10. 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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11. 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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12. Which one of the following is not a pyrimidine base?

A. Thymine

B. Cytosine

C. Uracil

D. Guanine

Answer: D

Watch Video Solution

13. 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

14. Allylic halides are

Watch Video Solution

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

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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16. 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

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17. Identify the functional groups in the compound: Methanol

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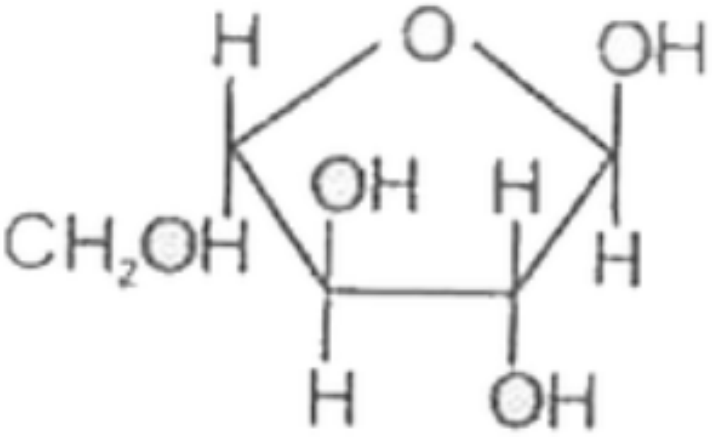
18. In the following structure of the carbohydrate which of the following are used while naming it?



A. Tetrose

B. Hexose

C. Aldose

D. Furanose

Answer: D

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19. 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

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

Such isomers are called

A. Anomers

B. Enantiomers

C. Positional isomers

D. Geometrical isomers

Answer: A

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20. 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

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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 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

 Watch Video Solution

6. Which of the following hormones is produced under the condition of stress which stimulates glycogenolysis in the lives of human beings ?

A. Thyroxin

B. Insulin

C. Adrenaline.

D. Estradiol

Answer: C

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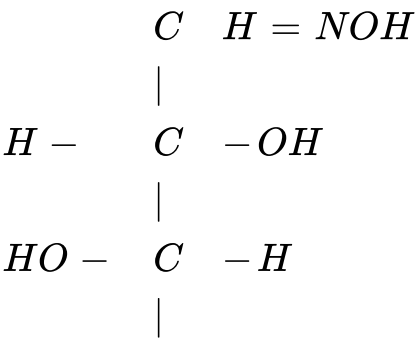
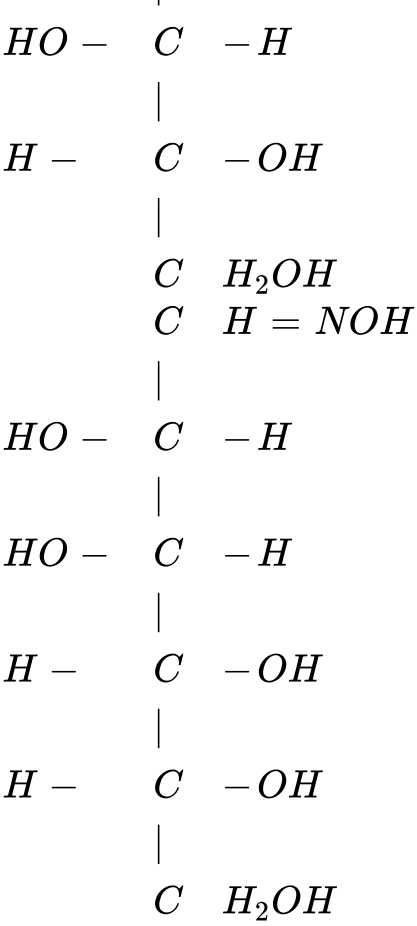
7. D-(+)-glucose reacts with hydroxyl amine and yields an oxime. The structure of the oxime would be

A.



B.



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

C.

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

D.

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

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

Answer: D

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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

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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

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

A. (+) Sucrose

B. (+) Lactose

C. (+) Maltose

D. (-) Fructose

Answer: A

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14. Fructose reduces Tollen's 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

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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

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16. Which of the following hormones contains iodine ?

A. Testosterone

B. Adrenaline

C. Thyroxine

D. Insulin

Answer: C

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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 one of the following is an amine hormone ?

A. Progesterone

B. Thyroxine

C. Oxypurin

D. Insulin

Answer: B

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

A. Vitamin A

B. Vitamin B

C. Vitamin E

D. Vitamin K

Answer: B

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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

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21. During the process of digestion , the proteins present in food materials are hydrolysed to amino acids.

The two enzymes involved in the process

proteins $\xrightarrow{\text{enzymes}(A)}$ polypeptides $\xrightarrow{\text{enzymes}(B)}$ amino acids.are respectively

A. Amylase and maltase

B. Diastase and lipase

C. Pepsin and trypsin

D. Invertase and zymase

Answer: C

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22. Which of the following is not produced by human body ?

A. DNA

B. Vitamins

C. Hormones

D. Enzymes

Answer: B

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

A. Glucagon

B. Testosterone

C. Thyroxine

D. Adrenaline

Answer: A

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24. The cell membranes are mainly composed of

A. Carbohydrates

B. Proteins

C. Phospholipids

D. Fats

Answer: C

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

(a)Thiolactone

(b)Thiol

(c)Thioether

(d)Thioester

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. The correct statement regarding RNA and DNA, respectively is

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

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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

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. Three of the following statements about enzyme are correct and one is wrong . Which one is worng ?

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. 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 molecules of ATP produced in the lipid metabolisms of a molecule of palmitic acid is

A. 56

B. 36

C. 130

D. 86

Answer: A

12. Glucose molecules reacts with 'X' number of molecules of phenyl hydrazine to yield osazone. The value of 'X' is

A. Two

B. One

C. Four

D. Three

Answer: D

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13. The sweetest sugar is

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 one of the following gives positive Fehling's solution test ?

A. Sucrose

B. Glucose

C. Fats

D. Protein

Answer: B

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18. Which of the following is correct statement 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. Explain 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 proteins are found in L-form

(c)Human body can synthesis all proteins they need

(d)At pH=7 both amino and carboxylic groups exist in ionised form

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)one carboxylic acid residue and two phosphate groups

(b)three phosphate groups

(c)three carboxylic acid residues

(d)two carboxylic acid residues and one phosphate group

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's rule states that in an organisms

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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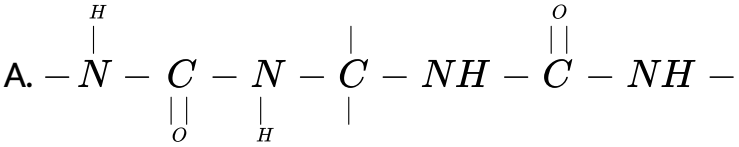
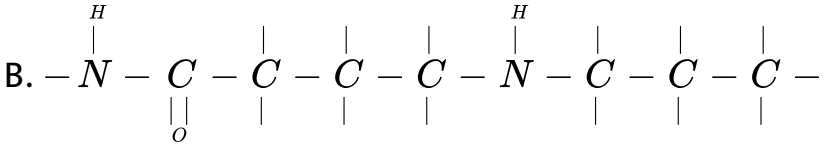
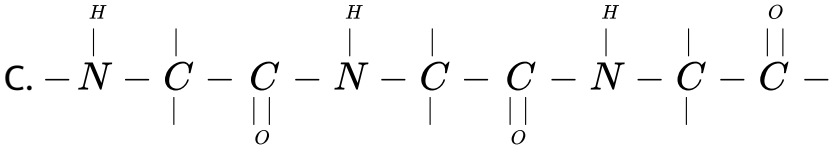
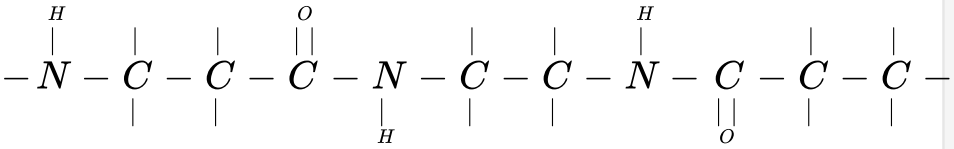
26. Which one of the following structures represents the peptide chain :-

A. 

B. 

C. 

D.



Answer: C

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

(a)Three

(b)Four

(c)One

(d)Two

A. Three

B. Four

C. One

D. Two

Answer: A

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

A. Cortisone

B. Bile acids

C. Adrenaline

D. Insulin

Answer: D

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

(a) pepsin

(b) lipase

(c) maltase

(d) zymase

A. Maltase

B. Lipase

C. Zymase

D. Pepsin

Answer: B

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30. The correct statement in respect of proteins 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. α-helical structure of protein is stabilized 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 materials are hydrolysed to amino acids.

The two enzymes involved in the process

proteins $\xrightarrow{\text{enzymes}(A)}$ polypeptides $\xrightarrow{\text{enzymes}(B)}$ amino acids.are respectively

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

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

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: Glycinate Ion is an unsymmetrical bidentate ligand

R: Glycinate ion is a conjugate base of glycine.

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

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. Glucose, Mannose and fructose give identical osazones. Explain

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

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

A. If both Assertion and Reason are true and 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

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